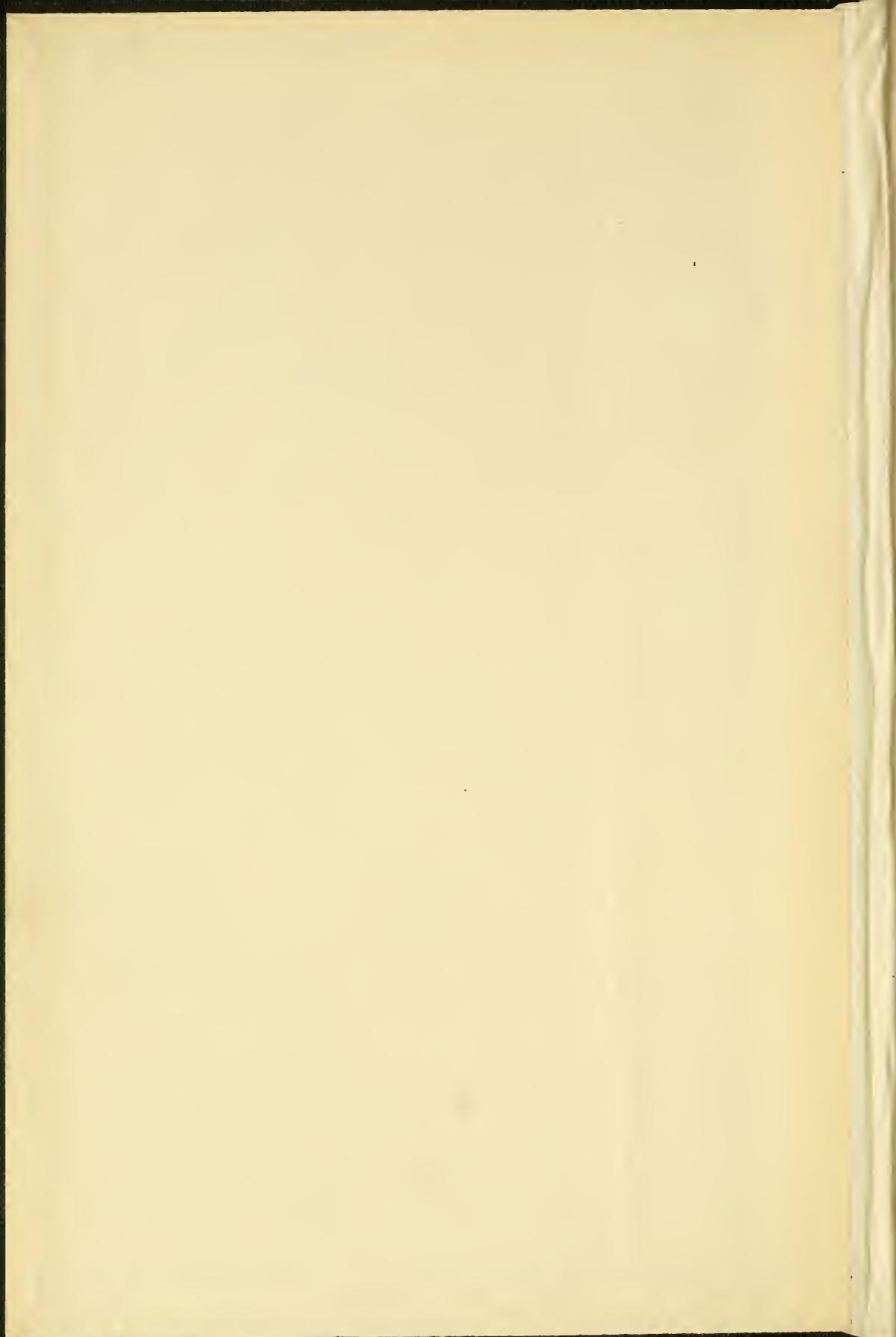


UNIV. OF
TORONTO
LIBRARY



Canadian Forestry Journal

Vol. XIII: XIV

JANUARY, 1918 - December 1918

No. 13

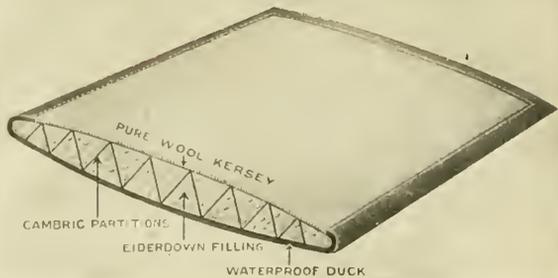


"Topping" a Douglas Fir at a Height of 181 Feet.

Foresters, Attention!

Have You Ever Seen
a Robe Like This
Before?

Note the Pure Wool
Kersey Lining—the
Cambric Partitions
that contain the Eider-
down Filling and the
Waterproofed "High
Count" Shelter Tent



Duck.— A great combination—absolutely frost-proof—light as a
feather and lasting almost until the end of time. You need one—you
should have one. *Send us your name for further information.*

Smart-Woods, Limited

OTTAWA
TORONTO
MONTREAL
WINNIPEG

THE UNIVERSITY OF TORONTO

AND

UNIVERSITY COLLEGE

WITH WHICH ARE FEDERATED

VICTORIA, TRINITY, ST. MICHAEL'S
KNOX and WYCLIFFE
COLLEGES

FACULTIES OF

ARTS

APPLIED SCIENCE

MEDICINE

EDUCATION

HOUSEHOLD SCIENCE

FORESTRY

For further information, apply to the Registrar of the University,
or to the Secretaries of the respective Faculties.

CIRCULATION, JANUARY, 6,700 COPIES

Canadian Forestry Journal

Vol. XIII

WOODSTOCK, ONT., JANUARY, 1918

No. 13

CONTENTS FOR JANUARY

Wood Fuel to Relieve Coal Shortage in Eastern Canada	1473
Wood Fuel Problems Demand Solution	1477
Rising Value of Farm Woodlots	1498
Canada's Foresters Overseas	1487
The Forest Resources of the McKenzie Basin	1481
Loaning Money on Limits	1494
Aeroplane Fleets from British Columbia Woods	1479
Will Alberta Reduce Needless Fire Losses?	1492
Taking Food from Forest Trees	1500
About British Columbia	1497
Immigration after the War	1501
Can Forests be Planted at a Profit?	1501
The Annual Meeting at Montreal, Feb. 6, 7	1492

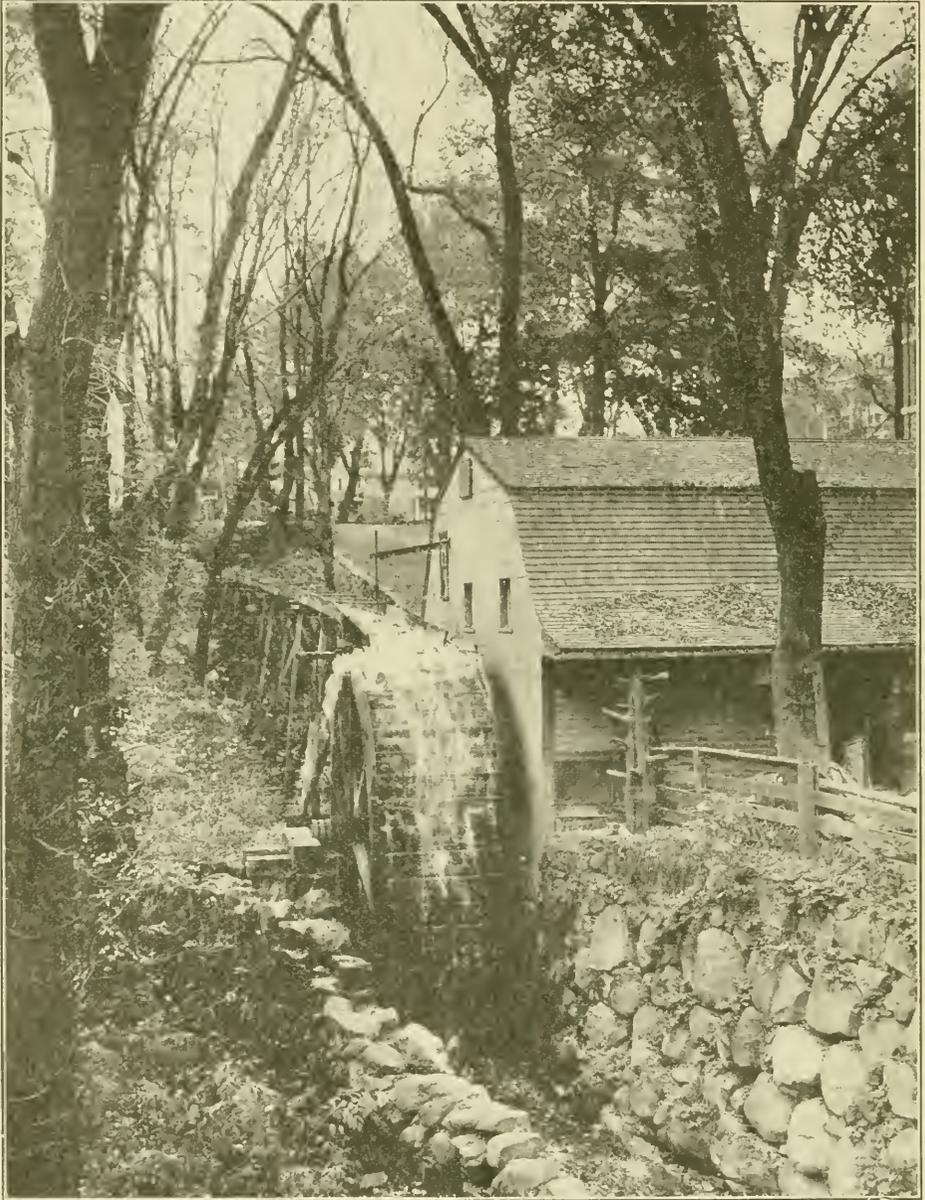
The Canadian Forestry Journal will be sent to any address for one dollar a year, subscription including all other publications of the Canadian Forestry Association.

Address all Communications to

THE CANADIAN FORESTRY JOURNAL
119 BOOTH BUILDING, OTTAWA

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

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



Courtesy "Sunshine"
An Old Time Mill near Montreal. A Witness To Canada's More Primitive Days.

Wood Fuel to Relieve Coal Shortage in Eastern Canada

BY CLYDE LEAVITT, CHIEF FORESTER, COMMISSION
OF CONSERVATION

SUMMARY

Eastern Canada is mainly dependent upon United States supplies for coal.

War conditions have resulted in an acute shortage of coal production and distribution in the United States, which, in turn, has caused a series of fuel crises in eastern Canada.

The demands for coal for local industrial and domestic uses in the United States are so heavy that exports to Canada and other countries must necessarily be carefully checked and regulated.

There is, to say the least, serious doubt as to whether the coal situation in eastern Canada can improve materially during the continuance of the war, due primarily to the labor and transportation shortages and to the enormously increased demand for coal for war purposes.

As long as such doubt exists, prudence demands that all reasonable precautions be taken to mitigate the disastrous results that might follow from an acute shortage of coal supplies.

The most urgent considerations of patriotism demand that the local consumption of coal be reduced as much as possible, to facilitate the preparation of troops, munitions and food supplies and their movement overseas, from both United States and Canadian ports.

A vigorous campaign for the conservation of coal supplies is being waged in the United States. Canada can surely do no less.

The consumption of coal can be considerably reduced through the wider use of wood fuel, of which Canada has enormous supplies.

On the other hand, the production of wood fuel has been seriously curtailed, due largely to the serious labor shortage.

The production of large quantities of hardwood fuel is essential to meet the situation.

To stimulate such production, and to increase the demand for wood fuel to the necessary degree will require a vigorous campaign of education, coupled with specific and well-organized effort on the part of provincial, city and municipal governments.

This is a question of preparedness, and results may be expected to be commensurate only with the effort exerted.

THE FAMINE IN WOOD

There has been almost or quite as great a famine of wood as of coal in many of the towns and cities of eastern Canada. This condition is anomalous, to say the least, in a country naturally so rich in timber resources.

Under normal conditions, the demand for wood fuel is relatively small, due to the greatly increased use of coal for nearly all fuel purposes. The severe coal shortage has, however, resulted in greatly increasing the demand for wood fuel. That the supplies of wood in fuel form have at many points been grossly inadequate to meet the increased demand may be at least partially accounted for by the following considerations:

(1) The universal labour shortage, with consequent high cost of such labour as may be available. This renders it both difficult and expensive to convert standing timber into fuel form. The labor shortage has been due primarily to the heavy enlistments including large numbers of axemen and other woods workers, for forestry battalions and other branches of overseas service.

(2) The uncertainty as to how long the emergency demand for large quantities of wood fuel will continue. There is a more or less natural tendency on the part of many people to be optimistic and to assume that an existing emergency will not be repeated. Dealers, in many cases, feel that Government control of the rail ways in the United States will solve the problem of coal distribution to such an extent that a coal famine next winter is extremely unlikely, to say the least. They argue that if such should prove to be the case, the emergency demand for wood fuel will disappear, prices will drop, and dealers having large reserve supplies might face heavy loss. Accordingly, while dealers for the most part do the best they can to secure supplies to meet current demands, they are, in many cases, naturally disinclined to invest amounts adequate to ensure the laying up of supplies of wood fuel sufficient to meet the situation in case of an extreme and prolonged shortage

of coal. This consideration is intensified by the fact that wood fuel supplies ought to be laid in from six months to a year ahead of time, to ensure proper seasoning. Properly seasoned wood has, of course, a fuel value materially higher than green wood.

Need for Education

The fact that good authorities believe that the fuel situation will continue to be more or less critical throughout the duration of the war does not entirely remove the element of doubt as to how great will be the demand for wood fuel in particular localities. The point has not, however, been adequately considered that the demand for wood fuel can be very materially stimulated by an educational campaign urging people, as a patriotic measure, as well as one of prudence and necessity, to substitute wood fuel for coal so far as reasonably practicable. This action is now being taken in a systematic and thorough way in many of the states, under the Federal and State Fuel Administrations.

(3) Coal is more convenient than wood for most fuel purposes, in addition to being as cheap or cheaper, the relative fuel values being taken into consideration. The demand for wood fuel is thus limited under normal conditions. According to the United States Forest Service, two pounds of seasoned wood have a fuel value equal to one pound of coal. On this basis, a standard cord (4 x 4 x 8 feet, or 128 cubic feet) of hardwoods, such as birch, beech and hard maple, equals one ton of anthracite coal. One and a half cords of hemlock, soft maple or tamarack, or two cords of spruce, balsam, cedar, white pine or basswood are required to make the same equivalent.

(4) In localities where sawmills exist, a considerable percentage of the local demand for wood fuel is supplied by mill waste, consisting of slabs and edgings. Some of this material is of hardwood, such as beech, birch and maple, but more often it is comprised of coniferous species, such as spruce, balsam, pine,

etc. The production of this class of material is, at present, considerably below normal, because of the prevailing depression in the lumber business, which has resulted in many mills working only part time or closing down altogether. This relative stagnation is due to war conditions which have materially decreased the amount of building. It has also been intensified by the prevailing shortage of railway equipment, which has made it difficult to secure transportation. The car shortage has also had the effect of preventing, to a considerable extent, the shipment of mill waste to points where a demand might exist for it for fuel purposes. The amount of mill waste available for fuel has been further limited by the utilization, in some cases, of spruce and balsam slabs and edgings in the manufacture of pulp.

(5) Many dealers, who formerly dealt heavily in wood, now give this feature of their business comparatively little attention, preferring to concentrate upon the handling of coal. In the case of the latter, the financial turnover is quicker than in the wood business, and the demand is more steady and more dependable. Current business is, of course, handled, but there is less inclination to tie up investments for the long periods of time that would be required to allow the proper seasoning of block wood.

The Farmer's Attitude

(6) In ordinary times, very considerable quantities of block wood are cut by farmers from their woodlots during the winter. Under present

conditions, however, farmers in general are faced with a severe shortage of labor, which renders them less able than formerly to cut firewood for sale during the winter months. In addition there is less necessity for such action on their part, since war conditions have resulted in bringing to them better returns for their crops than has previously been the case under normal conditions.

(7) Very large quantities of cordwood are consumed annually by chemical companies for destructive distillation and the manufacture of charcoal. This demand materially reduces the supplies that would otherwise be available for domestic use and is at the same time a factor in holding prices to a relatively high level.

(8) The increasing settlement of the country, together with the cutting which has previously taken place, has naturally reduced the amount of wood conveniently accessible to transportation by team or rail. This is notably the case in the vicinity of the larger towns and cities where the demand for fuel is necessarily greatest. This means that taking the situation as a whole it is constantly necessary to go further and further away for an increasing proportion of the supplies of hardwood fuel needed for consumption in the larger towns and cities. This situation renders it more essential than formerly that if a large production of wood fuel is desired there should be special attention on the part of some particular organization to see that the action desired is taken on a commensurate scale.

Canada's Dependence Upon U. S. Coal

Eastern Canada can not afford to overlook the fact that a very considerable proportion of her coal supplies must come from mines which are situated in the United States, and over a considerable mileage of United

States railways. The coal shortage of the United States has been officially estimated to be not less than 50,000 - 000 tons. Federal and state fuel administrations have been appointed to assist toward solving the very

serious problems which have resulted from this great shortage in the production of coal. The demands for coal for industrial purposes directly due to the war are very heavy, and may be expected to increase greatly. Demands for export are also heavy, as well as the demands for local domestic use. Very good authorities consider that the coal shortage will continue throughout the duration of the war, and that this situation will continue to affect Canada as seriously in the future as it has in the past, if not more so. The amount of coal which will be allowed to be furnished to specific localities or specific industries will presumably be limited, through the various fuel controllers in both the United States and Canada. As a matter of fact, the fuel problem is world-wide today. In England, France and Italy, the coal shortage is so great that the rationing system has had to be adopted. It is reported that in the latter country the coal supply has been so short that during last summer more than 1,000 square miles of forests were cut down for use as fuel and for making charcoal. In Sweden also the coal shortage has become so serious that the Government forestry organization has been compelled to cut great quantities of timber for use as fuel.

Using Our Forest Materials

In view of the extreme seriousness of the coal shortage in most of the countries of the world, and of the opinion of those who ought to know, that the condition will remain more or less critical throughout the war the obvious thing for Canada to do is to consider how far her great forest resources may be utilized to meet the conditions which may possibly face at least the eastern portion of the country during next winter.

Canada may well take a lesson from the situation in the New England States. The Federal Fuel Administrator for New England, Mr. J. J. Storrow in a call for a conference on the subject, said:

"A serious shortage of coal threatens New England this winter.

The situation does not warrant neglecting any possible measure of preparedness. For this reason it seems advisable to make a New England campaign for the production of wood on a large scale. Good hardwood properly prepared and dried can be used extensively for domestic purposes as an emergency measure. Wood cut in November can be burned the latter part of the winter, when the coal situation may be most acute. The campaign should also look ahead toward a large supply of wood for next winter when the coal situation may be more serious than this year."

A Practical Programme

The full attendance at the conference bespoke the interest of everyone in the solution of the fuel problem and conclusions reached were summarized as follows:

1. People throughout New England should be urged to use wood wherever they can do so in order to save coal.

2. It is earnestly recommended that the fuel administrators and the agricultural and other officers throughout the New England states shall urge upon all woodland owners to cut cordwood promptly and extensively.

3. As far as possible portable sawing machinery should be used in order to save the expense of additional handling. In some instances the wood can probably be cut into one foot lengths advantageously. The machinery uses a different class of laborers, reducing the number of skilled laborers required.

4. In order to secure the best results, local organization is necessary. Leadership and sometimes capital are required, which we believe should come from the local banks and business men.

5. It is recommended that the fuel administrator in each state shall appoint a representative committee from the several counties and wood-using industries, including the State Forester in each state, these committees to take charge of the wood situation under the fuel administrator. Insofar as their judgment approves, local

Wood Fuel Problems Demand Solution

How Coal and Wood Compare as Fuel —Prices You Can Afford To Pay.

The question of an increased supply of wood fuel for the Canadian people has never before called so imperatively for full discussion and sensible action.

Canada brought 17,500,000 tons of coal from the United States in 1916 and month after month of the coldest season was filled with anxieties, increasing prices, and not a little actual suffering.

The winter of 1917, even with the aid of the Fuel Controller, and generous co-operation by the United States Government, has provided an experience through which most householders, particularly in Ontario, do not care to pass again. In the emergency, questions have naturally been raised as to the need for Canada facing an annual dilemma in the presence of great supplies of hardwood timber in woodlots and the natural forest. Regrettable as it may seem that practically nothing has been done until recent months to investigate the possibilities of a wood fuel reserve and to devise means of connecting the wood supply with the wood consumer, there is hope that something of a practical nature will be accomplished before next winter. To this end, the Commission of Conservation, through Mr. Clyde Leavitt, Chief Forester, has been working with the Fuel Controller. Mr. Leavitt's plan, which will be found in the leading article of this issue, promises one of the most reasonable solutions that has yet been offered and ought to receive the support of municipal authorities everywhere.

Wood and Coal Compared

How does the heating power of wood compare with that of anthracite coal?

One standard cord of well-seasoned hickory, oak, beech, birch, hard

maple, ash, elm, is approximately equal to one ton (2,000 pounds) of anthracite coal. It takes a cord and a half of hemlock, red gum, sycamore or soft maple and two cords of cedar, poplar, spruce, white pine or basswood, however, to give the same amount of heat.

One cord of mixed wood well seasoned equals in heating value at least one ton (2,000 pounds) of average-grade bituminous coal.

The table shows the price which the consumer can afford to pay for a cord of wood as the equivalent of anthracite coal at various prices.

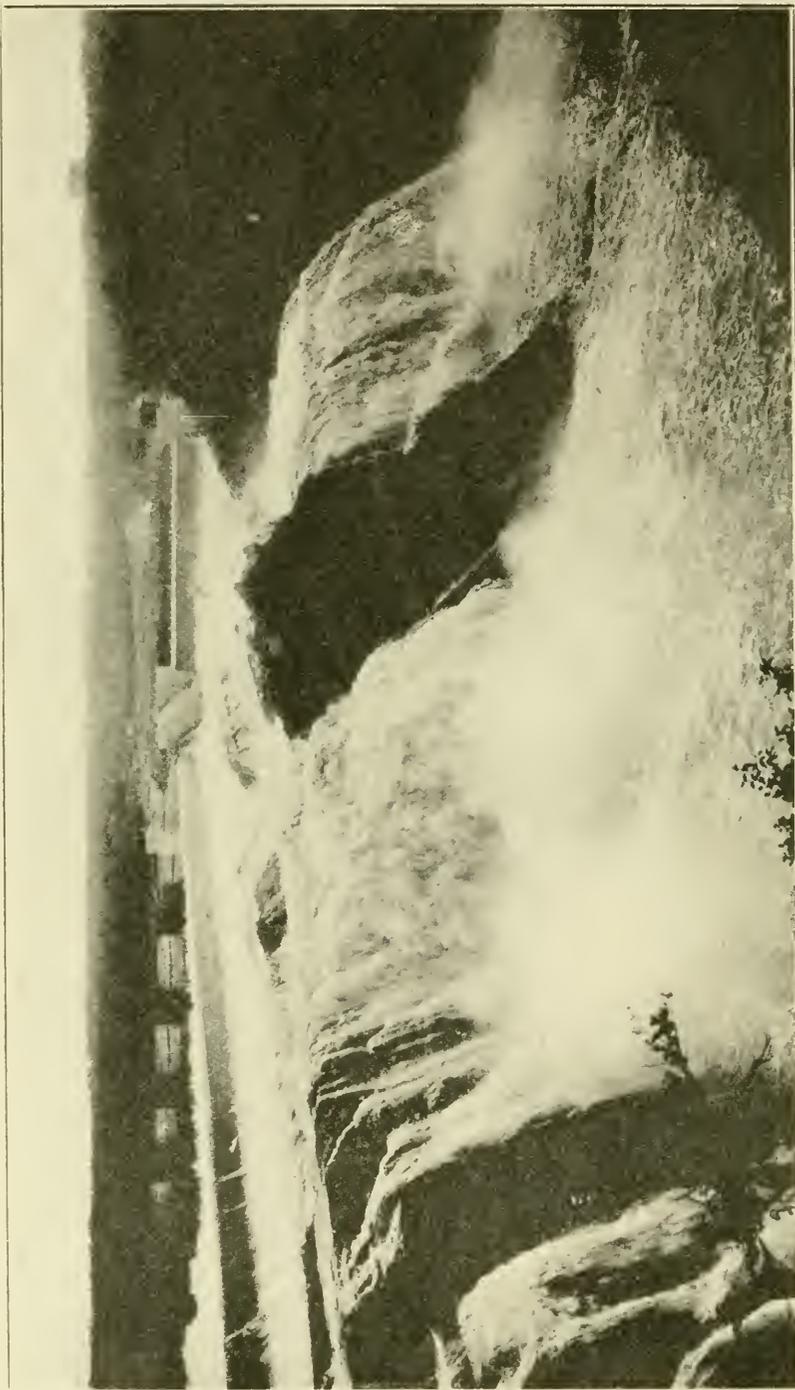
Prices which the consumer can afford to pay for wood as a substitute for coal.

Equivalent price for wood delivered in 16 inch stove lengths.

Price of coal delivered		
Per ton	Per Cord.	Per Cord.
5.00	5.00	2.50
6.00	6.00	3.00
7.00	7.00	3.50
8.00	8.00	4.00
9.00	9.00	4.50
10.00	10.00	5.00
11.00	11.00	5.50
12.00	12.00	6.00

Coal Cheaper to Buy

On January 15, a cord of beech, birch and maple was quoted in Ottawa at \$11.00, or \$11.75 cut in 16 inch lengths. This price prevailed quite commonly in Ontario cities and the Eastern Townships of Quebec, although even at the above prices good wood was often not procurable. Anthracite coal was quoted on the same date at Ottawa as \$10.50 a ton, so that, counting fuel value alone, and without regard to convenience, the coal was the cheaper purchase.



Courtesy "Sunshine"

THE FALLS OF THE CHAUDIERE

A View of the Splendid Water Power That Furnishes Energy to Many Great Industries at Ottawa.

Aeroplane Fleets From B. C. Spruce

Only 15 Per Cent. of a Log Can
Be Used For Flying Machine.

Canada's forestry battalions rather than her forest materials have thus far contributed the greatest service in the winning of the war. This has been due, of course, to the inability of the Imperial authorities to spare ships for the bulky cargoes of timber, preferring to make a slaughter of the Old Country woodlands and a heavy inroad upon the forests of France at the hands of practical Canadian woodsmen.

Recently, the resources of the Canadian forest itself have had to be drawn upon to facilitate the building of aeroplanes. Under the arrangements of the Imperial Munitions Board, which has extended its field from shell making to shipbuilding and finally to aeroplane factories, an effort is being made to secure a minimum of 150,000,000 feet of spruce from British Columbia in order to supply a fleet of aircraft adequate for the battles of the coming spring.

Eastern Spruce Little Used

Not all spruce is aeroplane spruce, as the "Pacific Lumberman" points out. Neither is every spruce log a recruit for the aeroplane army nor much of any log suitable for the work. In Canada aeroplane manufacturers have depended to a slight extent upon spruce from the east for meeting the demands, but this supply is extremely limited and meets the demands only as to the shorter lengths.

Sitka spruce, which grows on the Pacific coast from Oregon to Alaska, is the type of spruce that best meets the demands for aeroplane construction. It has all the requisites for that purpose and to a much greater degree than spruce, as it grows in any other part of the world. Hence the force of the appeal of the Imperial Munitions authorities to British Columbia interests to get busy and get out the required spruce.

For the Wing Beam

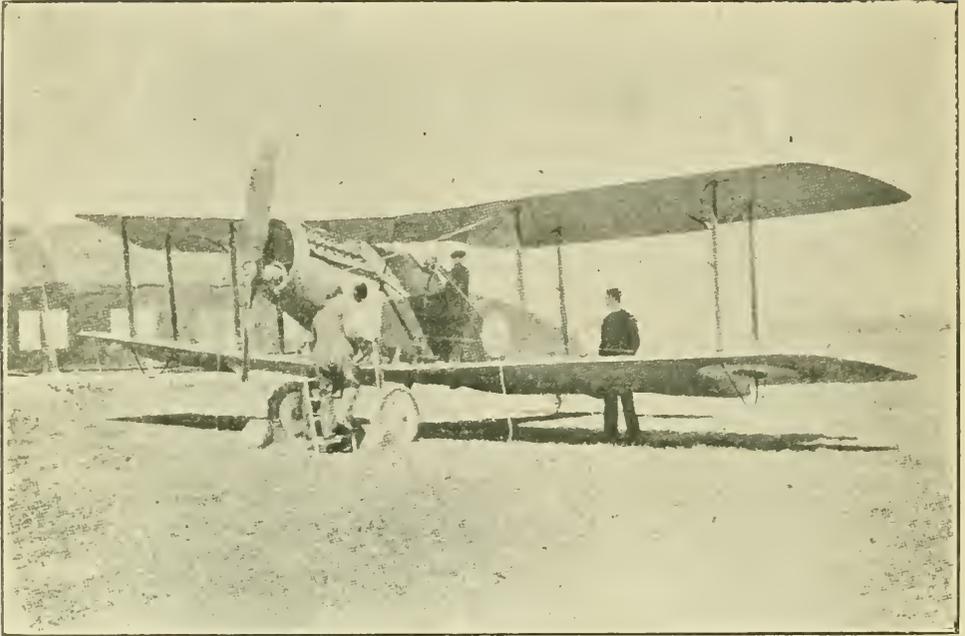
One of the most important parts of an aeroplane is the wing beam, for which, as now constructed, long spruce is required. It is here that the Sitka spruce just meets the demands and it is claimed that on this coast there is an ample abundance of trees which will turn out spruce suitable for aeroplane manufacture, giving the required length of 18 feet demanded for the wing beam.

The actual amount of spruce, worked down, required for an aeroplane such as is used for training purposes, is about 125 feet. For the larger aeroplanes, such as are used at the front, the demands for each are from five to six times that amount.

When the Imperial Munitions Board first began to secure spruce from British Columbia it was purchased on G list specifications. As the difficulties of transportation and tonnage have multiplied, the Board has been forced to demand clear spruce only. The reason for this course is shown when it is stated that from 2500 feet it is possible to obtain only 360 feet of clear. As the cost of transport from the coast is \$125 per M, the Board was forced to establish the policy of purchasing only clears, coming strictly up to the required specification as ascertained by its official inspector.

Only 15% of a Log

It is stated that the percentage of a spruce log suitable for aeroplane use, averages about 15 per cent. of the log, although it may run in some cases as high as 20 per cent. This means, of course, the production of a large amount of ordinary spruce and many millmen claim that there is not a sufficient demand for this to warrant them in utilizing their forces and equipment in turning out the pro-



A "Bristol Fighter" aeroplane of the Rolls-Royce type, now being used at the front. 190 horse power engines.

portionately small output which will pass inspection for aeroplane use.

That the situation is one which demands consideration is admitted by the Munitions authorities, and, to meet it, the Imperial Board is paying around \$125 per M for aeroplane spruce. At this price it is claimed the spruce can be got out and any possible danger of loss because of a surplus of side lumber be fully met.

B. C. the Only Source

The Imperial Board is practically tied up to British Columbia as its source of supplies, as the U. S. Aeroplane Board is now taking all the available spruce on that side of the line. Before the U. S. joined the Allies a certain amount of aeroplane spruce was received from that source, but purchases of this character have now ceased as the result of agreements between the Imperial and U. S. authorities.

The Imperial Munitions Board is now carefully going into the problem of developing the spruce resources of British Columbia to meet the pressing

demands of the case. Major Taylor has been sent from the east to take charge of the work, and he is now operating in the province with Vancouver as his headquarters. Mr. H. R. McMillan, formerly Canadian Timber Commissioner, who is thoroughly acquainted with the forest problems of the province, acting as his assistant.

TAKING FOOD FROM FOREST

Many people like the fruit of the shad bush, "sarvice" berry, or June berry, as it is variously called. In parts of the country this fruit is used to make jelly.

The French Canadians are said to use the acid flowers of the redbud, or Judas tree, in salads, while the buds and tender pods are pickled in vinegar. Honey locust pods, often locally called "honey-shucks," contain a sweetish, thick, cheese-like pulp which is often eaten.

—("Forest Leaves")

Forests of the McKenzie Basin

BY H. J. BURY, CHIEF TIMBER INSPECTOR,
DEPARTMENT OF INDIAN AFFAIRS, OTTAWA

An Interesting Estimate of the Timber Contents of 630 Million Acres of the Far North.

It is a common impression that the timber resources of the lands included in the drainage basin of the McKenzie River and its tributaries are not extensive and in consequence little attention is directed to a consideration of them.

It is true that comparatively little exploitation of the forest wealth of this large territory has been undertaken owing to lack of transport facilities but that is no reason why we should not take stock of the quantity of timber with a view to the safe-guarding of the forests during the present time and the adoption of effective administration in the near future.

The McKenzie river is 2525 miles in length and has a drainage area of approximately one million square miles, being the seventh largest drain-

age basin in the world.

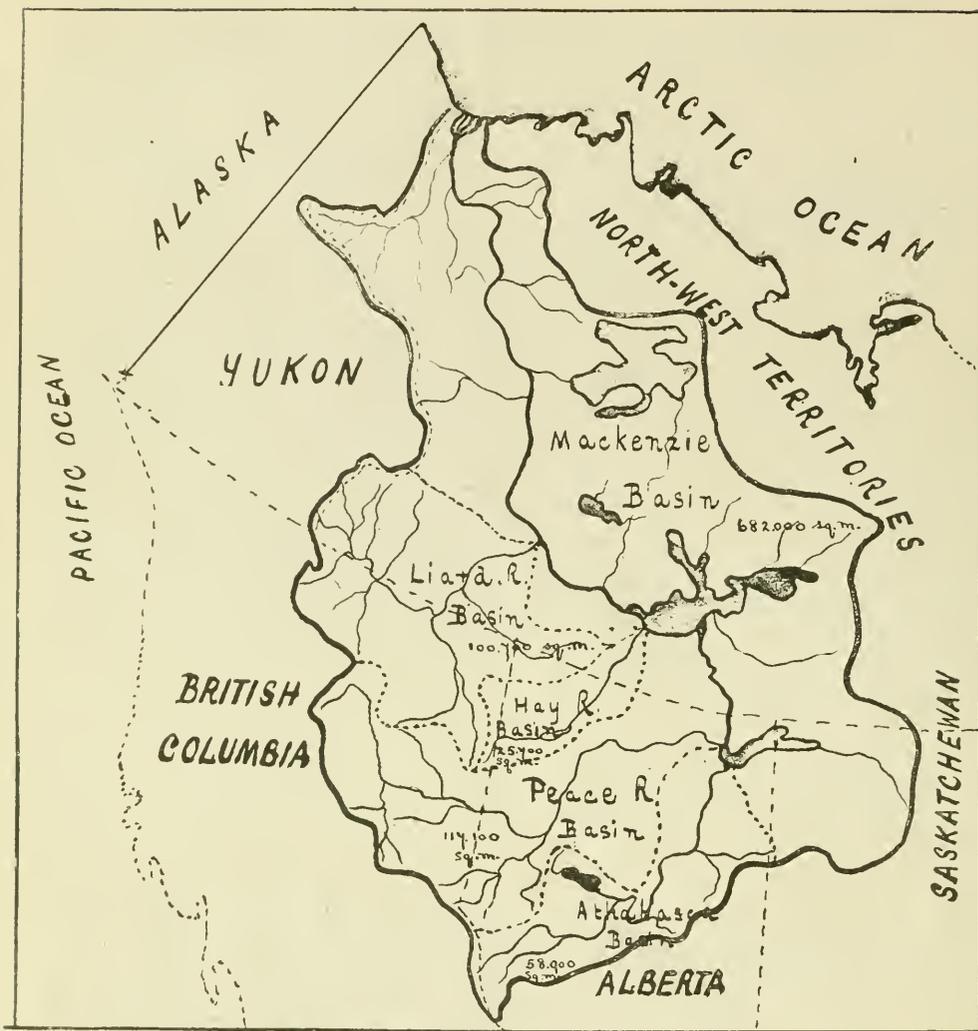
(*"Land of Little Sticks"*)

A considerable portion of this area, about 200 million acres, has no tree growth of any kind and is known as the "barren lands," whilst another 150 million acres situated in Arctic and sub-arctic regions bears only a sparse and stunted growth of timber, the trees struggling hardily for existence against adverse climatic conditions. This territory is termed by the inhabitants "the land of little sticks."

The following table shows the area of the different classes of land with respect to tree growth in each of the river basins, and it will be seen that out of a total of 630 million acres not more than $49\frac{1}{2}$ or about 8 per cent. carries timber of commercial value.



Typical scene near the delta of the McKenzie, showing scrubby growth of willow, with Eskimo tents and natives in the foreground.



The timber is restricted to the Northern Forest type, being composed of spruce, balsam, poplar, aspen, birch, banksian pine and balsam fir.

The total quantity of timber of merchantable size growing in the McKenzie basin is approximately 67 billion feet and is distributed as shown by the table on a succeeding page.

100 Years for Pulpwood

In addition to saw-log timber there

are approximately 116 million cords of mixed wood.

The rate of growth of the trees in the more northerly districts is very slow, so that although it takes only 30 years for young spruce to attain pulpwood size under the best conditions, it requires nearly 100 years of growth to produce pulpwood timber in the districts adjacent to the upper McKenzie. In sub-arctic regions the rate of growth is almost negligible.



Timber on the Liard River.



Bank of the Peace River near Vermilion, showing trees falling in the river, due to bank erosion.

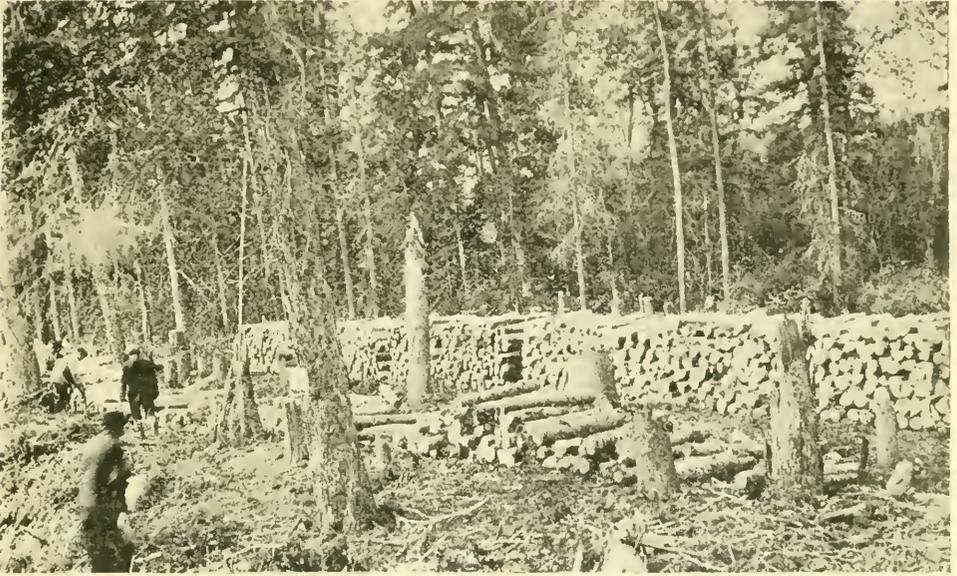
Forests of the McKenzie Basin

ESTIMATE OF TIMBER RESOURCES.

River Basin	MERCHANTABLE TIMBER				CORDWOOD		Total saw-log timber feet b. m.
	Spruce & Fir	Balsam Poplar	Aspen feet b. m.	Birch	Banksian Pine	Mixed woods	
McKenzie	12,800 million	1,500 million	1,000 million	nil.	nil.	30,000,000	15,300,000,000
Liard	9,000 million	4,000 million	3,000 million	1,000 million	1,000 million	25,000,000	18,000,000,000
Hay	1,140 million	750 million	800 million	nil.	350 million	6,000,000	3,010,000,000
Peace	9,000 million	4,500 million	3,000 million	800 million	500 million	30,000,000	17,800,000,000
Athabasca	6,000 million	2,000 million	3,000 million	1,000 million	1,000 million	25,000,000	13,000,000,000
TOTALS ...	37,940 million	12,750 million	10,800 million	2,800 million	2,850 million	116,000,000	76,140,000,000

TABLE SHOWING CLASSIFICATION OF LAND.

Name of River Basin.	Total area	Area waste land acres	Area covered by		Area covered by cord Wood growth	Area covered by merchantable timber acres	Area of prairie acres
			sapling or brush growth acres	acres			
McKenzie	436,000,000	256,000,000	116,000,000	64,000,000	nil.	nil.	nil.
Liard	64,500,000	9,500,000	13,500,000	22,500,000	19,000,000	nil.	nil.
Hay	16,500,000	3,500,000	5,000,000	4,500,000	3,500,000	3,500,000	nil.
Peace	75,000,000	15,000,000	20,000,000	15,000,000	15,000,000	15,000,000	10,000,000
Athabasca	38,000,000	5,000,000	8,000,000	11,000,000	12,000,000	12,000,000	2,000,000
TOTALS	630,000,000	289,000,000	162,500,000	117,000,000	19,500,000	12,000,000	12,000,000



Wood cutting operations on the Peace River near Fitzgerald. The wood is for steamboat use.

Series of French Lectures for the East

A series of about twenty public meetings is being organized by the Canadian Forestry Association for the French-speaking communities of New Brunswick. By the valued co-operation of the Dominion Forestry Branch, the services of Mr. J. A. Doucet have been made available for this purpose. The reception of the plan by the parish priests and the leaders of the various "Societes de l'Assomption Mutuelle" has proved most hearty, so that large audiences are anticipated. Mr. Doucet is well fitted to undertake such an enterprise. He has handled much important field work for the Dominion Forestry Branch, is a native of New Brunswick and rated as an effective speaker. His lecture series will deal with forest protection and other aspects of the forestry question and will doubtless do a sterling service in acquainting the French-speaking citizens of the necessity for conservation policies in the management of New

Brunswick's timber lands. The meetings ought to produce a better understanding of the problems which the administration is endeavoring to solve. Each lecture will be entertainingly illustrated by stereopticon and lantern slides.

ONTARIO'S OPPORTUNITY

Ontario's forests have a greater value, present and potential, than they ever had before. National need has been spurred by the happenings of war. There are increasing demands for fuel, for pulpwood, and for timber of all kinds. These demands will outlast the war. They will probably be most insistent during the post-bellum reconstruction period, when the Dominion sets about the rehabilitation of homemaking, the revival of colonization, the development of new industrial enterprise, and particularly the expansion of shipping.

Woodlands Section Getting Into Shape

The following have applied for membership in the recently organized Woodlands Section of the Canadian Pulp and Paper Association, the first general meeting of which will be held at the Windsor Hotel, Montreal, Thursday afternoon, February 7th. Subjects for discussion: "Modern methods of logging." "Logging Accounting."

A. E. Loosen, Bathurst Lumber Co.
Ethelbert McLean, Bathurst Lumber Co.

John P. Lorden, Bathurst Lumber Co.
Arthur McAdam, Bathurst Lumber Co.

Bonaventure Gauthier, Bathurst Lumber Co.

A. W. Hennessy, Abitibi Power and Paper Co., Limited.

Hugh Hennessy, Abitibi Power and Paper Co., Limited.

P. W. Buchanan, Brompton Pulp and Paper, Limited.

Thos. Lapointe, Brompton Pulp and Paper, Limited.

M. C. Small, Laurentide Company, Limited.

J. H. Hamilton, Laurentide Company, Limited.

Ellwood Wilson, Laurentide Company, Limited.

H. A. Downs, Laurentide Company, Limited.

Col. J. B. White, Riordon Pulp and Paper Co., Limited.

T. E. Draper, Riordon Pulp and Paper Co., Limited.

John Gwynne, Riordon Pulp and Paper Co., Limited.

A. C. Volkmar, Riordon Pulp and Paper Co., Limited.

Roy Campbell, Riordon Pulp and Paper Co., Limited.

H. J. Searight, Riordon Pulp and Paper Co., Limited.

T. W. Dwight, Asst. Director of Forestry, Dept. of Interior.

Clyde Leavitt, Commissioner of Conservation.

Committee of organization:

Angus B. McLean, Bathurst Lumber Co., Ltd., Walter N. Kernan, Donnacona Paper Co., Ltd., Ellwood Wilson, Laurentide Co. Ltd.

One of the very few towns where no taxes are assessed is Freudenstadt, Germany. This town of 7,000 has an annual governmental expense of \$25,000 and pays it all from the revenue of 6,000 acres of town forest.

Dr. J. T. Rothrock, Pennsylvania's first Commissioner of Forestry, says that during his lifetime he has seen one-seventh of the State's area cease to produce wealth. He says of one section: "Wooded, settled, cleared, ruined, since 1725."

The southern portions of Manitoba, Saskatchewan and Alberta have no large supplies of wood. Up to a few years ago, wood, cut locally, was used to some extent, but, with the gradual exhaustion of these supplies, the demand for coal is increasing yearly. The cordwood used in the Prairie Provinces comes from the Rainy River district of Ontario, south-eastern Manitoba, the western shores of lakes Winnipeg and Manitoba, the Riding mountains, the vicinity of Prince Albert, the Kootenay district of British Columbia and Minnesota.

These sources of supply are at a considerable distance from the centres of population, and, as cordwood is bulky, the long freight haul to market largely increases the price. Even in certain of the areas mentioned, supplies of cordwood are becoming exhausted, and it is evident that, under present conditions of transportation, there is no likelihood of its being used to any greater extent than at present.

(Conservation.)

Canada's Foresters Overseas

A Splendid Record of National Service
By the Youngest of Our Professions.

Forestry, the youngest of all the engineering professions in Canada, has given liberally of its manhood to the overseas forces of the Dominion. Numerically, the ranks of Foresters or Foresters-in-training have not yet reached beyond a very few hundred.

According to lists compiled for the Canadian Forestry Journal, and which at best cannot be free from some omissions and inaccuracies, there are 122 foresters or forestry students attached to Canadian forest services or colleges who have donned the uniform and gone overseas. Of this number at least 17 already have been killed, while many others have been wounded in action, some repeatedly. Most of these men enlisted before Forestry Battalions were organized. A few have been transferred so as to utilize their technical abilities, but it is a striking fact that the greater number of Foresters and students were at the front early in the campaign and chose to take their place as fighting men. Some have fought in Mesopotamia, others across the sands of Egypt, and most of them in France and Belgium.

Toronto's Record

Of the relatively small group of graduates and students of Toronto University Forest School, under Dean Fernow, twelve men have made the supreme sacrifice, while twelve others have been either wounded, gassed or victims of shell shock. From the Toronto school alone, there went forth 4 Captains, 29 Lieutenants, 8 N.C.O's, and 24 privates. Indeed, the only men who did not go were those debarred by physical defects. The profession of Forestry in the degree to which the graduates and students promptly placed themselves at the service of their country and cheerfully accepted a tragic record of casualties surely stands in the fore-

front of all callings. Many have given their lives whose services were sadly needed by Canada. Letters from the wounded and from men in desolate corners of the field of war, thoroughly homesick and tired of the business of fighting, nevertheless refuse to complain against conditions or express regret that they were called to a perilous and exhausting task.

(See Next Page.)

ONTARIO'S RESOURCES OF TIMBER

The present area of forest reserves and parks in Ontario is 22,574 square miles, or 14,447,360 acres. This area while large in itself, is not great in comparison with reserves and parks in Quebec; nor is it large in proportion to the total area of non-agricultural lands in Ontario which must always be chiefly valuable for the production of timber. There are many millions of acres of cut-over or burned-over forest lands in the province, belonging to the Crown which are now practically without fire protection, but which contain a great deal of young growth and much timber at present below merchantable size, but which, if protected from fire, would ultimately become merchantable.

Paper pulp in the Scandinavian countries costs seven times more than in 1914; it costs twenty times as much to bring it to France by sea, the insurance being from 8 to 10 per cent. of the value of the cargo; the port dues are from 1 to 6 per cent.; labor costs 60 per cent more; and coal is seven times as dear as before the war.

It now requires \$30.00 worth of coal to make a ton of paper in France, as compared with \$5.00 worth four years ago."

Canada's Foresters Overseas

DOMINION FORESTRY BRANCH

Name	Training	Civil Position	Date of Enlistment	Rank	Branch of Service	Remarks
J. P. Alexander	Toronto, non-grad.	Forest Asst. Crownsnest, F.R.	1915	Lieut.	Pioneers	
G. E. Bothwell	Toronto 1913	Forest Asst. Athabasca, F.R.	1915	Lieut.	Infantry	Killed
W. J. Boyd	Toronto 1914	Forest Asst. Ottawa	1916	Lieut.	Artillery	Wounded
S. H. Clark	Toronto 1913	Forest Supervisor, Brazeau Forest	1917	Corp.	Forestry	
W. A. Delahay	Toronto 1915	Forest Asst. Alberta	1917	Corp.	Engineers, Wounded.	Discharged, 1917.
J. R. Dickson	Mich. 1907	Forester, Ottawa	1917	Pte.	Forestry	
R. G. Lewis	Toronto 1912	Forester, Ottawa	1916	Lieut.	Forestry	
D. A. McDonald	U.N.B. 1914	Forest Asst. Bow River Forest	1916	Lieut.	Forestry	
C. H. Morse	Toronto 1915	Asst. to Dist. Inspector, Calgary	1916	Lieut.	Forestry	
A. E. Barlow	Toronto 1913	Forest Asst. B. C. Columbia Res.	1911	Lieut.	Forestry	
E. H. Roberts	Toronto non-grad.	Asst. to Dist. Inspector, Prince Albt.	1917	Pte.	10th Engr's (Forest) U. S. A.	
F. B. Robertson	Toronto 1914	Forest Asst., Ottawa	1915	Pte.	Infantry	
W. L. Scandrett	Toronto 1912	Forest Supervisor, B. C. Reserves	1915	Capt.	Flying Corp	
L. C. Tilt	Toronto 1912	Forest Asst., Winnipeg	1916	Lieut.	Forestry	

ONTARIO FOREST SERVICE

F. S. Newman	Toronto 1913	Forest Assistant	1916	Lieut.	Forestry	
--------------	--------------	------------------	------	--------	----------	--

PRIVATE EMPLOY—QUEBEC

A. Hanssen	Sweden	Laurentide Co.	1917		Medical Corp	
H. G. Schaneke	Penn. Ste. College	Laurentide Co.	1917		U. S. Forestry	

BRITISH COLUMBIA FOREST SERVICE

L. R. Andrews	Toronto 1912	District Forester, Vernon	1915	Lieut.	Royal Flying Corp	Saloniki
R. E. Benedict		Chief of Operations	1917	Major	10th Engr's (Forest) U. S. A.	
J. R. Chamberlin	Toronto 1914	Forest Assistant, Victoria	1915	Lieut.	Royal Flying Corp	Killed
H. R. Christie	Toronto 1913	Asst. Chief of Operation	1916	Lieut.	Engineers	
Axel Gold	Danish Forest Ser.	Forest Asst., Victoria	1916			
H. C. Kinghorn	U. N. B.	Forest Assistant	1916			
J. Lafon	Baltimore	Chief of Silviculture	1917	Capt.	10th Engr's (Forest) U. S. A.	

Name	Training	Civil Position	Date of Enlistment	Rank	Branch of Service	Remarks
H. S. Laughlin	U.N.V. 1914	Forest Assistant, Victoria	1915	Capt.	Infantry	
E. G. McDougall	Toronto 1911	Forest Assistant, Victoria	1915	Pte.	P.P.C.I.I., wounded and discharged. 1916.	
F. McViekar	Toronto 1913	Forest Assistant, Victoria	1915	Pte.	Cavalry	Reverted from Lieut.
A. G. Mumford		Cruiser, Victoria				
A. Bevan	Oxford & Indian	Forest Assistant, Victoria	1917			
H. K. Robinson	Forest Service	District Forester, Island Dwn.	1915			Killed
W. M. Gibson		Forest Assistant, Vancouver				
J. B. Mitchell		Deputy District Forester, Vancouver	1914	Capt.	Infantry	Military Cross, killed.
CANADIAN PACIFIC RAILWAY						
L. M. Ellis	Toronto 1911	Assistant Superintendent	1916	Lieut.	Forestry Corp	
TORONTO FOREST SCHOOL						
W. N. Millar	Yale 1908	Professor of Forestry	1917	Capt.	U. S. Forestry	
Undergraduates and Graduates not holding civil positions at time of enlisting.						
J. D. Aiken	Grad. 1916		1916		British Artillery	Killed 1916
H. R. Aird	Undergrad.		1914	Capt.	Flying Corp	
J. L. Alexander	Undergrad.		1915	Lieut.		
G. L. Anderson	Undergrad.					
G. W. Bayley	Non-grad.					
A. W. Bentley	Undergrad.		1914			Killed
A. A. Bolte	Undergrad.		1915	Lieut.	British Artillery	Twice wounded.
G. G. Brieker	Undergrad.		1916	Lieut.	Army Service Corp	
Miles Burford	Undergrad.		1915	Lieut.	Forestry	
R. A. R. Campbell	Undergrad.		1914		Artillery	
R. S. Carman	Undergrad.		1916	Corp.	Forestry	Killed 1916
A. T. Clarke	Undergrad.		1915	Corp.	Intelligence Staff	
R. A. Courtneage	Undergrad.		1915	Lieut	Naval Air Service	Wounded and discharged 1917
P. L. Cremar	Undergrad.		1914	Sgt. Maj.	Cyclists	
A. E. Cuzner	Undergrad.		1916	Lieut.	Naval Air Service	
G. M. Dallyn	Grad. 1916		1916	Capt.	Infantry	
E. S. Davison	Grad. 1911		1914			Wounded
W. E. Dexter	Undergrad.		1915	Lieut.	Flying Corp	Killed

Name	Training	Civil Position	Date of Enlistment	Rank	Branch of Service	Remarks
K. B. Downie	Undergrad.					
G. H. Edgcombe	Grad. 1910				Trench Mortar Battery	
H. S. Edmonds	Undergrad.			Lieut.	British Infantry	Military Cross.
G. B. S. Elliott	Undergrad.		1915		Cavalry	Died of Wounds
D. German	Undergrad.		1915		Artillery	Discharged 1916
A. V. Gilbert	Grad. 1916		1916	Staff Sgt.	Forestry	
C. B. Gill	Grad. 1916		1916		Mechanical Transport	Mesopotamia
J. R. Haddow	Undergrad.		1915			
L. S. Hope	Non-grad.		1916		Pioneers	
J. F. L. Hughes	Undergrad.		1915	Lieut.	British Infantry	
H. M. Hughson	Undergrad.		1916	Lieut.	Forestry	Wounded
H. R. Jarvis	Non-grad.					
R. A. C. N. Johnston	Grad. 1917		1917			
Jas. McKay	Undergrad.		1915	Pte.		Ill and Discharged.
G. M. Linton	Grad. 1917		1917	Corp.	Forestry	
A. J. DeLothbiniere	Non-grad.		1915	Lieut.	Infantry	Wounded
P. McEwen	Grad. 1916		1916	Lieut.	British Artillery	
H. C. McKendrick	Undergrad.		1915	Lieut.	Infantry	
A. M. McKenzie	Non-grad.					Killed
F. Mitchell	Undergrad.		1916	Lieut.	British Infantry	Wounded. Ill.
H. A. Parker	Undergrad.		1916	Sgt.	Forestry	
H. C. Paul	Undergrad.		1915	Sgt.	Artillery	Twice wounded
W. M. Pearce	Undergrad.		1915	Lieut.	Infantry	
H. A. Porteous	Undergrad.		1915	Lieut.	British Infantry	Wounded, sent to
T. F. Rance	Grad. 1915		1915	Lieut.	British Artillery	Wounded (Meso-
L. H. Reid	Undergrad.					potamia
R. H. Richards	Undergrad.					Killed
J. I. Sanderson	Undergrad.			Pte.	Artillery	
J. F. Sharpe	Undergrad.		1916	Corp.	Forestry	
J. L. Simmons	Grad. 1916		1916	Lieut.	Artillery	Twice wounded
J. L. Smith	Non-grad.					
W. G. Smith	Undergrad.		1915	Sgt.	Artillery	
F. G. Stupart	Undergrad.		1915			Killed
A. O. Thompson	Undergrad.		1915	Pte.	Cyclists Corp	
A. M. Thurston	Undergrad.		1915			Killed 1916
J. A. Treblecock	Grad. 1915		1915	Capl.	British Artillery	
S. E. Williams	Undergrad.		1915	Pte.	Infantry	
F. H. Wood	Non-grad.			Lieut.		Prisoner

UNIVERSITY OF NEW BRUNSWICK FOREST SCHOOL

Name	Training	Civil Position	Date of Enlistment	Rank	Branch of Service	Remarks
Name	Training	Civil Position	Date of Enlistment	Rank	Branch of Service	Remarks
F. Alexander	Freshman class	N.B. Railway Co. (Cruiser)	1916	Pte.	230th Battal. (Killies)	now in Montreal
C. L. Armstrong	Jun. at Enlistment		1915	Lieut.	23rd Battery	
F. Armstrong	Fresh'n at Enlistment		1916	Lieut.	Won Military Cross,	now at St. John
C. C. Atkinson	Sophomore at Enlist.	N.B. Railway Co. (Cruiser)	1916	Gunner	23rd Battery	
Roland Barnes		N.B. Railway Co. (Cruiser)	1915	Major,	won Military Cross.	
					6th C.M.P.,	now at Hampton, N.B.
S. Bateman						
E. A. Belliveau	Jun. at Enlistment		1915	Lieut.	unit 104th Regiment.	
Norman D. Cass	Jun. at Enlistment		1915	Lieut.	Imperial Army—on 3 mos.	leave at
W. A. Edington	Sen. at Enlistment		1916	Lieut.	Signalling Corps	Fredericton
A. C. Edgewcombe	Jun. at Enlistment		1916	23rd Battery,	now wounded in England	
L. S. Edgett	Jun. at Enlistment		1915	Lieut.		Killed in Action
G. G. Fitz Randolph	Class 1913	Randolph & Baker Co.	1915	Lieut.		Now at St. John, N. B.
G. M. Gibson	Jun. at Enlistment	Cruiser N.B. Railway Co.	1915	Pte.	23rd Battery	
H. F. Harper			1915	Sgt.		
J. B. Hipwell	Grad. Class 1915	Dom. Forestry Branch	1915	Lieut.	5th Battery, C.F.A.	Killed June, 1916
H. L. Holman	Grad. Class 1915	N.B. Railway Co.	1915	Pte.	23rd Battery	
J. L. Kechem	Grad. Class 1915	Dom. Forestry Branch	1916			Killed in 1916
L. A. Kilburn	Junior Class	Crown Land Survey	1916			
S. E. Kitchen	Junior Class		1916	Gunner	9th Heavy Siege Battery,	St. John, N.B.
G. F. Kuhring	Class 1915		1915	Gunner	23rd Battery.	Killed in 1916
F. McGibbon	Class 1915	Dom. Forestry Branch	1915	Corp.	23rd Battery	
R. R. Machean			1915	Lieut.		
C. E. Maimann	Class 1916	Dom. For. Branch in sum.	1916	Lieut in Colored Battalion		
B. D. Millidge	Class 1916		1916	Corp.	Heavy Siege Battery,	now in England
G. Mowatt	Class 1916		1916	Heavy Siege Battery		
C. O. Orchard	Class 1915		1915	Cycle Corps.	Has won D.C.M.	
H. D. Otty	Freshman Class		1915	Heavy Siege Battery		
R. K. Shives	Graduate Class 1913	N. B. Railway Co.	1915	Flight Lieut.—Flying Corps,	killed 1916	
Jas. Smart	Special student	Dom. Forestry Branch	1917	Lieut.	Forestry Battalion	
C. R. Townsend	Jun. Class at Enlistment	N. B. Railway Co.	1915	Gunner	23rd Battery,	won Military Medal,
J. E. Veness	Jun. Class at Enlistment		1915	Lieut at first unit 104th.	(wounded in England	
C. J. Young	Freshman Class	Crown Land Survey	1916		Ninth Siege Battery,	St. John, N.B.

Annual Meeting, Montreal, Feb. 6 and 7.

The Annual Meeting of the Canadian Forestry Association will be held at the Windsor Hotel, Montreal, Wednesday, February 6th, and Thursday morning, February 7th.

At the time this issue of the Forestry Journal goes to press, no final announcement as to the addresses can be made, but the Association will have a strong programme, well worthy of the attendance of all members who can be in Montreal on the dates mentioned.

A special feature this year will be a "Wood Fuel Symposium" in which the wood fuel situation in Canada will be discussed by practical men, including a Forester, a fuel merchant, a railway transportation expert, and others. Mr. A. F. Hawes, U. S. Forest Service, Washington, D. C. will open the subject. No subject has more immediate interest than the securing of an adequate supply of wood fuel for the Canadian people and the various speakers will bring forward constructive ideas as to the best means of surmounting the present difficulties.

On the afternoon of Thursday, Feb. 6th will be held under the same roof the first public meeting of the Woodlands Section of the Canadian Pulp and Paper Association, with special addresses.

On Friday will open the annual Forest Protection Conference organized by the four mutual forest protective associations of Quebec. This conference is certain to attract wide public attention, and will have a programme of vital subjects.

Tuesday, February 5th is the date for the annual meeting of the Canadian Lumbermen's Association, at the Windsor, Montreal, with their annual banquet in the evening. The Canadian Society of Forest Engineers will also hold a business meeting and dinner during the week.

Will Alberta Reduce Needless Fire Losses?

**A Call For Action at the Next Legislature
Session. Why a "Permit law" is necessary.**

Last year the Canadian Forestry Association brought to the attention of the Governments of Saskatchewan and Manitoba the vital need of a better instrument in forest fire prevention than the "Prairie and Forest Fires Acts" then in existence. Both Governments gave the question careful consideration and finally accepted in its main outlines a draft amendment submitted by the Forestry Association and made this part of a

new and vastly improved Fire Act. Fire Commissioners A. E. Ham in Manitoba and A. E. Fisher in Saskatchewan, were to the fore in promoting the cause of better fire protection and found little opposition from their administrative chiefs. Action was taken by both provinces in reducing the risk from settlers' fires started for the purpose of clearing the ground of slash and stumps. Inasmuch as the greater part of new settlement is now

going into tree-covered lands of the northern areas, this peril has become highly acute and resulted in heavy annual losses to timber possessions and the settlers themselves. Those in charge of the Timber Reserves, (made up mostly of non-agricultural soils) have been often helpless to hold back settlers' fires and had no authority to prevent their being lighted in seasons of great hazard.

How the West Has Paid

From this cause alone, the three prairie provinces have lost a vast amount of their own timber supplies. At the same time, the Dominion authorities could not prevent such annual disasters, for the reason that most of the settlers were under Provincial jurisdiction.

Fortunately, Manitoba and Saskatchewan saw the reasonableness of the proposals that they should cooperate in safeguarding their local forest materials. This was done in 1917 by the passing of new Prairie and Forest Fires Acts in both provinces, requiring a settler to take out a permit before setting a clearing fire and giving the enforcement of the provision into the hands of municipal guardians or Dominion rangers. The object of the precaution is to guide the settler in what might become a very dangerous act. There is no hardship to the settler and a good service rendered to the community.

A Loophole in Manitoba

Manitoba's Act in practice divulged one weakness, which the approaching session of the Legislature may remedy. This was in the failure to give Dominion Forest Rangers full authority in a zone about the Reserves. Because of this loophole, much fire trouble was encountered by the rangers in the 1917 season.

Alberta, however, did not see its way to adopt the amendments to its Prairie and Forest Fires Act, although the need in Alberta is perhaps even more pressing than in the two sister provinces. Forests have a special importance for the people of Alberta in that they are essential not only to create supplies for farming and

stock raising, but to maintain the uniformity of the rivers, to make the irrigation enterprises possible, to give pit props to the coal mines, free fuel and building materials to the northern settler, and support and increase the wood using industries. To all such constructive activities, however, the unsupervised settlers' fire is a perpetual menace. If New Brunswick lives up to expectations this year and blankets the province with a "Permit" system to control clearing fires, Alberta would then be the only province tolerating such a public peril. Wherever the "permit" law has been applied it has proved a conspicuous success, winning the confidence of those who at first created some opposition.

Alberta's Opportunity

Will the Alberta Legislature step into line with progressive action this year?

A draft amendment, carefully prepared, and asking only the minimum precautions consistent with the safety of settlers' lives and national property, is now in the hands of the Premier, Hon. Chas. Stewart, awaiting decision.

One of the Canadian Forestry Association's travelling Lecture Sets reached Halifax about a week before the disaster. It was used before several meetings of school children and teachers and forwarded to Sydney, N. S.

To the three Lecture Sets now in use, a fourth will be added shortly, showing the proper management of the woodlot. The latter Lecture will be utilized for meetings where the most direct results may be obtained by confining the subject to woodlot considerations.

The Association invites correspondence from those who can utilize one of the sets to advantage, before a school, church, or general audience. Each consists of from 50 to 55 lantern slides in colors and a manuscript, with complete directions. No charge whatever is made by the Association, the only item of expense being the small fee for expressage.

Loaning Money On Limits

A Plain Talk To Bankers by Mr. Ellwood Wilson,
Chief Forester of the Laurentide Company.

Editor's Note.—A special meeting of members of the Canadian Bankers' Association was arranged by the Canadian Forestry Association in Montreal for December 14th. Representatives were present from most of the leading financial institutions. Mr. Wilson kindly undertook to address the meeting on the subject of "A Financial Analysis of Forestry". Mr. E. L. Pease, President of the Canadian Bankers' Association acted as Chairman.

Bankers are practical men, men whose language is dollars and cents, the only profession which does not allow a limit of error. Your books and accounts must balance to a cent. When the physicist or engineer makes a measurement, he knows that it cannot be absolutely accurate and allows for a certain amount of error and works with it always in view, he says that his work is correct to so and so many places of decimals. Not so the Banker, he works to two places and has no margin of error whatever.

Now I want to interest you in one of the most vital and practical problems which confronts Canada today. It is not necessary with an audience like this to go into statistics and details of the magnitude of our lumbering, pulp and paper and wood-working industries. You all know it, it is you gentlemen who finance these. All I need say is that our industries dependent for their raw material on our forests are second only to agriculture and in the number of men employed are first. Your interest, therefore, in this matter is a very real one, and your influence in the proper use and conservation of this important natural resource is very great indeed. If you are interested, your clients also must be, perforce.

Worked Like a Mine

One or two facts in this connection stand out strongly and I will state them categorically. Our timber supply is not inexhaustible. In the past, our forests have been treated like mines to be worked to exhaustion and then left. They should be treated as an agricultural crop taking a long time to mature and should be properly handled so as to insure a perpetual supply. We are cutting and burning at present, more than our annual growth in every Province, except British Columbia. We are operating so as to gradually make commercially extinct our most valuable species; oak has practically disappeared from our markets; white pine is rapidly following and spruce will be the next to go. A practical and rational policy may be adopted at the earliest possible moment and in this you can be of the greatest service. The war has taught us that timber is absolutely essential for offence and defence. Now we must have timber supplies for the future and we should have sense enough to get together the men who know about these matters, the men who are interested in financing the dependent industries and the men who are operating, and work out a proper general policy and see that proper legislation is enacted to put the policy into force. This will naturally entail higher costs for raw material which must be met by increased cost of product to the consumer and the general public must be educated as to their responsibility in the matter.

We know what our present consumption of wood for all purposes is, pretty closely, and there is no reason in history or in our own experience to make us think that we shall ever need any less; the probability is that



Courtesy "Sunshine"

WATER POWER DEVELOPMENT IN BRITISH COLUMBIA

The waters of Lakes Coquitlam and Buntzen being at different levels are connected by a tunnel and a series of enormous pipes, the power house translating the flow into electrical energy.

we shall need much more. We know the rate at which consumption has increased, so that we can figure that in the future, decade by decade, we shall need so and so much timber. We do not yet know exactly or even approximately how much we have. We have reconnaissance figures for British Columbia and Nova Scotia, a guess for Ontario and partial accurate estimates for Quebec and New Brunswick. We must ascertain roughly our stock, then we must find out how fast it is growing, the amount which is being added year by year, and also the amounts which can be predicted for the lands which have been burnt over and cut over. With these figures before us we can then say that the present stock will last so many years and we shall have to plant so much per year to meet the needs of the future. The prosperity of not only the timber using industries, but also of the country in general, is bound up in this matter. We have

the men who can do the work, all we need is an educated public sentiment which will back up our Governments to spend the necessary money and the amounts needed, considering the value of the work is relatively small, nothing like, for instance, the expenditures on good roads or other public works. Reforestation work, once started, is like the familiar advertisement, "it works while you sleep," piling up value in almost geometrical ratio.

The Banker's Viewpoint

Now I want to call your attention to some of the things connected with the forests which come within your own special domain. In general, before entering into financial arrangements with a new industry, you assure yourselves that the plant is well designed, that the sources of raw material are ample, and that the men in charge of the work are competent. Also, speaking generally you attend to these matters with wood using

industries, except that you do not generally examine very closely into the supplies of timber. Millions of dollars have been spent for mills which do not even have accurate maps of the lands from which they draw their supplies, and whose only estimates of quantities are made by men who often do not know whether they are exploring their own territory or that of a neighbor. I might mention two cases among several others, which have come under my personal notice. A cruiser of experience, went for his employer up one of our rivers and reported plenty of timber. A year or so later, when foresters were sent over the same territory, they found that there was only a fringe of timber along the river and that the country behind was practically all burnt clean. A large block of limits were bought, having been reported as only very little burnt and a good stand of timber remaining. When a detailed cruise was made, 97 per cent. of the territory was burnt and had only a very slight reproduction. This reflects very little on the cruiser, for he has been expected to cover hundreds of square miles of country in a few weeks and for almost nothing. Naturally he cannot go over the country in detail, but must travel along the rivers which are always the best wooded and must get what little information he can about the back country by climbing a hill and looking through a pair of field glasses.

Another case in point is that of a bank which lent money on limits which were afterwards found to have practically nothing on them. This is work for trained and experienced men which costs money and is amply worth while. If the wood is not there a large investment is saved from an unsound enterprise and if it is in sufficient quantity, the supply of raw material is there and the management has an accurate plan of its territory and an estimate of its resources from which operations may be intelligently planned. Then, too, the mills can be so proportioned that they will always have timber and not be built of such a size that they will use up their raw

material before the investment has been amortized.

Getting Rid of Fire

Until lately timber lands were subjected to heavy fire risks which could not be readily covered by insurance. Now in many sections of the country, co-operative and Government fire protection systems have done away with this menace. In the St. Maurice Forest Protective Association the loss totalled for the past three years is only half of one per cent. and with improved methods which are being adopted each year the loss from forest fires will soon be a negligible quantity. This improvement of fire protection methods has now brought into the field a reliable timberlands insurance company which will insure lands having adequate Government or co-operative fire protection at a very reasonable rate, but will not insure lands not so protected at all. Now, no bank should make loans on timberlands without adequate protection either, but should demand that intending borrowers properly protect themselves by joining Associations. They should also demand proper maps showing location of timber and the certificate of a competent forester as to the amount of timber. In the past no one has undertaken engineering work, or chemical work without the advice of competent technical men and this should be the attitude of timberland owners, whose lands should be handled by trained foresters. It is only necessary to point to the successful enterprises which have availed themselves of such assistance. I do not want to be understood in claiming that such success is due to trained foresters, but I do say that it is significant that the most successful industries are those employing technically trained men throughout their plants and the woods are no exception.

"Sound Common Sense"

The question of reforestation is a large and pressing one and should be faced at the earliest possible moment. Our most successful wood using industry has had such a policy under

consideration for several years and has made a beginning on a good sized scale and is increasing its plantations year by year. Other of the more progressive concerns are following suit. This again is no sentimental proposition but good sound common sense. Instead of having to drive wood for 150 to 200 miles, it can be grown within 5 or 30 miles of the mills and taken by logging railroads from the stump to the mill without the necessity of tying up money in huge storage piles for the winter. Instead of cutting on an average of say six cords to the acre, plantations should yield from forty to seventy cords depending upon the age of the trees. It may be possible to grow a spruce for pulp wood in 14 years; it has been done. Far less area will be required than with natural forests and fire protection costs and management will be much reduced. Studies begun on cut over areas show that we shall probably have to wait fifty to sixty years for a cut of about three cords per acre, paying ground rent at five dollars per square mile per annum.

Where Accuracy Counts

Let us look at this thing from another standpoint. A concern has

large timber limits from which it is cutting. This reduces the capital stock and therefore the value of the limits, on which depreciation should be written off each year, just as is done with every sort of property. So that in examining into the timberland assets of a concern it is not enough to know that they have so and so many square miles of limits, but we must know how much is burnt, how much is lumbered and how much timber per square mile remains. *Many concerns are carrying limits on their books as an asset, which are practically valueless and more are an annual loss because ground rent and fire protection have to be paid for.* Could not the owner of timber lands, for the sake of his business and for the sake of his bond holders, replant each year the amount that he cuts, just as he would replace worn out machinery or plants? In other words we must stop mining our forests and put them under a system of rational management as has been done in European countries, under pressure of necessity. The sooner we commence, the less it will cost us and the more we shall add to our national riches.

About British Columbia!

The total area of the province of British Columbia is 355,855 square miles, or 227,747,000 acres. Of this total area, the lumber industry has at various times selected and acquired title to the timber on nearly eleven and a half million acres, or about 5 per cent. of the total area of the province. The respective areas held under the different forms of timberland title are as follows:

Timber limits—.....	8,374,200	acres
Timber berths (railway belt).....	1,123,117	“
Crown grants (fee simple).....	922,206	“
Timber leases—.....	619,125	“

Pulp leases	354,399	“
Timber sales.....	64,440	“
Tan bark leases	32,252	“
Total	11,489,739	“

The fact that title could be secured to provincial timberlands, up to December, 1907, for the formality of staking and paying the annual taxation, may be assumed to have resulted in title being taken to practically all the timberlands having sufficient value to justify the payment of the taxes (license fees). A more leisurely survey of the forest resources has shown that some valuable areas were overlooked, but it has

also developed the fact that there were included many areas not sufficiently timbered to be of commercial value. The one factor largely offsets the other, and it is fair to say, broadly speaking, that in the judgment of the lumber industry the province of British Columbia is commercially timbered to the extent of about 5 per cent. of the total area.

In addition to the 5 per cent. of commercially timbered lands as noted above, there is 10 or 15 per cent. of the area of the province that bears a forest growth that will eventually come to have commercial value as the prices of wood products increase and new ways are found to log more

cheaply the lighter and less accessible stands of timber.

The cruising and mapping of the timberlands of British Columbia has not as yet progressed sufficiently to indicate closely the total stand of timber in the province. Tentatively, it may be placed as being in the vicinity of 350 billion feet, but of this total not more than 200 billion feet has been adjudged to have a present commercial value by being honored by purchase by private interests. And of this 200 billion about 60 billion feet would interest a logger on the basis of the lumber prices prevailing during the past five years. (Clark and Lyford, Forest Engineers, Vancouver.)

Rising Value of Farm Woodlots!

BY "AHMIK" IN THE TORONTO GLOBE

From a land in which timber was an enemy to be destroyed, to one in which trees are among the most precious of possessions.

This is what has taken place in Ontario within the space of one lifetime.

The nature and extent of the change that has occurred were vividly called to mind on noting the results of the sale of part of a wood lot on a farm belonging to Mr. George Cain, in the Township of Clarke, a few days ago. Ten acres of bush were sold, at an average price of \$100 per acre. Part sold up to \$200 per acre. Some of the poorest, consisting of second growth measuring in circumference no more than the span of a man's arm, went well over \$50.

High Prices Secured

It was mixed timber—elm, maple, hemlock, and a few scattering small pine for the most part. None of it was equal, or anywhere near equal, to the original forest; a good deal of it would have been classed as underbrush, by the pioneers. And

still the timber, as it stood, sold at the prices noted.

"A year ago," said Mr. Cain, the owner of the place, "I offered the whole 50 acres, land, bush, and a good barn, for \$1,800. Now I have sold ten acres of the bush alone for \$1,000, and I have four or five acres of standing timber left still. Seven or eight years ago I sold a block of timber, which was 100 per cent. better than that recently sold, for eight-tenths of the average price per acre."

That statement shows how timber has appreciated in value in the course of a few years. The extent to which timber values have changed in a rather longer period of time is still more strikingly shown by this statement.

"As a lad," said Mr. Cain, "I helped to log up and burn in the fallow timber that was vastly better quality than that disposed of in either of my two sales."

And the man who has witnessed this sweeping change in conditions is still in the full vigor of his man-

hood. That wood fuel has become so scarce in Clarke in the course of one generation shows a grievous lack of foresight on the part of the past and passing generation, because there are thousands of acres in the township, unfit for agricultural purposes, that could have been made a permanent source of wood supply. That these waste areas are not being re-forested is a serious reflection on the present generation.

Only 10 Per Cent. Left

The case of Clarke Township is not an isolated one. All over Ontario there are men, still not old, who can remember when a large part of Middlesex was included in what was then known as the "Queen's Bush." To-day, according to the Bureau of Industries, only a little over 10 per cent. of that county remains in forest—not enough to serve as wind-breaks, still less to provide a source of supply for fuel. Of the counties lying west of Toronto, there are only two that have a fourth of their area wooded. There are eighteen counties in Ontario in which over 80 per cent. of the land is cleared, Peel showing a bad lead with nearly 92 per cent. stripped of timber. In Germany, where the density of population is some fifteen times greater than that of Old Ontario, about one-third of the area was in forest before the war. If 25 per cent., at least, of the land in Old Ontario was covered with tree-growth, and this properly conserved, climatic conditions would be better, there would be no failures in water supply, the Province would have nothing to fear from a coal famine, and the land under cultivation could be made to give greater aggregate yields than are secured now.

Not Learning by Experience

The greatest folly that has been shown in the making of agricultural Old Ontario has been in the wholesale removal of timber from land unfit for growing anything but timber. The greatest present folly in the same connection is in the failure to take immediate steps for the reforestation of areas unfit for profit-

able cultivation.

The most extraordinary thing of all is that in New Ontario—in the great Clay Belt—the folly perpetrated in Old Ontario is being repeated.

In this great north country, which holds so much of hope and possibilities, many of the pioneers are treating trees just as their predecessors did in the frontier counties a generation ago. Although settlement in the north is but of yesterday, there are considerable areas there, in which the fuel question is already an acute one.

The Crown Lands Department is as much at fault as the settlers themselves. It continues, and not improperly, the requirement of a certain area of clearing in return for a deed. Where the Department fails is in not requiring the maintenance of a certain portion in bush in return for a continuance of the deed of possession.

Supervision Needed

In Old Ontario drastic regulation is also called for. In some of the European countries, I understand, a private land-owner has not unlimited control over the timber growing on his property. He cannot cut and slash at will. Cutting, in some cases, if I am correctly informed, can only take place after public sanction has been secured, and cutting must be counterbalanced by fresh planting.

Something of that kind is called for in Ontario. Trees, some trees at least, are longer-lived than men, and it is not right that the possessor of to-day should have full control over the heritage of to-morrow. The fuel question has already reached so acute a stage that in no case should the cutting of immature timber be permitted. Neither should the stripping of land unfit for tillage, or on creek banks, be allowed. The timber, climate and water situation in this Province is such as to call for the adoption of a well thought-out, comprehensive policy of forest conservation.

The most inexcusable feature in

the case" observes the Globe editorial columns, "is in the fact that large areas which have been stripped of timber are unfit for profitable tillage. More inexcusable still is the fact that, in the presence of a clearly recognized fuel shortage, no well-defined plan is being followed for the reforestation of land unsuited to the production of field crops. Measures are not even being taken to prevent the premature

cutting of trees which have barely passed beyond the sapling stage.

The future needs of this Province from a fuel standpoint have been, and are being, ignored. The removal of wind-breaks and of farm woodlots has given free sweep to destructive winds, has reduced the moisture supply for growing crops, and has dried up streams and rendered the water supply in wells uncertain."

Taking Food From Forest Trees

It is said that Daniel Boone and some of our other early pioneers could go into the wilderness with only a rifle and a sack of salt and live in comfort on the game and other wild food which the woods afforded. While few people want to try that sort of thing nowadays, persons who know the food value of the fruits of native trees and shrubs are, according to foresters, able to use them to good advantage in supplementing other foods.

Aside from the numerous edible mushrooms, roots, fruits of shrubs and smaller plants, the trees of the forests afford a large variety of edibles which are highly prized by woods connoisseurs. First in importance, of course, are the native nuts—beech nuts, butternuts, walnuts, chestnuts and chinquapins, hazel nuts, and several kinds of hickory nuts, including pecans. The kernels of all these are not only toothsome but highly nutritious and are used by vegetarians to replace meat. The oil of the beech nut is said to be little inferior to olive oil, while that of butternuts and walnuts was used by some of the Indians for various purposes. The Indians, it is said, also formerly mixed chestnuts with cornmeal and made a bread which was baked in corn husks, like tamales. In parts of Europe bread is made from chestnuts alone. The chestnut crop in this country is being reduced each year by the chestnut blight disease, which in some sections

is gradually killing out the tree.

Acorns are commonly thought to be fit only for feeding hogs, but many kinds of them can be made edible and nourishing for people as well. The Indian custom was to pound or grind the acorns up and leach out the tannin, which makes most of them unfit for eating when raw, by treating the pulp with hot water. The resulting flour, which contained considerable starch, was made either into a porridge or baked in small cakes or bread. As a rule, the acorns of the various white oaks having less tannin are the ones best suited for food, but Indians also used those of the black oaks, even though they contain much tannin. The acorns of the basket or cow oak, the chinquapin oak, shin or Rocky Mountain oak, live oak, and of several other species are sweet enough to be eaten raw.

Another nut which is not suited for eating raw, but from which a palatable food is said to have been prepared by the Indians is the buckeye. The kernels of these nuts were dried, powdered, and freed of the poison which they contain when raw by filtration. The resulting paste was either eaten cold or baked.

Several western pines have seeds which play an important part in the diet of the local Indians. Perhaps the best known of these is the fruit of the nut pine or pinon, which forms the basis for a local industry of some size. Not only is it extensively eaten by local settlers and Indians, but

large quantities are shipped to the cities where the seed is roasted and sold on the street. The similar seed of the Parry pine and the large Digger pine seeds are eagerly sought by the Indians. The latter tree is said to

have gained its name from its use as a food by the Digger Indians. The seeds of the longleaf pine are edible and are improved by roasting. Indeed, it may be said that most nuts are more digestible when roasted than if eaten raw.

Immigration After The War

BY W. F. BURDITT.

CHAIRMAN, TOWN PLANNING COMMISSION, ST. JOHN, N. B.

As to preparation for immigration, one of the first needs is a thorough survey of all government lands available for settlement. A survey that shall take account of the physical characteristics of the country, the quality of the soil, water supply, laying out of farms of such size and shape and in such a way as to conduce to economical operation, laying out of roads with a view to economical transportation, etc., so as to ensure that the man who goes into the wilderness to carve out a farm will be

ultimately rewarded for his labour, and will not find that he had been located on some barren rocky ridge that might have been more profitably devoted for all time to the growing of timber. Through the lack of such preparation in days gone by, there are hundreds of farms in New Brunswick at the present day upon which the owners, by laborious toil, are scratching out a bare subsistence, and which would yield a better profit if devoted wholly to the production of spruce timber.

Can Forests Be Planted At a Profit?

ELLWOOD WILSON BEFORE ST. ANDREW'S LITERARY CLUB, MONTREAL

"Let us make a little calculation. If we hold our virgin timber for sixty years at the present rate of ground rent, which by the way is likely to be raised in 1920 and every ten years thereafter, and allow 4 per cent. compound interest, and at the end of that period cut six cords per acre which is a fair average, our wood will cost 31 cts. per cord on the stump. If we hold our cut over lands for sixty years and cut three cords, interest charged at the same rate our wood will cost 61 cents per cord. Now if we plant at a cost of ten dollars per acre, and pay taxes for sixty years, interest compounded at 4 per cent. and at the end of the period cut fifty cords to the acre which is a conservative figure, our wood will

only cost us 21 cents per cord. Our logging costs will be much cheaper as will also our fire protection and administrative expense. From a purely business standpoint, reforestation is a sound proposition."

C. F. A. IN NEW OFFICES

The Canadian Forestry Association now occupies new and improved offices at 206-7 Booth Building. The growth of the Association's work also made necessary an increase in staff. Both questions were discussed at a special meeting of Directors at Ottawa on January 5th, at which Hon. Sydney Fisher, President, Mr. A. S. Goodeve, Mr. R. H. Campbell and Mr. Clyde Leavitt were present.

(Continued from Page 1476.)

committees in the several towns should be organized in order that the local committees shall protect themselves against extortionary prices.

The Fuel Administrators for each state should appoint committees in each town to canvass all timber land owners and urge upon them the necessity for increasing the cutting of wood not only to be used this winter but for a reserve supply of seasoned wood for next winter. Even where \$2.00 or even \$3.00 per cord is now paid for cutting the wood the owner is receiving more for his stumpage under present prices than he did a few years ago when cutting cost but \$1.00 per cord.

Connecticut's Plan

The State Forester of Connecticut has been working on the wood problem in that state, as member of a committee under the State Fuel Administrator. He expresses the opinion that the campaign for the greater production of wood fuel is increasing the output of cordwood in Connecticut, though the results will show more plainly next winter. Although the consumption of wood will no doubt be considerably increased in the cities, the greatest effect is anticipated in the rural communities, where wood may be the only fuel available next winter and where it is hoped to establish a sufficient reserve supply. Town woodyards are regarded as feasible, especially in connection with the community chopping bee idea, which was started in Massachusetts.

Action along these lines ought, in general, to be even more feasible in eastern Canada than in the New England states, for the reason that, as a general rule, in eastern Canada coal costs more and wood costs less than is the case in New England.

Cut-A-Cord Campaign

The Massachusetts Fuel Administrator has issued a circular entitled "New England Cut-A-Cord Campaign. Stock up the Wood Shed. Coal May be Harder to Get Next Year than This." This circular calls attention to the fact that coal is in

great demand all through New England but that in spite of the best efforts of the Fuel Administrator the supply has fallen far behind the requirements, and the situation is serious. The Fuel Administrator says that the outlook for any improvement in future coal deliveries is unfavorable, and it has become the duty of the Administrator to advise the public of these facts and to urge that personal and community prudence and national patriotism require that New England should begin at once to utilize as fully as may be the native cordwood supplies. The opinion is expressed that an organized effort should be made without any delay to provide a store of wood sufficient for immediate and future needs.

The reports from several states indicate positively that the supply of wood now on hand is everywhere short even of normal requirements, and that there nowhere appears to be any danger of glutting the market through any cutting activity that may be inaugurated. In view of the likelihood that there will be an even greater stringency in the coal situation later in the season, and with the possibility that these conditions may not be materially improved another year, the present or future market for good cordwood bears a most promising appearance.

It was further recommended by the conference referred to above that an appeal should be made to Local Committees of Public Safety in all wood-producing localities and to County Agents as well, to take an inventory of all available supplies of cordwood stumpage that are situated within a reasonable distance of a market, and to endeavor forcefully to arrange for its cutting without delay. The circular concludes by earnestly requesting the Granges and the Farmers' Clubs to immediately take an active part in co-operating with the local Committees on Public Safety in this important matter.

Stop Burning Old Ties

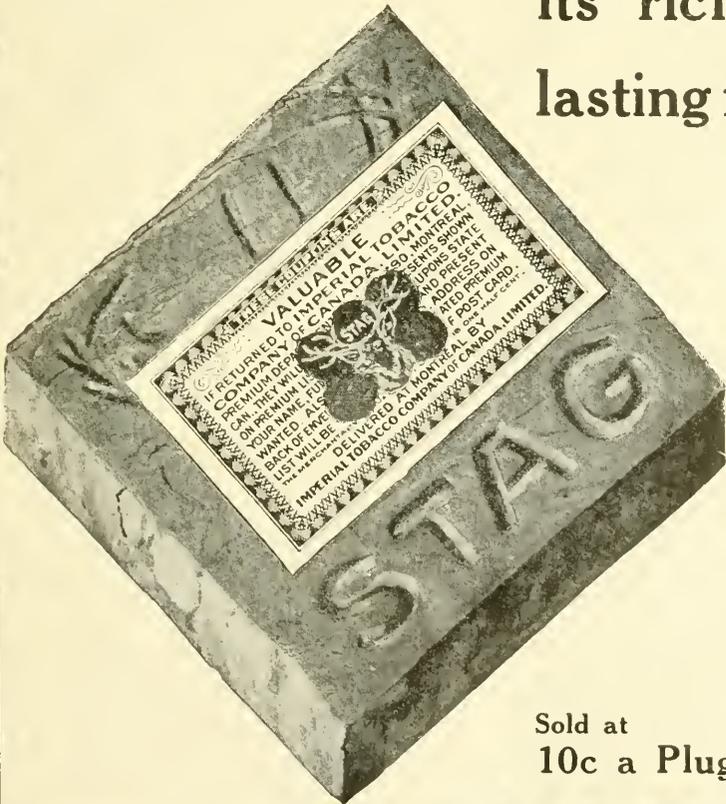
Publicity material, issued by the

STAG

CHEWING TOBACCO

"Ever-lasting-ly Good"

has thousands and thousands
of friends who enjoy daily
its rich and
lasting flavor



Sold at
10c a Plug

federal or state agencies, co-operating to meet this critical situation contain references to the following:

The Boston and Maine railroad and New York Central and Hudson River railroad have decided to stop the burning of old ties. The latter company has been burning 1,750,000 ties each year. It is estimated that these are equivalent to 30,000 tons of coal.

The annual conference of county agents and Farm Bureau representatives held at Durham, N.H., December 5 and 6, adopted a plan which calls for the appointment of men on the Executive Committees of the Farm Bureaus, who shall be responsible for the wood campaign. In many cases, the local Fuel Administrators will be appointed in order to tie up more closely the various agencies concerned.

The Fuel Administrator for Claremont, N.H., reports that the Chamber of Commerce has appropriated \$1,000 for buying stumpage at a price not to exceed \$1.50 per cord; and for cutting and hauling. The wood is to be sold at cost price.

Mr. Frank L. Hildebrand, representative of the Federal Trade Commission in New England, reports that because of the shortage of wood in northern New Hampshire and Vermont, more coal than usual has been consumed. Many localities have had their full quota of coal, and it is doubtful whether they can get more since it would be unfair to other sections.

Municipal Yards

On October 13th, A. W. McAllister, the Fuel Administrator of North Carolina issued a timely circular urging cities and towns as a war measure to furnish wood to consumers at cost. His plan is as follows:

Let each municipality (1) buy wood by wholesale in large quantities for delivery by wagon or railroad at a municipal woodyard, which should be located on a railroad siding if wood is to be shipped in by rail; (2) equip the yard with power-saws, etc., utilizing such available equipment as the municipality already has; (3) use

convict labor, workhouse labor, or street force to do the work; (4) use the municipal teams for delivery of wood to consumer, cut ready for consumption at actual cost; (5) put somebody in charge of the work who is capable of doing it successfully; (6) do not use coal cars for shipping in your supply of wood; (7) if wood cannot be bought in sufficient quantities to supply the municipal yard, contract with land owners for the privilege of cutting the wood under forest conservation restrictions and direct the cutting of the wood with your own labor; (8) encourage consumers to substitute sheet iron wood stoves for their coal burners.

War Fuel Companies

War fuel companies have been organized in practically every country of Tennessee. Each company has a manager who superintends wood cutting. Six per cent. on the money invested is all the profit charged by these concerns, which are directed by patriotic citizens. Wood is being purchased in Tennessee for \$4 a cord delivered. It will retail at \$5.50 a cord for fire wood and \$6.50 a cord for stove wood.

Local Administrator Shurtleff of Lancaster, N.H., reported that 20 business men of his town have contracted for 500 runs of 13 inch wood at \$3 a run, the same to be sold by them at cost.

An effort will be made to have lumber companies keep their crews chopping cordwood after completing the lumber jobs and before the spring drive.

A preliminary survey of the local fuel situation at Missoula, Montana, has been made by the Forest Service. It was found that there is a considerable shortage in the supply of mill-wood which ordinarily furnishes an important-part of the total fuel consumption. Since there is little likelihood that this shortage can be met by an increased supply of coal, efforts were made to locate adequate supplies of cordwood within a reasonable distance of town. Such a supply was found in the form of tops and defec-

tive trees on logged-off lands belonging to the Anaconda Copper Mining Company, which has agreed to permit cutting of this wood free of charge.

The U. S. Forest Service has taken

a very active interest in the wood fuel campaign, and has assigned an expert forester who devotes his whole time to co-operating with other agencies along these lines.

To show how urgent is the need for coal conservation, the following is quoted from bulletins of the United States Fuel Administration:

Why United States is Short of Coal

"This country is short on transportation facilities, therefore it is short on coal.

"One begins to comprehend the nature of the problem when confronted with this fact—the transportation of the 30,000,000 car-loads of coal mined last year constituted more than half of all the freight carried by the railroads.

"But when to this eloquent factor is added the explanation that the railroads themselves in their locomotives used last year between 125,000,000 and 135,000,000 tons of coal, and that they will this year require for their use 175,000,000 tons, it is seen that the hauling of coal is a burdensome proposition.

"The greatest handicap to increasing coal-production during the past year has been the lack of railroad coal-cars, aggravated by the lack of engines and other transportation facilities.

"It would be fortunate, indeed, if the railroads could use their entire rolling stock and power plants, their terminals and their labor force, for the transportation of munitions, of soldiers, and of food, so vital to the prosecution of the war.

"But, unfortunately, the transportation of coal alone uses up 30 per cent. of the entire railroad equipment of the United States, cars, locomotives, sidings, and terminals. Coal shipments clutter up and overtax the roads.

"Coal is therefore not only a problem, but it creates problems. It may all be summed up in transportation. The waster with the shovel, therefore, is a man who stands in a very serious position. With every shovelful of coal he wastes he lowers the efficiency of the man on the firing-line, he lowers the temperature of the cantonments, he reduces the speed of the submarine destroyers, he diminishes the force of the projectile, he slackens the speed of the munition-plant—in brief, he compels the unfortunate use of cars to carry him another shovelful of coal."

"When it is popularly said that munitions will win the war, or that finances will win the war, these are merely other ways of saying that the production of coal, and its application to the war in armaments, war-ships, merchant ships, shells, rifles, tanks, submarines, aeroplanes, or locomotives, will win the war. The war has created a demand upon the United States for one hundred million more tons of coal this year than is normally produced. Because of the car-shortage and the congested condition of the railroads, it will be impossible to increase the supply more than fifty million tons. The remaining gap of fifty million tons will have to be filled in by conservation in the homes and industrial plants of America.

"Arbitrary limitation is a last resort and to be avoided if possible. In many cases industrial concerns have already begun a voluntary curtailment of their use of coal. The way to prevent those losses incident upon limitation of industry is for every consumer of coal to cut off waste and unnecessary consumption with an iron hand and to start on this intensive course of conservation without a moment's delay."

The following, we are told, are the lines of investigation and effort already undertaken by the Conservation Division of the United States Fuel Administration:

"First. The consolidation of plants engaged in certain industries, such as ice-making.

"Secondly. The reduction of electricity used for illuminated signs and needless outdoor display.

"Thirdly. The urging of Congress to pass a law for day-light saving, which, it is estimated, will save at least 1,000,000 tons of coal per year.

"Fourthly. The encouragement of the fullest use of all water-power now available, and the development of all water-power which can be made available in time to be of use in the present emergency.

"Fifthly. A campaign to increase cutting of wood for fuel.

"Sixthly. The encouragement of coal conservation in the homes of the country."

How Wood Can Help

Experience has shown that it is altogether feasible to materially relieve the coal shortage by a more extensive use of wood fuel in at least the following directions:

1. Farmers and rural communities generally, within easy reach of wood supplies, should make as general use of this fuel as possible, to relieve the demands for coal and freight cars alike. To a certain extent this would involve reversion to the old-fashioned

wood-stove, which has become more or less obsolete, even in such communities. This will, of course, be feasible to a lesser extent in the larger towns and cities.

2. The general substitution of wood for coal in furnaces and stoves during early autumn and late spring, as well as during mild weather in the winter, when only a moderate fire may be required. The United States Forest Service advises that where wood is to be burned in a stove or furnace in-

STEREOPTICONS

Do you use a Lantern?

In School, in College or as a travelling lecturer?

The "MCINTOSH" Stereopticons will meet your ideal of what projection should be.

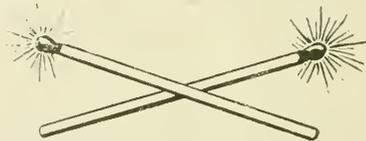
For thirty-nine years McIntosh lanterns have been demanded by the most discriminating users of the United States and Canada.

Let us know your requirements. Do you want an ideal instrument to project opaque objects? Or the most compact lantern in the world for travelling? Or a bigger machine with dissolving effects? Perfect lenses, high class workmanship, beautiful finish and at most reasonable prices.

McIntosh Stereopticon Service

BOOTH BUILDING - - - OTTAWA

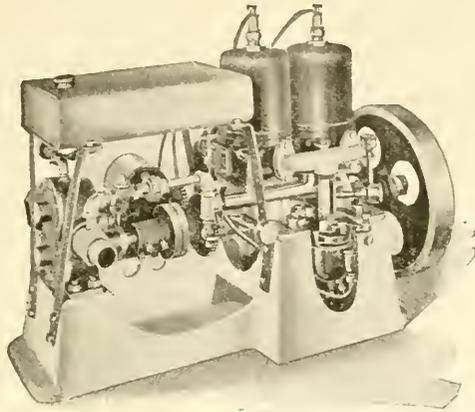
ASK  FOR



 **Dry Matches**
After all day in a boat, rainstorm or wet snow. Ask your dealer for **MARBLE'S WATERPROOF MATCH BOX**

If he can't supply you, we will send prepaid for his name and 50 cents. Dry matches may save your life.

MARBLE ARMS MFG. Co.
Dept. 5160 Gladstone, Mich., U. S. A.



FAIRBANKS - MORSE FIRE FIGHTING ENGINES

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

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

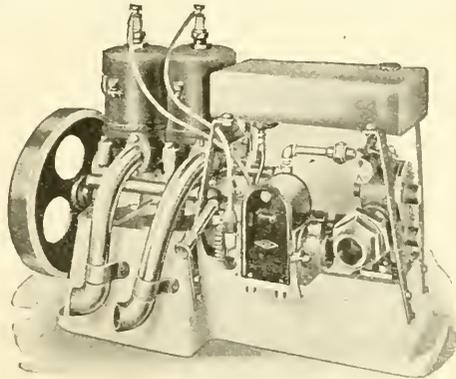
Governments and Private Owners of Forests everywhere, can materially reduce their fire losses by the use of these outfits.

Full information and prices on request.

THE CANADIAN FAIRBANKS - MORSE CO., Limited

MONTREAL - OTTAWA

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



tended for coal, it will be found desirable to cover the grate partly with sheet iron or fire brick, in order to reduce the draught. If this is not done, the wood is wasted by being consumed too fast, and makes a very hot fire which in a furnace may damage the fire box.

3. The heating by wood of churches, lodgerooms, halls, etc., where warmth for only a limited period of time may be necessary.

4. In many cases, it will be quite feasible to eke out limited stores of coal by burning wood in the daytime, reserving coal for holding the fire over night.

5. Furnaces may be run low, keeping the house in general only warm enough to prevent water pipes from freezing, supplementing this by the

use of wood fuel in stoves or grates to keep the living and dining rooms comfortable.

6. Wood can be used much more generally than at present as a substitute for coal in cooking.

7. As Senator Edwards' has pointed out, a great saving of fuel can be accomplished by making windows and doors tight against the entrance of cold air from the outside, through the use of weather stripping, etc.: also by the insulation of furnaces and pipes with coverings of asbestos or other suitable material. Further, wherever possible, the burning of mill waste in incinerators should be avoided by saw-mill owners, and this material reserved for heating during the ensuing winter.

What Should be Done in Eastern Canada!

It has already become necessary for Dominion, Provincial, city and municipal governmental agencies to take a hand in solving the coal problem. Voluntary economy in the use of coal may be expected to assist materially in reducing consumption. Every householder may play an important part in relieving the situation in this way. Furthermore, there are in every city many small families living in large houses, of which only a portion of the rooms are in actual or necessary use. In such cases, a material saving in coal consumption may be accomplished by closing up unused or unneeded portions of the house during the winter months.

All these measures are, however, inadequate to meet the conditions as they are very likely to exist next winter. If therefore becomes exceedingly important to consider how far the generous forest resources of eastern Canada may aid in relieving the shortage of coal, which may in all reason be expected to continue throughout the duration of the war.

More Cutting Needed

The Dominion Fuel Controller has repeatedly called attention to

the urgent need for increasing the production of wood. Provincial Governments have expressed the keenest desire to co-operate in every possible way, and are definitely at work on the problem. City and municipal governments have, in isolated cases, taken steps to accumulate a reserve of wood fuel to supplement the dealers' stocks. Winnipeg purchased a large reserve of wood and the Mayor of that City reports that this action proved an important factor in averting a local fuel crisis. In Ottawa, similar action has for some time been under consideration, and authority is now being sought for the purchase of a reserve supply of fuel by the city. In a limited number of other towns, mostly in Ontario, action of a similar character has been taken or contemplated. In general, however, the situation so far as wood fuel is concerned, has not received anything like the attention which its importance justifies. As in practically all other lines of war-effect, special organization is essential to results.

Publicity Campaign

Surely, if special organization all

along the line is essential in the United States, to stimulate the production and consumption of wood fuel, to reduce the demand for coal, similar action is even more necessary in eastern Canada, or may be expected to become so before next winter. A campaign of publicity, through the press and otherwise, should be instituted, practically parallel to the extensive campaign for food conservation. It is the order of the day to relieve the strain upon war essentials to the wider use of available substitutes. Action along these lines should be taken

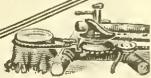
whether it later becomes necessary or not for the authority to enforce conservation, in at least some localities, by prohibiting the use of coal between April 15 and December 15. This is a possibility which has been discussed to some extent, and indicates at the very least how seriously the situation is regarded.

Local Government Action

Each city and municipal government should investigate carefully the local situation, and determine to what extent it is necessary to supplement the efforts of the regu-

Try This Stump Puller at Our Risk

The Smith Stump Puller will take out every tree and stump by the roots, clearing from one to three acres a day, doing the work of twenty men. We want you to send for our 3 year guarantee against breakage and our free trial proposition. Address **W. Smith Grubber Co.** 11 Smith St. LaCrescent, Minn.



TREES, SHRUBS AND SEEDS

Hardy Northern Trees and Shrubs at Lowest Prices. Native and Foreign Tree Seeds

EDYE-DE-HURST & SON, DENNYHURST
 DRYDEN, ONT. Shippers to H. M. Government, Etc. Correspondence Francaise.

YALE UNIVERSITY FOREST SCHOOL
 NEW HAVEN, CONNECTICUT, U.S.A.

Hill's Seedlings and Transplants

ALSO Tree Seeds for Reforesting. Best for over half a century. Immense stock of leading hardy sorts at low prices. Write for price list and mention this magazine. Forest Planters Guide Free.

The D. Hill Nursery Co., Evergreen Specialists
 Largest Growers in America.
 Box 503 Dundee, Ill., U.S.A.

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

For further information address
JAMES W. TOUMEY, Director
 New Haven - Connecticut

PERFECTION SLEEPING BAG WITH PNEUMATIC MATTRESS

These evenly-soft air mattresses may be used on damp ground with perfect safety—they are non-absorbent. And they are absolutely sanitary, with no place for dust or vermin to collect. Easily deflated and inflated—may be rolled into a small light bundle and easily carried in and out of the house. Last indefinitely. Invaluable for motor, yachting and camping trips. Endorsed by the Federal Government.

Write for Catalog and endorsements to-day.
Pneumatic Mfg. Co. 537 17th Street, BROOKLYN, N. Y.



CONFEDERATION LIFE

ASSOCIATION
UNCONDITIONAL
ACCUMULATION
POLICIES.

Are liberal up-to-date contracts which guarantee to the insured every benefit consistent with safety.

Write for Particulars

which will gladly be furnished by any representative of the company or the

HEAD OFFICE, TORONTO



QUEEN'S UNIVERSITY

KINGSTON
ONTARIO

ARTS MEDICINE
EDUCATION
APPLIED SCIENCE

Mining, Chemical, Civil, Mechanical and
Electrical Engineering.

HOME STUDY

Arts Course by correspondence. Degree with
one year's attendance.

Summer School **Navigation School**
July and August. December to April.

GEO. Y. CHOWN,
Registrar.

MINIATURE CONSTRUCTION

Landscape, Mechanical and Architectural Models, Topographical Maps and Paintings. for

SCHOOLS — COLLEGES — MUSEUMS
Government work a specialty

MORGAN BROS. CO., Inc.
MODEL MAKERS

Room 1650 Grand Central Terminal
Phone 7720 Murray Hill

NEW YORK CITY

UNIVERSITY OF NEW BRUNSWICK

FREDERICTON, N.B.

DEPARTMENT OF FORESTRY
Established in 1908

Best of facilities for definite instruction and supervision in Practical Forestry.

Surveying, cruising and construction work carried on in our own tract of 3600 acres, with Forestry Camp in the centre.

Competent men from the School at present in demand to take up Forest Survey work with the Provincial Crown Land Department.

For further information address :

DEPARTMENT OF FORESTRY

University Calendar furnished on application.

C. C. JONES, Chancellor.

R. O. SWEEZEY

B. Sc., M. Can. Soc. C.E.

CONSULTING ENGINEER.

Water Powers. Timber Lands.
Forest Industries.

164 St. James St. MONTREAL.

lar dealers, in order to maintain a suitable reserve of wood fuel for emergency use. All accessible sources of supply should be considered, as well as what measures are feasible to make the necessary amount of wood available for use. No doubt, in many cases, the local dealers may be able to provide adequately for the situation by laying in considerably larger supplies of wood fuel than usual. However, in many other cases this action should not be relied upon, due to the heavy investments involved, and supplementary action by other private interests or by local governmental agencies, becomes essential. The form of such action is a matter to be settled according to the local conditions in each case. Under some circumstances, the city or municipality should purchase a reserve supply, outright. In some cases, some form of guarantee against loss by local dealers may be found practicable, such as would justify the purchase of a stipulated quantity of wood at a fixed price.

Farmers and rural communities generally should revert, so far as possible, to the use of wood fuel. Farmers should also be urged to cut additional supplies of wood for sale for town and city use. This, in the aggregate, would help tremendously in relieving the coal shortage.

Duty of the Provinces

The Provincial Governments, on the other hand, may render a great public service by entering vigorously into this campaign. Some one familiar with conditions, preferably working under the direction of the Provincial Forester, should take these matters up actively with city and municipal governments. A campaign of education may be expected to stimulate both the production and consumption of wood fuel. In some cases, no doubt, timber on Crown lands will be found to be commercially accessible to a specific market; in such cases the provincial authorities may reasonably

be expected to assist materially in the completion of necessary arrangements for cutting. The saving in stumpage cost on Crown Lands, over the privately-owned timber nearer to the towns and cities, should at least go far toward overcoming the higher cost of rail transportation in the case of the former.

Municipal Competition

The aim should by all means be to secure an actual increase in the amount of wood cut and to supplement the supplies that would in any event be handled by the regular dealers. For a city or municipal government to simply compete with the dealers for the limited normal supplies of wood will not improve the situation in the least, and might seriously injure it, by driving the latter partially or wholly from the field. It is perfectly obvious that an increased consumption of wood can follow only from the tapping of new sources of supply, or from a material stimulation of production from normal sources. City and municipal governments should, as already indicated, consider carefully the laying in of a reserve supply of wood fuel, to be held for emergency use, when coal and wood supplies of the regular dealers have become seriously depleted. An investment of this character is simply a reasonable form of insurance against possible disaster.

Since the heating value of wood fuel is in direct proportion to its dry weight, hardwoods, such as beech, birch and hard maple, are to be preferred.

The really essential thing is that there shall be definite recognition that an emergency exists, which can in part be met through the wider use of wood fuel; also that there should be provision for centralized organizations in the several provinces to determine what specific action is necessary and feasible, and for seeing that such action is taken. Steps now under way in this direction will no doubt meet with the full support of the public.

Useful Forestry Books

FERGUSON—FARM FORESTRY

By John Arden Ferguson, A.M., M.F., Professor of Forestry at the Pennsylvania State College. VIIIx211 pages. 5¼ by 8. Many full-page half tones. Cloth, \$1.25 net.

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

KINNEY—THE DEVELOPMENT OF FOREST LAW IN AMERICA

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

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

KINNEY—THE ESSENTIALS OF AMERICAN TIMBER LAW

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

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

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

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

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

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

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

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

TAYLOR—HANDBOOK FOR RANGERS AND WOODSMEN

By Jay L. B. Taylor, Forest Ranger, United States Forest Service. IXx420 pages. 1¼ by 6¾. 236 figures. Flexible Binding, \$2.50 net.

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

P. L. BUTTRICK

CONSULTING FORESTER
NEW HAVEN, CONN., U. S. A.
P. O BOX 607

TIMBER ESTIMATES
UTILIZATION STUDIES
PLANTING PLANS
Landscape and General Forestry
Work.

Eight years experience in practical
forestry work of all sorts.

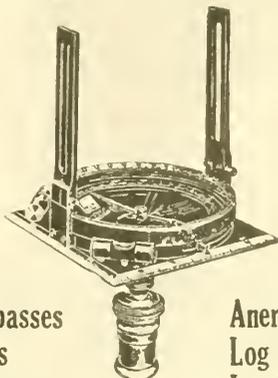
PHILIP T. COOLIDGE
FORESTER

Timber Estimating and Mapping.
Supervision of Lumber Contracts.
Surveying. - - Forest Planting.

STETSON BLDG., 31 CENTRAL ST.
BANGOR, MAINE.

FORESTERS AND RANGERS

EVERYTHING YOU NEED
CAN BE SUPPLIED BY US



Compasses
Tapes
Scribes
Transits
&c.

Aneroids
Log Rules
Lumber
Gauges
Levels, &c.

The Ontario Hughes Owens Company
529 Sussex St. OTTAWA, ONT.

50CTS.

WAR TIME SPECIAL OFFER
ONE WHOLE YEAR
FOR FIFTY CENTS!

We are desirous of adding 1,000 new names to our
list this month and to make it a certainty that we
will not be disappointed we are offering

ROD AND GUN
IN CANADA

to you and 999 others for Twelve Months for 50 cents.

W. J. TAYLOR LIMITED, Publisher - Woodstock, Ont.

**A Live Book on Our Wild
Animals at a Bargain Price!**



In the long winter evenings there is opportunity for burnishing up your half-forgotten knowledge of our Canadian wild animals and for learning a hundred things you never suspected before.

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

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

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

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

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

**ONTARIO FOREST BRANCH
SHOULD CONTROL CUTTING**
(From "Conservation")

Ontario should not delay in placing cutting operations on Crown timber lands under its new Forestry Branch, which has a technically trained staff and is proving itself very efficient. Such a step would avoid duplication and would secure scientific regulation of logging operations with a view to securing reproduction of the forest on cut-over lands. Trained foresters are now in charge of cutting operations on Crown lands in Quebec and British Columbia, and probably soon will be in New Brunswick under the scheme of forest service reorganization now in contemplation.

**THE LATE HON. RICHARD
TURNER**

The recent death of Hon. Richard Turner at Quebec, removes a loyal friend of the Canadian Forestry Association. Mr. Turner was never too busy to comment on the publicity enterprises of the Association and the last word received from him on May 25th, 1917, read as follows: "I am in receipt of your packet of special circulars, which is excellent and commends itself in every word. I have no doubt but your work will educate all classes to be more careful and I heartily concur in all your efforts."

ITALY STOPS BIG OUTPUTS

All manufacturers in Italy who produce more paper than 100 tons per month must contribute to the general fund created February 18, 1917 a quota of \$19.30 per ton of paper manufactured, exclusive of newsprint paper, and manufacturers who produce from 50 to 100 tons per month must contribute \$482.50 per month.

Canadian Forestry Journal, Ottawa.

Please send copy of 'The Animal Guide' in leather binding to the following address. One dollar is enclosed.

Name.....

Address.....

R. R. BRADLEY

Forest Engineer and Mem. Can. Soc. of F. E.
Consulting Forester to the New Brunswick Railway Co.

Timber and Pulpwood Estimates. Forest Maps. Advice on the Management of Wood Lands. Timber lands listed for sale.

GLOBE ATLANTIC BUILDING, ST. JOHN, N.B.

SEEDING and PLANTING IN THE PRACTICE OF FORESTRY

By James W. Toumey, M.S., M.A., Director of the Forest School
and Professor of Silviculture, Yale University.

This book presents both the details of practice, and the fundamental principles that control success and failure in the economic production of nursery stock and the artificial regeneration of forests. It explains the why as well as the how.

Part I. deals with the silvical basis for seeding and planting, more particularly the principles which underlie the choice of species, the closeness of spacing and the composition of the stand.

Part II. is descriptive of the various operations in artificial regeneration and the results that may be expected from the best practice.

Chapter Headings of This Book:

Part I. Silvical Basis for Seeding and Planting.

Chap. I. Definitions and Generalities.

II. } The Choice of Species in Artificial Regeneration.
III. }

IV. The Principles which Determine Spacing.

V. The Principles which Govern the Composition of the Stand.

Part II. The Artificial Formation of Woods.

VI. General Considerations.

VII. } Forest Tree Seed and Seed Collecting.
VIII. }

IX. The Protection of Seeding and Planting Sites.

X. Preliminary Treatment of Seeding and Planting Sites.

XI. Establishing Forests by Direct Seeding.

XII. to XV. The Forest Nursery.

XVI. to XVII. Establishing Forests by Planting.

xxii+454 pages, 6 by 9, 140 figures. Cloth, \$3.50 net.

Canadian Forestry Journal

119 Booth Bldg., OTTAWA.



PETERBOROUGH CANOES

For service our Canvas Covered Canoes are unequalled. We make a complete line of Canoes, Skiffs and Motor Craft. Our catalogue will be of interest to you.



Peterborough Canoe Co., Ltd., Peterborough, Canada



(Successors to Metropolitan Air Goods Co.)

SLEEP ON AIR with a COMFORT SLEEPING POCKET

Recommended by the Forest Service, Campers, Physicians, Invalids, Tuberculosis Patients and Sportsmen everywhere. A warm, dry, comfortable bed. Wind, rain, cold and water-proof. Packs 6 x 25. Air goods for home, camp, yacht, canoe, etc. Illustrated Circular Free by mentioning Canadian Forestry Journal.

**ATHOL MANUFACTURING CO.,
ATHOL, MASS., U.S.A.**

Dealers write

FOREST TELEPHONES



Make the life of the forester better worth living. They relieve him from the appalling loneliness. They help him to keep in human voice touch with foresters miles away.

In emergencies—fire—sickness—hunger—the speed with which they can summon help is marvellous.

Write for full particulars of how to install the Northern Electric Forest Telephone System. Address the Office nearest you.

**Northern Electric Company
LIMITED**

Montreal Toronto Regina
Halifax London Calgary
Ottawa Winnipeg Vancouver

Northern · Electric · Forest · Telephones ·

Canadian Forestry Journal

Vol. XIV.

FEBRUARY, 1918

1917

No. 2



FACULTY OF FORESTRY

MAR 11 1918

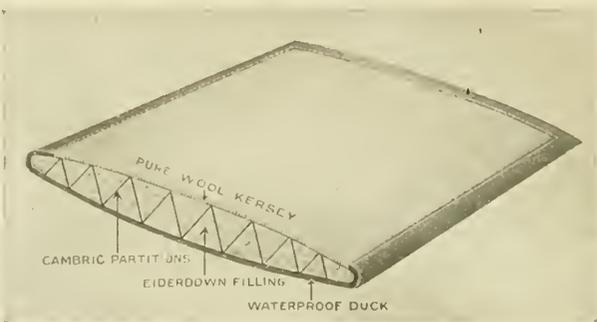
UNIVERSITY OF TORONTO

THE TRAPPER

Foresters, Attention!

Have You Ever Seen
a Robe Like This
Before?

Note the Pure Wool
Kersey Lining—the
Cambric Partitions
that contain the Eider-
down Filling and the
Waterproofed "High
Count" Shelter Tent



Duck.— A great combination—absolutely frost-proof—light as a
feather and lasting almost until the end of time. You need one—you
should have one. *Send us your name for further information.*

Smart-Woods, Limited

OTTAWA
TORONTO
MONTREAL
WINNIPEG

THE UNIVERSITY OF TORONTO

AND

UNIVERSITY COLLEGE

WITH WHICH ARE FEDERATED

VICTORIA, TRINITY, ST. MICHAEL'S
KNOX and WYCLIFFE
COLLEGES

FACULTIES OF

ARTS

APPLIED SCIENCE

MEDICINE

EDUCATION

HOUSEHOLD SCIENCE

FORESTRY

For further information, apply to the Registrar of the University,
or to the Secretaries of the respective Faculties.

Canadian Forestry Journal

Vol. XIV.

WOODSTOCK, ONT., FEBRUARY, 1918

No. 2

CONTENTS FOR FEBRUARY

“Guarding Forests by Airplanes” by Major K. E. Kennedy, Royal Flying Corps.....	1521
“Get Out the Old Oak Stove”—verses.....	1520
“How Uncle Sam Attacks the Wood Fuel Problem” by A. F. Hawes, U. S. Department of Agriculture.....	1525
New Brunswick Decides for New Forest Service.....	1530
In the Forests of France.....	1530
The Work of the Canadian Forestry Association.....	1531
The Annual Meeting at Montreal.....	1536
Forest Conference a Splendid Success.....	1539
A Swiss View of Overseas Axemen.....	1541
More Letters from the Front.....	1544
The Woodlands Section of the C. P. P. A.....	1541

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

Address all Communications to

THE CANADIAN FORESTRY JOURNAL
206-207 BOOTH BUILDING, OTTAWA

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

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



Get Out the Old Oak Stove



Get out the Old Oak stove, Dad,
And set her in the room;
The time we spend a haulin' coal
Is better spent near home;
There's dozens o' trees in the old South lot,
Halfway dead and bound to rot;
They'll make a fire blisterin' hot;
Get out the Old Oak stove.



Get out the Old Oak stove, Dad,
Let's quit a usin' coal;
Our Uncle Sam can't get enough
For all, to save his soul;
The less we use, the more he'll git;
A usin' wood may be "our bit".
To make the Kaiser throw a fit;
Get out the Old Oak stove.

Get out the Old Oak stove, Dad,
Grind up your axe for fun;
Put a bit of set in the old cross-cut
And help to lick the Hun.
There's a bug-killed hickory to use this year;
It's good as coal, or a blame sight near,
And it's got a crackle I like to hear;
Get out the Old Oak stove.

Get out the Old Oak stove, Dad;
The trees we take for wood
Had ought'a been cut long ago,
To do the woodlot good.
We'll clean up all the dead and down
And sell a load or two in town.
Let wood help knock the Kaiser down!
Get out the Old Oak stove.

S. W. A.
F. F. M.

College of Forestry,
Syracuse University

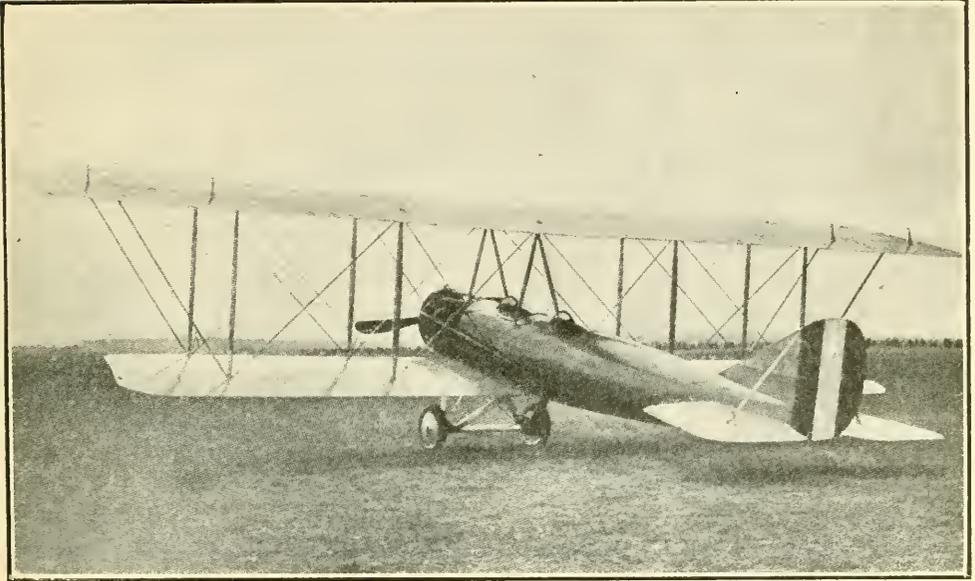


Guarding Forests By Airplanes

BY MAJOR K. E. KENNEDY, ROYAL FLYING CORPS

In an Address at Montreal, February 8th, Before Quebec Forest Protective Association

A Graphic Story Of The Adaptability Of Flying Machines to Forest Protection.



You've got to have an aeroplane of the right type, and a good one of the right type too, because an aeroplane is just the same as anything else, you have to get a good one or you can count on all sorts of trouble. Now, suppose you have, say, a motor car costing from four to eight or ten thousand dollars, and in it you can go through any forest in the land at a clip of from 80 to 100 miles an hour, and at the same time you are able to see everything for 20 square miles or more of the country, and every minute of the time keep absolutely in touch with home by means of wireless, you would say, to put it mildly, that it is a mighty useful car, now wouldn't you?

Indifferent to Roads

Take into consideration the fact that roads (or the lack of them),

rivers, lakes, precipices, and so forth, do not make one scrap of difference. Some *car*, don't you think? Well, that is what you can do with your aeroplane, and you can do it in safety. You can go when and where you like, and come back when you like. It's a great game, I can tell you. The best of it is that the cost will only be a very little more than that incurred in buying a good car. (Applause).

I think I can show you in figures just how it works out, but of course I speak now of the cost with reference to a large way of operating. The small way is not the cheap way, as you all know. Take, for instance, a farmer with a ten acre plot; he does not go to town in a car, he does not use a tractor to plow, etc.; but the big farmer, with the big piece of land, does go to town in a fine big car,

and does use a tractor and all that sort of thing. He uses power right through the whole working of the place. It is just the same with aeroplane operations,—the bigger the field, the bigger the scale of operating, the lower the cost.

8000 Miles a Day!

I have taken as a basis six months' work, as I suppose you would not need more than a six months' fire protective service out of the year. I have counted on three aeroplanes because it is always safer to have an extra one. You see you can count then on having two of them always ready for business, and the third one can be overhauled and repaired if necessary. Operating in a large way the overhead cost comes down, so the larger the scale the better. Say that your machines will do five hours in the air per day. They can do more when necessary, but five hours up is a pretty good day's work. Of course, over at the front the machines are sometimes up for as long as 72 hours at a stretch, but that's pretty tough going and you won't want your fellows to do that here. Now, with two machines working five hours a day in the air you can examine closely 8,000 square miles easily. You could go over a lot more than that, but flying low to make a close examination you can count on 8,000 square miles a day. You can see all over the country as if you were in a high tower, but you can move your tower at will, as it were. When you are flying pretty high you can see tremendous distances.

"Pusher," Best Type

For your work you would want a slow landing machine, say an aeroplane with floats—a hydro aeroplane. You would want what we call a "pusher", that is one with the propeller behind and the place for the pilot up in front where he could have an unobstructed view. With any other type of machine you would find rigging and supports and all sorts of things in the way and your pilot would be twisting and squirming in

his efforts to see and he would have to be somewhat of a contortionist or an acrobat. Up there you are going at such a clip that while you are busy twisting your neck to see around a piece of rigging you will miss about twenty or thirty square miles of country without knowing it. In your work you will not be flying for speed, so I would advise a slow flying, slow landing type of machine. You certainly want a slow lander, for if you land too fast you generally just keep on going until you hit, and then even though your machine stops you sometimes are forced to go a bit further yourself before you make a landing. (Laughter).

Fixing Machines in Flight

Another thing which has to be taken into consideration is the gliding angle. A good machine will glide a long way without losing elevation. Say you have engine trouble; all you have to do is adjust the angle and let her glide while you fix your engine, then when the trouble is fixed off you go again.

It is also very important to get a standard type of machine, so that if parts wear out or break you can send to the factory and get them without any delay; and you can get a stock of spare parts too, and a spare part often comes in mighty handy. This refers to the aeroplane itself as well as to the engine, of course, because you are apt to need all sorts of little things in connection with your aeroplane.

First Investments

Now, to get down to costs: let us take three aeroplanes at \$8,000 each. You can get good ones for that, and aeroplanes are like everything else, the behaviour corresponds to the cost. Well, three at \$8,000, that's \$24,000 for your machines. Then you will want sheds. I don't know just what type you would use out here, but \$1,000 would cover the cost I am sure. That is a capital investment of \$25,000. Ten per cent. interest on your investment, distributed over the six months, or the time in which you will do your work, will be, say \$13.88

per day. I am working on the basis that every day for six months your planes will examine 8,000 square miles. You will need two or three mechanics, at four or five dollars a day, say three of them at four dollars a day; that will be \$12 a day for mechanics. Your pilots will be expensive gentlemen—you'll have to pay them at least \$10 a day each, and you'll be lucky to get them at that; you will have to have two pilots. Now, two pilots, at, oh, you'd better say \$3,500 a year each (because you have to pay them by the year whether you like it or not; will mean \$7,000 a year, or \$38.88 per useful working day. Of course, you could put them at shovelling coal, or some other such highly useful occupation, in the six months they are not flying and lower the cost that way, but if you haven't any work like that for them you just have to carry the gentlemen for six months out of the year in order to have them for the other six. So far the cost per day is \$64.76, that is taken on the basis of six months' work.

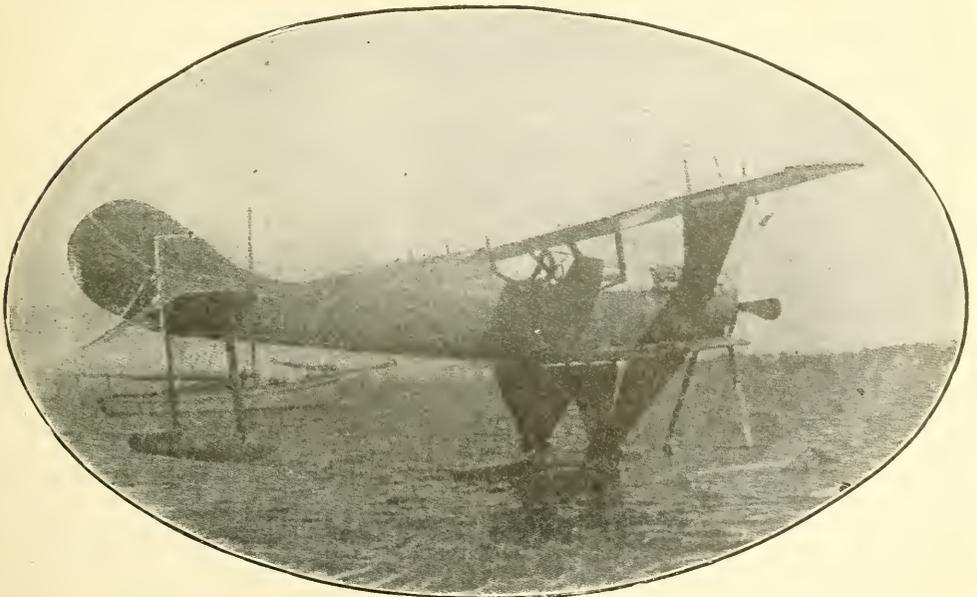
Cost of Flying

We must also take into consideration the question of depreciation and repairs, and that item depends largely

on the mileage flown, but you can say 10 cents per mile for that and you'll be about right. Then you have your petrol and oil; that cost is less than a cent a mile,—quite a bit less if you have an economical engineer. You can count on \$16.80 per day for petrol and oil, for 800 linear miles flying. That means that the total daily expenditure for examining 8,000 square miles every day for six months will be 2.0195 cents per square mile, say 2 cents, or 20 cents per linear mile you fly. I think these figures are fairly accurate, and if they err at all it is on the side of being too conservative. There are many ways in which you might save. For instance, you have to employ the pilot all the year round—you pay him for a year and work him for six months—but as I said before, if you happen to have anything else you can put him at you can save quite an item there.

The Range of Vision

One thing I am often asked is: "Can you see what is going on from an aeroplane—can you see anything much?" That depends on what is going on down below. For instance, a fellow flying over the line in France is keeping his eyes open for enemy



planes; he is dodging "Archies" he is taking photographs from which maps are made; sending wireless messages back to his headquarters; he may be dropping a few bombs here and there; and he still can see horses, carts, guns, trenches, etc., and takes the time to put down everything he sees. Now, if he can do this he ought to be able to see quite a bit of the country he flies over in peace time, don't you think? (Laughter and applause).

We fellows used to have great sport flying low, about 200 feet above the ground, and taking pot shots at birds and rabbits and all sorts of things, but we killed off so many of them that the folks stopped us. You can take a piece of white cloth a yard square and hide it, and I'll guarantee to find it anywhere, from my machine, provided the trees are not too thick.

Going for Eggs by Air

Men, I tell you that with your landing grounds here, with your freedom from the Hun, a fellow can do *anything*; and then an aeroplane is such a handy thing to have. (Laughter). Why, over there at the front when we'd come down after a hard day's work we'd find perhaps that we were short of eggs for our supper. Awful state of affairs! Well, we might know there were some a bit further back, say three or four miles. What do we do? Hop into a machine! off you go, get a couple of dozen eggs, and back you come, all in about a minute. You see, if it had not been for the aeroplane there would have been no eggs in the place. Oh yes,—aeroplanes can be made very useful! (Laughter).

Using the Wireless in Aeroplanes

As for the use of wireless in aeroplanes, wireless telegraphy I mean: I had the pleasure of listening to Mr. Fletcher's very interesting remarks on the subject today, and I only wish I could be permitted to supplement them. Great things are being done "over there," but we can't talk about them. For instance, Mr. Fletcher spoke of the wireless telephone as being in its infancy. Well, all I can say is that the child is growing very rapidly over there. Of course, as I said, I cannot tell you of the great strides being made in the use of various wonderful inventions which are being used at the front, but one phase of this question has just occurred to me which I am at liberty to mention. That is, the use of kite balloons, or sausages, as we call them. A man is sent up several thousand feet in one of these kite balloons, and anchored. Up there he can see immense distances and spot any undue disturbance which might occur in the stretch of country under observation; he has a wireless tele-

phone, and he can keep the ground staff posted—all he has to do is to phone down to his companions. The man who is using wireless telegraphy for his messages has to use a great deal of discretion because his messages stand the chance of being intercepted, or they may be subject to "interference." Of course when he is flying directly to or from his station he gets clearer messages. The "interference" I refer to is electrical interference, of which there is always a certain amount, and this is a drawback in the use of wireless telegraphy. But the wireless telephone! Well, we are going quite fast and doing well with it. I can say that much about it. (Applause).

Surveys by Motion Pictures

There are all sorts of possibilities in the use of aeroplanes. For instance, making surveys by means of moving pictures. I've done it myself; and you can make a very, very accurate survey in this way. And just think of the number of people

who would be able to visit otherwise inaccessible places in comfort and safety! Another development at the front is the transportation of injured men by means of aeroplanes. I suppose people are sometimes hurt in the woods, are they not? Well, say a man is badly injured off in the forest, miles away from any place where he could receive care and attention; all you have to do is to pop him into your aeroplane and take him out to the hospital. There is no jarring from rough roads, or anything of that sort, just a steady, even motion, and you can imagine what a great thing that would be for the chap who had been hurt. You could get him to the hospital in a very few minutes. There is no doubt at all, gentlemen, travelling by aeroplane is the most

comfortable way in the world.

Carrying Food

Another instance of the usefulness of aeroplanes is that of the siege of Kut-el-amara. When that city was besieged by the Turks food was taken in by means of aeroplanes, as you all know. Of course they didn't get enough in, but that was not the fault of the machines, it was because they didn't have enough of them.

MR. FLETCHER: How much weight can you carry?

MAJOR KENNEDY: Well, I can take a machine, an ordinary machine which is not what would be considered up-to-date at all, and carry a ton with comfort.

(To be concluded in March issue).

How Uncle Sam Attacks the Wood Fuel Problem

BY A. F. HAWES

United States Department of Agriculture. Address given at Annual Meeting of Canadian Forestry Association, Montreal, February 7th, under title "The Wood Fuel Campaign in the United States"

Organizing Idle Labor—Cut-a-Cord Clubs—Sawbuck Clubs For Boys. A Striking Article of Practical Suggestion.

The fuel wood campaign in the United States is now assuming fairly large and definite proportions. It was started and is being conducted by the Department of Agriculture and the Fuel Administration co-operating, and has for its definite object the substitution of wood for coal just as far as is practicable. It is not expected that the use of wood in the cities will be materially increased; or that the railroads will be burdened with wood since it is more bulky than coal, in proportion to its heating value. Neither is there any object in substituting wood in the vicinity of coal mines. Team-hauled wood should replace railroad-hauled coal as far as possible. Farmers and

other woodland owners throughout eastern United States have gradually drifted into the use of coal while plenty of wood in their own woodland went to waste. This practice should be discouraged. Villages and small cities in the vicinity of woodlands can greatly increase their use of wood. In a few cases cities of moderate size may be supplied by wood hauled by auto truck or by water.

The coal shortage on January 1, 1918, was estimated at 50,000,000 tons. Assuming a cord of wood on an average equal in its heating capacity to two-thirds of a ton of coal, an increased cut of 75,000,000 cords would be necessary to meet this deficiency.

Since the present estimate of cord-wood cut in United States is 100,000,000 cords this means an increase of 75 per cent. in the output of cord-wood over the normal annual consumption. Those responsible for the movement will be well satisfied, because of the shortage of labor, if an increase of 25 per cent. can be obtained the present year.

How it is Organized

The method of organizing the wood fuel campaign has varied somewhat in the various States, but in almost every State where progress has been made the Federal Fuel Administrator of the State has appointed a Wood Fuel Committee to direct the movement. This Committee usually consists of the Fuel Administrator as Chairman, the Director of Extension at the Agricultural College, the Chairman of the State Council of Defense, the State Forester, or Professor of Forestry at the Agricultural College. In some States this State Committee has in turn appointed County Committees. In nearly all cases the work in the county is carried on jointly by the County Fuel Administrator and the County Agricultural Agent.

The methods of conducting the campaign have been along the following general lines:

1. Publicity along two lines to popularize the use of wood by consumers; and to encourage the production of wood by woodland owners. This has been done through the newspapers, posters, movies, the pulpit, the schools and in other ways. An attractive, though too detailed, poster has been used through New England.

2. Stimulating production by guaranteeing a market for the product. The price of wood varies greatly in different parts of the country according to the price of coal; from \$5 to \$6 a cord in the vicinity of the soft coal mines of Missouri, and Illinois to \$15 to \$18 in the cities of New England. Under the former conditions practically nothing is allowed for stumpage, and there is little incentive to cut. Where the very high prices obtain on

the other hand no one will burn wood or even order it so long as any coal is obtainable. In view of the disastrous result of fixing a maximum price for coal it has not been thought best to establish any such price for wood. Unless there is an embargo on shipping coal into wooded districts, woodland owners are naturally afraid of an over-production of wood and a consequent drop in the price. This conservation, especially on the part of farmers, must be met by some method of guaranteeing a market for wood at a remunerative price. Several methods are being worked out in the various States. The safety of all of them rests upon the fact that the Fuel Administrator may exclude coal if he sees fit and thus maintain the value of the wood.

The Plan in Maine

In Maine the local committee has made a careful canvass of the possible consumers to determine how much wood could be disposed of at a definite price. The plan is to allot these individual orders to the various farmers in the region. In this way the committee acts as a clearing house to bring producer and consumer together.

In Tennessee and New Hampshire the matter has been handled somewhat differently by the formation of War Fuel Companies. A few public-spirited citizens get together and form a company to buy wood and sell it either at cost or at a price sufficient to give them a 6 per cent. profit.

Municipal Yards Best

The best method of guaranteeing a market is undoubtedly through the establishment of municipal wood yards. More progress along this line has been made in the South than in the North. For example, a number of cities in Georgia have prevented much suffering among the poor by establishing municipal wood yards. In Athens the local fuel administration has set a price of \$6 a cord for pine delivered, and \$7 for hardwood.

In North Carolina at least twenty cities and towns now have municipal wood yards in operation. Detailed

information regarding one of these, that of Durham, N.C., may be of interest. The management of the fuelwood situation lies in the hands of a committee of three, one from the city government, one from the county commissioners, and the secretary of the Chamber of Commerce. A wood yard, adjacent to the railroad tracks, was purchased by the city, and the former owner was retained as manager at \$100 per month. The yard is equipped with two electrically-driven circular cut-off saws and a splitting machine. About 60 cords of wood can be reduced from 8 ft. lengths to stovewood per day. The wood comes largely from farmers' woodlands nearby and is green pine and oak, cut in 8 ft. lengths, and split in halves or quarters. The price piled in the woods is \$3.50 per cord. It is hauled from the woods to the roadside by six county teams driven by convicts, and there is piled in a long rick, from which it is loaded on to motor trucks. Three trucks are in use, two three-ton trucks belonging to the county, and a 5-ton truck belonging to the city. The trucks make four trips a day, the distance being $2\frac{1}{2}$ to 3 miles, and carry about one cord per ton of rated capacity; making a total daily delivery of all of them about 40 cords. The cost of hauling is about \$1 per cord. The estimated cost of sawing to stove length is 50 cents to 75 cents per cord. It is sold at \$6 per cord on the yard, or \$7 delivered. It is intended to run the yard at cost, and the prices may be reduced later. The city plans to buy 6,000 cords of standing timber at 50 cents per cord to be cut and hauled by convict and city labor. The estimated cost of this wood "fitted" for delivery is as follows:

Stumpage.....	\$.50
Cutting and splitting.....	1.00
Hauling.....	1.00
Sawing to stove lengths.....	.75

Cost on yard.....\$ 3.25

Why a Municipal Yard?

There are two sound arguments for the establishment of municipal wood yards. The first is that it offers the

best way of guaranteeing a market for a large amount of wood at a uniform price and thus stimulates production. The second is that when properly handled it furnishes an insurance against a serious coal shortage. Such a wood yard should not be handled as an ordinary business with the idea of keeping the minimum allowable stock on hand. There should be a definite plan of maintaining a sufficient supply of wood to relieve any unforeseen coal shortage. This amount will naturally vary with local conditions. It has been suggested that this reserve should equal 10 per cent. of the fuel ordinarily used in the town or city. On this basis a town which uses 10,000 tons of coal would need a wood reserve equivalent to 1,000 tons, or about 1,500 cords of wood. To supply this at \$8 per cord would require a working capital of \$12,000.

The question has been raised whether the possession of such a wood fuel reserve would not mitigate against a community in the eyes of the Federal Administrator and invite an embargo on coal to that community. This can be answered in the negative. The fact is that the Administrators in certain States, notably Indiana and Missouri, are already discriminating against well-wooded regions, and this may be done more widely next winter. Such a community which has a wood fuel reserve will therefore have a great advantage over one similarly situated but without one.

Organizing Idle Labor

The methods described above are aimed to bring about an increased sale of wood. Much wood can undoubtedly also be produced by the consumers themselves and considerable has been done toward bringing this about.

Professional and business men have already been mobilized in some sections to work Saturday afternoons and holidays cutting wood. In Massachusetts a movement has been organized to form "Cut-A-Cord Clubs." Various colleges encouraged their faculty and students to do work

of this kind during the Christmas holidays. In Indiana the boys in some of the rural schools have organized "Sawbuck Clubs." In Connecticut wood cutting bees are being organized, in some cases by the town selectmen. The town buys stumpage at \$1 per cord and pays the men \$2.50 per cord for cutting. This wood is kept as a reserve for the relief of the poor. Millworkers are being greatly helped in their fuel problem in some cities, through the co-operation of the employers, who have arranged for the purchase of stumpage from nearby woodland owners. In one town near Worcester, Mass., millworkers have been putting in Sundays cutting wood which was offered them at a low price. An effort has been made throughout Massachusetts to mobilize the labor thrown out of employment on heatless Mondays for the cutting of wood. It has been pointed out that a man can easily cut enough wood on Monday to keep his family warm for a week.

Forestry and Wood Fuel

It is important that a nation-wide campaign of this kind looking toward the greater production of wood fuel should be conducted along the lines of true conservation. It is therefore particularly fortunate that the campaign has been directed from the start by the U. S. Forest Service. Probably the greatest obstacle to the practice of forestry on this continent has been the lack of a market for the poorer material of the forest. While the straight, sound trees of the more important species have been steadily increasing in value, those unfit for lumber have remained at practically the same low value. In fact in many sections cordwood has been less valuable during the last decade than fifty years previously when the rural population was greater; when people relied entirely on wood as fuel; and when railroad locomotives burned wood. In order to make the practice of silviculture possible it is important to have a profitable market for these low grade woods. It is the splendid market which has prevailed in Europe

even for branch wood that has made such an intensive forestry possible. The present fuel emergency, by giving a much better market for wood than has previously prevailed, makes better forestry practice possible. The foresters aim to take advantage of this opportunity and direct the cutting just as far as possible so that the woodlots will not be depleted, but will be improved. In co-operation with the county agricultural agents demonstration cuttings will be made wherever practicable to serve as object lessons to surrounding owners.

Economy Forced on us.

Certain permanent benefits should result to our forests as a result of this fuel emergency. The attention of the nation has been focused upon the coal problem. Every one realizes as never before how completely we are at the mercy of the railroads for coal, yet how independent we may be for wood, an almost equally good fuel. We realize also that already about one-fourth of the original supply of anthracite coal has been used up, and that at the present rate of consumption, 5 tons per capita, the problem of coal conservation is important. Hereafter it will be imperative for the nation to take the necessary measures to require the use of local wood, a replaceable fuel, as far as possible in place of coal, a non-replaceable fuel. It seems that the tendency must be to return more and more to wood as a domestic fuel as time goes on, and as the country becomes more densely populated.

Some of the organizations at present being developed will also be of permanent assistance in the forestry movement. There is no reason, for example, why the municipal wood yard should not be made permanent. It might be enlarged so as to give farmers an opportunity to sell not only wood, but fence posts, and rough lumber direct to the consumers. Better methods of marketing so as to give the timber grower a greater share of the profit, which has hitherto gone so largely to the operator, will do much to establish permanent forestry on this continent.

The Fuel Merchant's Point of View

How many difficulties face the wood fuel merchant in any private attempt to relieve the coal shortage was interestingly outlined at the "Wood Fuel Symposium" of the Canadian Forestry Association, in Montreal, February 7th, by Lt.-Col. H. Jekyl of Montreal and Lachute, an extensive wood fuel wholesaler.

"Ordinarily, the demand for fuel wood is small," remarked Col. Jekyl. "Last fall I contracted for a large supply of fuel wood and found the demand very little so that I was obliged to dispose of much of it to the chemical plants. Coal is much cheaper, as prices now stand. We are paying farmers as much as \$8.50 a cord delivered to the railway siding.

"Another factor is storage space within the limits of a large city. Space in Montreal is too precious for storage of large quantities of wood fuel. The fuel merchant can store very much more coal in a given area. At present the local yards are nearly all full of cordwood.

"If there were some guarantee to take the wood off our hands should the market fall, we would be glad to make ample provision, but just now we feel that as soon as the war ends the market is sure to sink.

"Cars for cordwood transport are exceedingly hard to get. I have been able to ship only two cars out of a pile of 2000 cords and hence must hold that wood over until next year."

EDUCATING THE FARMER

Lt.-Col. Harkom, Melbourne, P.Q., who followed Lt. Col. Jekyl, observed that most of the wood for fuel came from farmers' woodlots and the price had gone up from four to eight dollars. As many farmers gave only 96 cubic feet of wood for a "cord" it brought the price for a standard cord of 128 cubic feet up to \$11. At the same time, the farmer who could not do his own cutting was obliged to pay three dollars a cord to get his trees felled and sawn. Col. Harkom took issue with the common practice of cutting

the woodlot clean, leaving the area unproductive for perhaps one hundred years. "We are leaving to posterity a big war debt and it is our duty to leave them the means whereby they can pay it." The farmers ought to be educated so as to realize the potential value of a flourishing woodlot and take profits from it without ruining the capital stock.

LUMBERMEN CONCLUDE AN ACTIVE YEAR

The tenth Annual Meeting of the Canadian Lumbermen's Association was held in Montreal on Tuesday, February 5th and proved the most successful in the history of that active organization. The meetings were largely attended as was fully justified by the progressive reports of the President, Secretary and Treasurer, and by the programme of new work to which the Association committed itself for 1918. One project which was received with hearty favor was a formation of a War Service Committee which will act in an advisory capacity to the Dominion Government, and will be competent to furnish at a moment's notice whatever may be asked for in regard to the lumber manufacturing resources of the country. Excellent addresses were given by Mr. H. I. Thomas of Ottawa, on the "Ontario Workmen's Compensation Act," and by Mr. Holt of Chicago on the "Feeding of Men in the Lumber Camp." The report of the secretary Mr. Frank Hawkins, showed that during the year the Association had undertaken many constructive enterprises and had carried them through to success. The session was regarded by all present as constituting a red-letter day in the history of the Canadian Lumbermen's Association. The President for 1918 is Mr. W. Gerard Power.

On Tuesday evening a banquet was held at the Windsor Hotel, Mr. W. E. Bigwood, the President, acting as toastmaster.

New Brunswick Decides For New Forest Service

Telegram from Hon. E. A. Smith, Minister of Lands and Mines, New Brunswick, to the Canadian Forestry Association, Feb. 2nd, 1918: "Our Government is preparing a Forest Act to be introduced at coming session for the better protection of our forest lands placing same under a Forestry Commission to control all branches pertaining thereto, with permanent staff of employees appointed on qualification and merit only."

Readers of the Forestry Journal who have been following the progressive developments in New Brunswick will read the foregoing definite commitment of Dr. Smith with much gratification. It is assumed that the Forestry Commission will contain representatives of the Government, the licensees of limits and owners of "granted" lands. The Forest Act

referred to is in course of preparation and after the thorough consideration given to the question by the Government, with examination of other provincial systems and a series of consultations with forest service authorities, the Act is certain to assure the Province a modern and effective form of administration.

Fire protection is by no means the only undertaking for which the forest service will be responsible. It is probable that in recent years the loss to the public through careless operating of timber tracts mainly by jobbers, has brought about a heavier annual waste of the forest than through the agency of fire. Therefore, the duty of the Forest Service under the new act will be to supervise the cutting and eliminate as much needless waste as possible. This will require not only a clearly worded Act but resolute administration.

In The Forests of France

The following is an extract from a letter received by Mr. R. H. Campbell, Director of Forestry, Ottawa, from Captain W. H. Millar, formerly Professor at the Toronto Forest School, and now with the 10th Forest Engineers of United States in France: We are located in a region now of quite large Scotch pine timber, which is just exactly the same as some of our red pine stands in Northern Ontario, except that the soil is not by any means as dry and sandy as we generally find where red pine grows pure. We are making a clean cut, first cutting out the under storey of hardwood and grubbing the stumps in order to prevent sprout reproduction. This is a planted forest about 75 years old and there are trees in it

well over a hundred feet high and from 18 to 20 inches in diameter at the butt. However, there is not much of this kind of timber in our immediate vicinity, but very large areas of immature stands. I am sorry that I am not able to give you a detailed account of our trip across because I am sure it would be rather interesting to you both as a Canadian and a Scotchman. We received a most enthusiastic welcome in Great Britain which surprised us to a certain extent, especially when we found the French rather undemonstrative, though extremely friendly.

"Although it is now almost Christmas we have not yet had what we would call cold weather in Canada and apparently there is not going to be much winter to speak of.

The Work of The Association

A Twelve-month Of Active Propoganda As Discussed In The Directors Report For 1917.

With the close of 1917, the Canadian Forestry Association concludes the eighteenth year of its history. The concentration of public attention on the prosecution of the War contributed beyond doubt to a readier reception of the Forest Conservation gospel while at the same time making the growth of our membership and the collection of revenues none too easy. The factor, however, most worth emphasizing is that the Canadian people have concerned themselves as never before about the forest resources of their country and the best methods for their perpetuation. This in turn, has stimulated conservation policies as applied by governments and private corporations and is gradually opening the door for an observance of sylvicultural principles in the handling of timberlands.

Public Good Will

The efficacy of educational work in the advancing of Forestry ideas becomes better exemplified each year. While the science of forest management is very old and so thoroughly proven in Europe as to have been a national enthusiasm during a century, its elementary principles of fire prevention have hardly yet been accepted as a whole in Canada and this is due materially to the tardiness of educational propoganda. Most of the major hindrances of fire protection in the Dominion have their origin in an uniformed public sentiment. Even with elaborate administrative machinery and complete technical guidance for the prevention of forest fires one of the first constructive efforts is to secure the goodwill and co-operation of the public. Apart from the initial phase of fire protection the main hope of progress in the management of woodlands or timberlands and the improvement of

forestry practice on public lands, requires not only constructive information but the effort to make it nationally popular.

The Forestry Association utilizes many avenues for educational work, and while obliged to find each year the greater part of the revenues with which it operates, has managed to carry on new work in most of the provinces to advance its membership and record several substantial improvements in provincial and federal laws and administration for which it has specifically campaigned.

Working in the West

Early in the year the Association increased its activities in Manitoba, Saskatchewan and Alberta with the object of securing comprehensive amendments to the existing "Prairie and Forest Fires" Acts, placing a check upon settlers' clearing fires and rendering it obligatory to take out a permit from a ranger or forest guardian before starting such dangerous operations. None of the prairie provinces had hitherto admitted responsibility in curbing settlers' fires despite the annual losses caused to the timber areas and to settlers' property. The absence of any supervision such as is imposed in Quebec, Ontario, Nova Scotia, and British Columbia, created a situation calling imperatively for a remedy. With the co-operation of the Dominion Forestry Branch draft, revisions of the Arts were presented to the Manitoba and Saskatchewan Governments. These were immediately followed by newspaper campaigns in which we were given splendid support by leading Western editors. Influential public bodies such as Boards of Trade, grain growers, lumbermen's associations, etc., supported the Forestry Associa-

tion and their assistance counted materially. The representations made by the Commission of Conservation on the need of a Permit Law were also effective. Pressure was brought to bear by our strong Western membership so that many hundreds of letters were written to legislative members and ministers urging the passing of the amendments. Week by week, new articles were supplied to the newspapers and fresh information to our members. The Government of Manitoba and Saskatchewan finally adopted the new bills and while the provincial machinery for administration is not yet complete the legislation placed a very valuable weapon in the hands of the forest guarding forces. The Alberta Government was approached during the latter months of 1917 and by aid of the Dominion Forestry Branch, amendments to the existing Prairie and Forest Fires Act were submitted to the Premier, Hon. Charles Stewart. These amendments forbade the employment of fire for clearing land in forested regions except by written permit and under supervision of responsible officers of the Dominion of Provincial governments. Twelve Boards of Trade were appealed to for co-operation and most of them addressed the Government favorably on the subject. Influential organizations such as the United Grain Growers, and many others supported the Forestry Association and once more our Alberta membership of nearly seven hundred generously undertook by letter and personal interview to press the matter upon the Provincial Government. The Alberta newspapers gave excellent aid and were kept supplied with special articles. As the session of the Legislature opens on February 7th, we have yet no means of knowing definitely the Government's attitude to our proposals. It is not anticipated however, that Alberta will allow itself to fall behind the sister provinces in a matter of such vital importance.

Political Patronage

Closely allied to the protection of the western forests was the subject of political patronage in Dominion Forest Service appointments. The handicap of political interference in selecting rangers placed the Service at a great disadvantage, wasting public money and nullifying discipline. At midsummer the Association commenced a series of newspaper articles representing the patronage business as it affected the Dominion Forestry Branch in its field management. This developed a wide editorial discussion demanding a cessation of the policy in which many of the leading newspapers referred to the subject repeatedly. It was gratifying, therefore, to have the Dominion Government place itself on record as determined to remove the influence of patronage committees in appointments to the whole of the Civil Service and to take practical steps through the Civil Service Commission to implement that assurance.

In New Brunswick

Believing that the situation in New Brunswick called for the Association's assistance that field was given special study and a part of the year devoted mainly to educational and propagandist campaigns. In this enterprise we had most valued and constant aid from Mr. Clyde Leavitt, Chief Forester of the Commission of Conservation, Mr. W. B. Snowball, of Chatham, N.B., the Minister and staff of the New Brunswick Department of Lands and Mines and our New Brunswick members.

The institution of the Forest Survey by the provincial government and the close sympathy of the Minister of Lands and Mines with the plans of the Forestry Division gave ground for believing that a re-organization of the Forest Service and an extension of its authority to the supervision of cutting and the application of modern fire protection was more than possible. To encourage these objects the Association commenced a newspaper campaign early in the summer discussing th

aims of conservation from various points of view. An illustrated brochure giving a survey of the forest resources of the province, the forest industries, the evidences of fire damage, present character of the fire prevention service as compared with more modern systems, the advantages of supervised cutting and other informative matters calculated to support any Government action for the improvement of the Forest Service. This was given most careful distribution throughout the province and met with a good reception.

Public Meetings

At midsummer the Secretary held nine public meetings in towns and country places. Good audiences were secured and at the same time a much larger field was reached by extended newspaper notices. Two thousand copies of a 32-page illustrated booklet, "Hon. Premier Livre Sur La Forest," were placed with French-speaking children in the northern areas with a special insert regarding New Brunswick's Forest Service reforms. Consultations were had with many New Brunswick authorities who were agreed that educational work was a pre-requisite of progressive legislation. In October, the Secretary held seven more meetings and illustrated lectures in the province and again these were attended by wide newspaper publicity. Following these steps the newspapers and magazines co-operated very generously with the Association in publishing special articles and editorials focusing attention upon New Brunswick's need for a thorough-going forest service. Quantities of newspaper cuts and cartoons were supplied free to thirty of the best circulated papers and liberal use made thereof. The object of supplying these engravings was to help to keep forest problems to the forefront immediately prior to the legislative session.

In the adjustment of difficulties arising from the lack of fire protection along Government Railways right-of-ways through private owned timberlands in New Brunswick the Associa-

tion was also able to be of some help.

Of the many lines of direct publicity, mention may be made here of some of those found especially effective during the year.

In East and West

The Association regards the public meeting method entirely unique as a means of arousing a serious and permanent interest in forest conservation. Thirty-two such meetings were held by the Secretary during the year at Brockville, Vernon, Penticton, Nelson, Calgary and the following points in New Brunswick: Chatham, Moncton, Tabusintac, Millerton, Blackville, Doaktown, Boiestown, Bay du Vin, Woodstock, Fredericton, St. Stephen, Saint John, Sackville, Campbellton and Bathurst. In addition, interviews were had with members and officers of the Governments of New Brunswick, Quebec, Ontario, Manitoba, Saskatchewan, Alberta and British Columbia for the discussion of forest conservation matters. Then Secretary's mileage was in excess of 17,000.

By the co-operation of the Minister of Lands and Forests of Quebec, we were enabled to arrange a lecture route in Quebec for Mr. Avila Bodard, who gave illustrated addresses at ten points and will probably cover many others during the winter and spring. Similarly, we were able to make arrangements in the French-speaking communities of New Brunswick for a series of twenty illustrated addresses by Mr. J. A. Doucet of the Dominion Forestry Branch, for which great favor we are indebted to the Director of Forestry. Mr. Doucet's meetings will take place during February and March. A successful meeting of the chief executives of the Montreal banks and other financial men was arranged by our Association on December 14, Mr. Ellwood Wilson giving an address on the financier's interest in forestry practice.

Travelling Lectures

To encourage the holding of other public meetings for the discussion of Forestry, two travelling lecture sets were added to the two in use in 1916

and those have been widely employed in Ontario, Quebec, New Brunswick and Nova Scotia. By arranging an itinerary with Boards of Education, churches, leaders of Boy Scouts and others, these sets go direct from town to town where advance arrangements have been made for meetings. Each lecture set consists of from 50 to 55 lantern slides, mostly in colors, and a complete manuscript — the whole securely boxed against breakage.

With these travelling lectures operating almost continually, each responsible for from two to five lectures a week with the exception of midsummer, a very large audience in the aggregate is reached.

Winning the Children

To get into contact with a greater number of the school children than can be reached in any other way, three thousand school teachers selected for us by their school inspectors, were supplied with special forestry talks for the children, called "Adventures in the Forest." With each talk went two large printed cards bearing two photographic illustrations and two cartoons which are passed about the classroom at the close of the teacher's address. In many schools, essays are set on the Association's talks. This branch of our propaganda will be widely developed if our means permit.

A commencement was made in the circuiting of motion picture films. The supply of films of educational value is not only very limited but the cost bears heavily upon the Association's small revenues. However, it is hoped to develop a Film Library for circulation in timbered districts. At present the Secretary utilizes motion pictures at most of his lectures.

Helpful Literature

In the field of direct educational work through printed literature, the Association has gone to the limit of its purse. Publications for school children, boy scouts, settlers, railway employees, etc., have been prepared and issued in as large editions as the

funds could bear. While substantial ground has been covered, it is the Association's hope that Governments and private corporations will take up the duty of spreading educational literature, and thereby more adequately cover the ground. Fourteen thousand copies of "Mon Premier Livre Sur la Foret" were given careful circulation in Quebec, New Brunswick and some in Manitoba. Ten thousand of "Your Enemy's Photograph" in two languages were handed to settlers. Substantial editions of "Provincial Rights and the Western Forests," "The Forests of New Brunswick," "Fire," "Who Loses?" "Open Seasons for Fish and Game," "Timber Reserves in Canada and Europe," "Adventures in the Forest," "The Pine Tree," "White Pine Blister Rust," etc., reached a large public such publication being directed where it would do most good. Our method of distribution safeguards against waste as small packets of copies are sent to persons actively co-operating without work, or delivered direct, by post to the ultimate reader.

The Forestry Association's mailbag of out-going literature in 1917 contained a total of over 200,000 pieces.

To Save the White Pine

Steps were taken in April and May to arouse public interest in the white pine blister rust which menaced the white pine areas of Eastern Canada. A popularly-written expert treatise on the subject of the white pine rust was prepared at our request by Dr. Gussow of the Department of Agriculture, and 3,000 copies of it in pamphlet form, well illustrated, were sent through the white pine districts of Ontario, Québec and parts of New Brunswick. The Association communicated with the local councils and school boards of practically all of the towns within reach of white pine areas, supplying them with educational literature on the subject and asking their co-operation in getting the school children, boy scouts and others at work, so as to locate infections.

Newspaper publicity also gave much attention to this subject. We had communicated with the Minister of Agriculture and a large number of the members of the House of Commons placing before them the serious danger certain to follow neglect of the blister rust menace and asking support for the Dominion appropriation of \$50,000 to assist preventive work in Eastern Canada. This grant passed the House without opposition.

At the beginning of the season among many similar schemes to awaken public apprehension of the forest fire danger we addressed appeals to 6,000 Canadian clergymen drawing to their attention the need for public warnings regarding the consequences of carelessness of fire while in or near timbered areas and asking their co-operation in spreading these hints on fire prevention. While unable to trace the results of this appeal we know that in many cases, at least, pulpit announcements were based upon it.

Special Advertising

Early in the Spring four hundred lumber firms were supplied with advertisements setting forth the case for personal care in the forest, and in scores of instances the firms placed the ads. in their local papers and in magazines at their own expense. This will be made an annual enterprise.

The Canadian Forestry Journal has given the Association's work vigorous support and has kept in view its chief office as a propagandist organ. The loyalty of our old members and the adherence of so many new members is very largely due to having a monthly medium capable of popularizing the forest conservation cause. The Association desires to improve the Journal substantially in 1918. The cost of magazine publication has risen rapidly forcing many to forego book paper and illustrations and to increase their subscription rates.

For propagandist purposes, fifty copies of the Journal are sent monthly to the Reading Camp Association

which places them with lumber camps. Copies also now appear on twenty-four Pullman cars and on the tables of the leading clubs and in some of the convalescent homes of the Military Hospitals Commission.

Best Year Financially

Financially, we have had our most advance year with total revenues of \$11,773, and total expenditures of \$10,801.45 leaving a balance at December 31st of \$972.46.

At midsummer, the Association applied to the Minister of Finance for an extra grant of one thousand dollars to develop the work during the remainder of the year and this was given. Special subscriptions were secured from the following firms:

Howard Smith Paper Mills, Ltd., \$100.
 J. R. Booth, \$200.
 St. Maurice Paper Co., \$50.
 River Quelle Pulp and Lumber Co., \$50.
 Brown Corporation, \$150.
 Riordon Pulp and Paper Co., \$150.
 Sir Clifford Sifton, \$100.
 Sir George Perley, \$25.
 Hull Lumber Co., \$25.
 H. H. Hettler Lumber Co., \$50.
 Provincial Paper Mill, \$50.
 Hon. Richard Turner, \$25.00.
 J. K. Macdonald, Toronto, \$10.
 W. E. Bigwood, Toronto, \$50.
 E. B. Eddy Co., \$100.
 A. H. Campbell, Toronto, \$25.
 Pembroke Lumber Co., \$25.
 Whalen Pulp & Paper Mills Vancouver, \$100.
 M. J. O'Brien, Renfrew, \$100.
 Colonial Lumber Co., \$25.
 Belgo Canadian Pulp & Paper Co., \$100.
 Canada Paper Co., \$100.
 Bronson Company, \$100.
 Wayagamack Pulp and Paper Co., \$25.
 Hon. N. Curry, Montreal, \$50.
 McLaren Lumber Co., \$100.
 Lake Megantic Pulp Co., \$50.
 St. Maurice Forest Protective Association, \$100.
 Donnacona Paper Co., \$100.
 Ontario Paper Company, \$100.

Total \$2,235.

The Association's most hearty thanks are due to these special contributors, who have so generously recognized the national benefits accruing from our work.

Membership Growth 2000

In a year filled with so many exciting events within and without the Dominion, the Association's membership could be promoted only with some difficulty. Prospective members were canvassed systematically by letters and literature, many of our old members aiding us from time to time by personal canvass, so that when the year came to a close we had added a total of 2,000 new members. This is about double the additions of 1916, and brings the total membership to 6,200 representing an increase of one hundred per cent. in two and a half years. It is noteworthy, too, that the revenues of the Association have also doubled in the same period.

Wider Effort Needed

At no period has a widespread educational effort been so vitally necessary in the interests of the nation nor has the public mind been so receptive. No work pays higher dividends than the spread of information regarding the natural resources, their maintenance, and utilization. During the past year we have opened many new fields and it is important that successful educative methods should be developed in all parts of the Dominion so that citizens in remote districts, as well as in organized communities, should be brought into contact with conservation ideas. Because of the urgent call for extended service and the adaptability of the Forestry Association for such a mission the Directors feel that the Association will have in 1918 the most liberal co-operation possible on the part of Governments, wood-pushing industries and patriotic citizens in providing means sufficient for the task.

The Annual Meeting at Montreal

Lt.-Col. J. S Dennis Elected President; J. S. Gillies, Vice-President. Large Gain In Membership.

The Annual Meeting of the Canadian Forestry Association was held at the Windsor Hotel, Montreal, on Wednesday, February 6th and Thursday morning, February 7th.

The meetings this year were featured by a Wood Fuel Symposium in which the crisis in Canada's cord wood supply was thoroughly discussed from the point of view of the Canadian forester, the wood fuel merchant, the railway transportation expert, the owner of woodlots, etc. The United States Forest Service very kindly permitted the attendance of Mr. A. F. Hawes, of Washington, D.C., who has had charge of much of the organization by which the United States Government co-operating with many of the States has succeeded in getting near a solution of the wood fuel problem. Mr. Hawes' address

was of a remarkably practical character, filled with suggestions calculated to assist Canadian municipalities facing the same situation.

Directors Present Report

The meeting of the Directors of the Association, held on Wednesday morning, February 6th, was attended by a good representation of Directors and members. The president, Hon. Sydney Fisher, was unable to be present, as he had been undergoing dental treatment of a serious nature, and addressed a letter to the meeting referring to the excellent progress of the Association during 1917, and expressing hearty wishes that the present year should prove most prosperous and useful. In Mr. Fisher's absence, Mr. Wm. Power, former President of the Association, acted as chairman. The nominating committee presented a report, which was

heartily endorsed by the meeting, electing Lieut.-Col. J. S. Dennis, Vice-President of the Canadian Pacific Railway Company, as President of the Association for 1918 and Mr. J. A. Gillies of Gillies Brothers, Lumbermen, as Vice-President. Hon. Smeaton White, President of the Gazette Printing Company, Montreal, was made a Director in the place of the late Denis Murphy. Hon. W. E. Foster, Premier of New Brunswick was made territorial Vice-President for New Brunswick. According to the usual precedent, Mr. Gordon C. Edwards, Vice-President for 1917, would have assumed the Presidency but for a special request made by Mr. Edwards that, owing to matters of health he was unable to assume any new office this year. The report of the Directors covering the main activities of 1917 was read by the Secretary, Mr. Robson Black, and adopted by the meeting. This report which appears elsewhere in this issue of the Journal, shows that the Association has had a very active year and that results of a most practical and important character have resulted from the educational campaigns.

Membership Doubled

The membership of the Association has more than doubled during the period of the war, while the revenues have multiplied to a similar extent. The Directors voted to increase the Secretary's salary by \$200.

The report of the Treasurer, Miss M. Robinson, showed receipts of \$11,775.91 and expenditures of \$10,801.45, leaving a balance at December 31st of \$974.46.

Riddance of Patronage

The resolutions presented the following resolutions which were carried unanimously:

"Whereas, the patronage system of making appointments undoubtedly constitutes the most serious obstacle to forestry and fire protection on Dominion lands in the West.

"Resolved that, this Association continue its efforts to secure the early abolition of the patronage system of

making appointments in the field service of the Dominion Forestry Branch as a part of the general reform to which the Union Government is pledged.

The White Pine Menace

"Whereas, the pine blister disease undoubtedly constitutes a most serious menace to the white pine forests of Eastern Canada, in which it is already now firmly established.

"Resolved, that this Association, while recognizing what has already been done in this direction, continue to exert its influence upon the Dominion and Provincial Governments concerned, to the end that no practicable means be omitted to restrict the further spread of this disease, so far as humanly practicable."

Fire Statistics

The report of the special committee of ten members (T. W. Dwight convenor,) appointed by the Association to take up with the Provincial Government the matter of the collection and publication of uniform statistics of forest fire losses was presented and showed that the committee had made an earnest effort to encourage better methods of collecting statistics and of securing their publication. Copies of the report forms in use by British Columbia, Ontario, and the Dominion Forest Services as well as the St. Maurice Forest Protective Association, had been sent to all members of the committee, who in turn had offered numerous suggestions and criticisms of undoubted value. The report advocated better standardization of the headings under which information gathered is to be classified if uniform summaries are to be made at the end of the season and incorporated in a general publication of fire losses for the Dominion. Such a publication was issued by the United States Forest Service covering the fires in that country. The Dominion Forestry Branch has prepared a summary of the available fire statistics for 1914, 15, 16, covering the whole Dominion, which is in course of publication.

The meeting decided that the committee should continue its efforts in 1918.

An interesting discussion took place as to the possibility of obtaining more detailed information as to the amount of timber destroyed. Mr. Ellwood Wilson thought that the ordinary rangers were not competent to gather such information. The lack of maps was also a great hindrance. Mr. Clyde Leavitt thought that the question should not be looked at wholly from the view point of the private owner. No one would suggest that detailed information of fire losses should be made public with obvious consequences to the limit holder. The Provincial Government, however, Mr. Leavitt thought ought to be in a position to know more definitely what quantities of timber had gone by fire in a given period. The forest protective associations were semi-public bodies. Their rangers presumably were as competent to estimate timber damage as those of Ontario, British Columbia or in the employ of the Dominion Forestry Branch.

Mr. W. C. J. Hall believed that the Province of Quebec was able to present statistics as complete as British Columbia. The question of damage value was not yet a matter of general agreement. Mr. Kernan agreed with Mr. Wilson that the reports as now given by the Quebec Associations were as complete as practicable. Anything more detailed at present would be guess work. The only way to better the situation would be by much expenditure for maps and scientific estimates. Mr. Leavitt strongly contended that an intelligent inspector could be trusted to give an eye estimate, that would prove much more useful than the present disregard for timber damage, evidenced by the report forms. Mr. R. H. Campbell emphasized the necessity of statistics in making any progress. There were a good many uncertainties in estimating quantity or value of areas burned. At present the only way of reaching any conclusion on this point was through careful de-

duction by technical men in the head office. A man on the ground, however, ought to be in better position to make a reasonably accurate guess. Mr. Arthur Graham, Manager of the Ottawa River Forest Protective Association, said that an attempt was now being made to get more complete reports. The most accurate information now available was through the members of the Association and their cruisers and foresters. Mr. Wm. Power, (temporarily vacating the chair), urged that the Association ought not at the present time to express an opinion on the matter. In this Mr. W. F. V. Atkinson concurred. It was agreed on Mr. Leavitt's suggestion that the committee should continue its efforts towards standardization of fire report forms.

The afternoon of Wednesday was devoted to two addresses. The first by R. A. Pringle, K.C. Dominion Paper Controller, on "Some Aspects of Canada's Forestry Problem." The second by Prof. F. F. Moon, Acting Dean New York State College of Forestry, Syracuse, N.Y. on "The Responsibility of the State in Forest Management." The attendance was most satisfactory and the addresses were listened to with keen attention. An address on "Forest Products in Canada" by Dr. John S. Bates of the Forest Products Laboratories, was postponed until the following morning when it was heard with deep interest.

Thursday morning, February 7th, The Wood Fuel Symposium was opened by the chairman, Mr. Wm. Power. Mr. Clyde Leavitt, Chief Forester, Commission of Conservation summarized the Canadian wood fuel situation along the lines made familiar to readers of the Forestry Journal through Mr. Leavitt's excellent article in the January issue.

Uncle Sam and His Wood Supply

Mr. A. F. Hawes of Washington, D.C., whose paper appears elsewhere in this issue, spoke with striking effect on the subject, "How the United States has Attacked the Wood Fuel Problem." Brief addresses were contributed by Mr. G. C. Piche, Chief

Forester of the Forest Service, Quebec; Mr. E. J. Zavitz, Chief Forester of Ontario; Mr. G. H. Prince, Director of Forestry Division of New Brunswick, each summarizing aptly the wood fuel problem as it affected his province and telling of the steps taken thus far to head off what promises to be a fuel crisis in the winter of 1919.

The point of view of the wood fuel merchant was taken by Lieut. Col. Jekyl, whose remarks are published elsewhere in these pages and Mr. Guy Tombs of the Canadian Northern Railway undertook to explain

the transportation problem, as it affected carriage of cord wood to towns and cities.

The Wood Fuel Symposium concentrated a great many points of view upon a subject of first national importance. It was noteworthy, too, that all speakers dealt with the subject from a most practical point of view and spent no time on any phase of it not related to the nation's immediate requirements. Lt.-Col. Harkom acted as chairman during the greater part of the Wood Fuel Symposium as Mr. Power was obliged to attend another meeting.

Forest Conference a Splendid Success

The history of the Forest Protective Movement in Canada will probably look back upon the Conference organized by the Quebec Forest Protective Association at the Windsor Hotel, Montreal, on Friday, February 8th as one of its chief milestones. Not only were the addresses of a thoroughly practical nature but they were given in an interesting form. Motion picture films helped to vary the programme. Mr. Ellwood Wilson, President of the St. Maurice Forest Protective Association officiated as Chairman, and the business of the day was introduced after a brief address on behalf of Archbishop Bruchesi of Montreal. Attractive papers on various aspects of forest protection were read by Messrs. Forrest H. Colby, Forest Commissioner of Maine; J. B. Harkin, Commissioner, Dominion Parks Branch; G. H. Prince, Chief Forester of New Brunswick; E. J. Zavitz, Chief Forester of Ontario; W. G. Howard, Commission of Conservation, New York; W. C. J. Hall, Superintendent Forest Protective Branch, Quebec; G. C. Piche, Chief of Forest Service, Quebec; Ward C. Hughson, President Ottawa River Forest Protective Association; W. Gerard Power, Presi-

dent, Southern St. Lawrence Forest Protective Association and Robert P. Kernan, President, Laurentian Forest Protective Association.

An unexpected but sterling feature of the day's addresses came through the presence of Major K. E. Kennedy of the Royal Flying Corps, who has seen a great deal of service at the Front, and who was prevailed upon to take the platform and tell the meeting some of his impressions as to the adaptability of the modern aeroplane for forest protection. Major Kennedy proved to be a facile and graphic speaker with a thorough knowledge of his subject. The address, published elsewhere in this issue, will throw a great deal of light upon the problem of utilizing aeroplanes for such civil undertakings as forest guarding.

It is a testimony to the rising tide of public interest in forest protection questions that the large meeting hall was completely filled, many visitors standing about the door for lack of accommodation. No previous meeting devoted to this subject registered more than half such an attendance. Mr. Henry Sorgius acted as Secretary of the Conference and deserves great credit for its successful outcome.

MEETING OF THE TECHNICAL SECTION

The Annual Meeting of the Technical section of the Canadian Pulp and Paper Association, held at Montreal, was excellently attended and excited deep interest. Dr. John S. Bates and C. B. Thorne were re-elected Chairman and Vice-Chairman. Three new councillors, Messrs. O. Rolland, John Stadler and F. A. Sabaton, were appointed. The afternoon session consisted in reading a paper on the Estimation of Cellulose in Wood by Dr. B. Johnson and W. R. Hovey, (read by Mr. Hovey), Practical Paper Making by J. J. Sullivan. Coated Papers by J. B. Foullis (read by Mr. Stephenson) and a review of the Paper Industry in Canada by A. L. Dawe.

One of the most interesting features of this year's meetings was a symposium of the natural resources of Canada, as applied to the pulp and paper industry. Mr. L. H. Cole of the Mines Branch read a paper on the "Minerals used in the pulp and paper industry." Dr. A. W. J. Wilson, also of the Mines Branch, addressed the Section on "Pyrite in the sulphite industry." This was discussed by Mr. G. D. Janssen of New York, Mr. John Stadler and others. In the afternoon papers were read by Mr. R. H. Campbell, Director of Forestry on the pulpwood resources of Canada, and Mr. A. M. Beale of the Water Powers Branch. Mr. Campbell's paper was discussed by Mr. Ellwood Wilson and others.

LT. H. R. CHRISTIE, M.C.

Lt. H. R. Christie formerly of the B. C. Forest Branch has been awarded the Military Cross for heroic action at the front.

CHICAGO'S BID FOR TREES

Chicago has entered upon a remarkable forestry scheme. The city is to be completely surrounded by woods, with the exception of the Lake Michigan side. There will be a great half-circle of forest preserves starting from the lake shore to the north, and

running around to the west and south, enclosing the whole suburban area. About 1,000 acres have already been planted, at a cost of \$3,000,000, and \$8,000,000 more is to be spent on the project, under powers granted Cook county by the state legislature.

It is not a mere "reforestation" plan, making amends to nature for the destruction of aboriginal forests. It is an improvement on nature. Most of the area constituting the new forest belt was open prairie land when the white man first saw it.

COUNTERACT I. W. W.

Ten thousand soldiers are being sent into the woods of the Northwest as the Spruce Production Division of the U. S. Signal Corps. Their duties are to get out spruce and fir for airplane stock. These men are volunteering from Western National Army camps and from civil life and from other services to counteract the trouble caused by I. W. W. agitation in western lumber camps. A monthly production of 15,000,000 board feet of spruce is required to take care of the extra needs for the aircraft construction program, and small operators are being encouraged to get out rived timbers in order to speed up production. Four New York State College of Forestry students have enlisted in these logging squadrons and have left Syracuse for Vancouver Barracks.

Pennsylvania spent \$2,275,000 in acquiring one million acres of forest land. Due to rise in timber values, this land is estimated to be worth now six million dollars.

In some sections of the Adirondacks convict labor is being employed successfully in reforestation. At Goldsmith's in the Saranac River Valley a gang of fifteen convicts have planted 300,000 trees on State land.

A Swiss View Of Overseas Axemen

A Swiss forester gives in the *Journal Forestier* an interesting account of a Canadian lumber camp in France in one of the famous fir forests of the State in the Jura Mountains, la Joux. This is a forest of about 6,500 acres of silver fir of magnificent dimensions—very different from most French forests in which Canadians have been working—the trees being often over 160 feet in height and sometimes 3 feet in diameter. The forest being carefully managed under selection system, or perhaps, we should say,

under a long term shelter-wood system, is supposed to permit a sustained yield of 222 cubic feet per acre, valued at \$50 per acre per year—an unusual figure.

From the description, we judge that the operation is organized like a first-class American logging and mill camp, with both cable and animal skidding and a four-foot circular, with cut-off and trimmer saws, and locomobile to carry the lumber. A stone crusher to furnish material for making the heavy bottomless roads passable alone is an innovation.

The Woodlands Section

The organization of the Woodlands Section was completed at a well-attended meeting at the Windsor Hotel, Montreal, Thursday afternoon, Feb. 7th, Mr. Ellwood Wilson presided and the following officers were elected:

President, W. Gerard Power, of Quebec, president of the Canadian Lumbermen's Association; vice-president, Angus McLean, of the Bathurst Lumber Co., Bathurst, N. S.; Both these officers were elected by acclamation with the following board of directors: Thos. Mack, of the Brown Corporation, La Tuque; M. C. Small, of the Laurentide Co.; E. Wilson, of the Laurentide Co.; John Black of the J. R. Booth Co., and F. M. Anderson, of the Shives Co., Limited, Campbellton, N.B.

Mr. F. A. Sabatton, of the Laurentide Co., Grand Mere, gave a stimulating paper on the work of paper mills, especially with regard to the production of newsprint. In this he pointed out the great efficiency in the work of the mills, with better machinery and more perfectly trained men, the increase in the training of the employees having greatly improved the output of the machinery.

Educated in Mills

In connection with this, Mr. Sabatton pointed out that most of the mills were located so far from large centres of civilization that the work of training employees was a hard one. With regard to this, he showed that of 21 paper machine tenders, who were considered the highest class of skilled labor attached to paper mills, 18 were French-Canadians, who had been educated to the work in their own mills. These men, who, otherwise, would have been lumberjacks or farm hands, but for the training they had received with the Laurentide Co., were now making from \$1,400 to \$1,600 a year, and working an eight-hour day, with all sorts of privileges arranged by the company.

A number of other discussions came up, especially with regard to the use of tractors in lumbering operations, which was discussed by Mr. W. Gerard Power and others.

Over 14 million dollars have been spent to get rid of the gypsy moth in Massachusetts and adjoining States.



THE KICKINGHORSE RIVER NEAR WAPTA, YOHO PARK, B.C.



MTS. HUNGABEE AND SCHAFFER, TRAIL 24, B.C.



MT. EDITH CAVELL, JASPER PARK, B.C. *Courtesy Dom. Parks Branch.*

Named in memory of Miss Edith Cavell, the English nurse, who was executed
by German order.

More Letters From The Front

Telling of Logging Under Fire, Shell Splinters In Logs, An Indian Fire Ranger As Sniper, Etc.

Canadians working with the Forestry Battalions in England and France have their own points of view of the unique surroundings of war. The following excerpts from letters received by the Director of Forestry, Mr. R. H. Campbell, will doubtless be found highly interesting.

AN INDIAN RANGER-SNIPER

Some of the most "picturesque" letters which the Dominion Forestry Branch receives from its sixty-odd men overseas are those dictated by Private Matthew Nackaway, an Indian from Norway House, who was previously a fire ranger patrolling a section of country along the Nelson river in northern Manitoba. His commanding officer reports that he and the other Indians attached to the unit are giving very good service. They are employed chiefly as dispatch runners, scouts, and snipers. It is said their ability to creep up close to the enemy posts without being discovered has been of the greatest value to the unit. Private Nackaway was gassed on September 22nd, and was so badly burned by this new form of gas that he was sent to a hospital in England. In a letter to the Director of Forestry, Mr. R. H. Campbell, he describes the effect of this gas as being like that of applying raw mustard to the skin. Private Nackaway is recovering but his lungs still give a good deal of trouble

COL. STEVENSON IN FRANCE

Lt. Col. H. I. Stevenson, who, with the Fort Garry Horse in France but whose work in civil life is that of Supervisor of the Riding Mountain Forest Reserve, in Manitoba, under the Dominion Forestry Branch, has recently written the Director of Forestry to the effect that last sum-

mer he was loaned to the Royal Engineers and took charge of a forest, the prize hardwood forest of France—erected mills, etc. and ran it for about five months with about 3000 men. Col. Stevenson says it was a good experience, a sort of post-graduate course in forestry, as this particular forest is the one in which all the Indian Forest Service spend their time when in France finishing up their course.

FLYING A "BUS"

Lieut. D. A. MacDonald, Royal Flying Corps, England, formerly in the Dominion Forestry Branch as Forest Assistant, Bow River Forest Reserve, in writing to Director R. H. Campbell, says: I completed a six weeks' theory course on Flying Meteorology, and practical Wireless, Machine Gunnery, Engines, Rigging and Artillery Observations, at Reading about three weeks ago and am now undergoing higher instruction in these and learning to fly a "bus." It is the most interesting game I can think of and certainly a wonderful technical education for no cost to yourself. I have felt settled since I finally got started in the R. F. C. which I haven't been since this war started. The R. F. C. has a wonderful equipment for instruction and also is perfectly organized. The average cost to the Government for qualifying a pilot from the time of his appointment until his graduation is high. The largest item of this, of course, is damage to machines due to crashes. I expect it will be well on in January before I get my wings since we have many different machines to fly for 20 hours solo and the weather is too "dud" in the winter months to get in much flying. At present the weather is fair for flying about two days a week. Mr. Finlay-

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

SHELL FIRE IN FORESTS

Major W. A. Lyndon, France, formerly Chief Fire Ranger in the Crowsnest for the Dominion Forestry Branch, in acknowledging the quarterly bulletin sent by the Branch to officers now in the field, writes: "I have been for the past two months living on the battle ground of France. There is not a building standing within ten miles of us. Where the villages stood there is nothing left. It is a sight to see but gets very tiresome to work in day after day among nothing but wreck and ruin. We went through a forest today, that is, what once was one. There was not a foot of ground that had not been turned over by shells, not a tree left standing, only a lot of stubs split and shattered—no protection whatever. It reminds me a great deal of what it is like after one of our big bush fires, only ten times worse.

LOGGING UNDER FIRE

Quarter Master Sergeant S. R. Clark, Canadian Forestry Corps, France, formerly Forest Supervisor of the Brazeau Forest Reserve of the Forestry Branch, Department of the Interior and brother of G. H. Clark, Dominion Seed Commissioner, writing to the head Office, Ottawa, says: I find the French methods of forestry very interesting. This forest has been under Government supervision for many years and the subdivision into compartments based on soil and the resultant type is definite proof of

successful management. The organization of course is strictly military and prior to this war it was sufficiently trained to go to the front as a unit. Only veterans are in charge now. This forest which was cut over by the Huns about last February consisted of oak, 60 per cent.; beech, 30 per cent.; birch, 5 per cent. and the remainder blue beech and ash. Lieut. Tilt (formerly attached to the Forestry Branch in Alberta) made an examination of the area during early summer but owing to the large amount of felled trees which the Huns cut and were unable to utilize before their retreat he found a reliable estimate difficult to make.

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

SHELL SPLINTERS IN LOGS

Captain A. W. Bently, 48th Brigade, France, formerly of the head office of the Forestry Branch, Department of the Interior writes: "Having spent nearly two years out here with the guns I was very interested to read about the French Forests. I have never seen a French forest yet except from the window of a railway carriage whilst going on leave (three times). The remains of a French forest after our high explosive shell has done its work, is only fit for firewood and that is so full of splinters that a saw cannot be used. Wedges are the only means of splitting up the pieces.

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

IRRIGATING TREES

Sergt. B. M. Stitt, Canadian Forestry Corps, France, formerly Chief Fire Ranger under the Dominion Forestry Branch at Pas, Manitoba, in a recent letter to the Branch says: We are still hard at work over here doing our best to supply the growing needs of the front line trenches. We have been cutting white poplar this last two months, most of it going into $2\frac{1}{2}$ in. road plank.

About one-third of the total acreage in the valley we are now working is under reforestation and it is highly interesting to note the growth and system of planting the young trees. We have cut some 5 ft. and over at the stump. Most of the trees are planted along creeks and between every row of trees a ditch is dug which is kept full of water regulated by small gates or weirs.

Finding New Uses For Our Woods

BY DR. JOHN S. BATES

Superintendent, Forest Products Laboratories of Canada. An Address Delivered Before The Canadian Forestry Association, Montreal, February 7th, under title "Forest Products in Canada."

My first intention was to survey the whole field of forest products as briefly as possible. However, this has already been done in a paper † read before the Canadian Society of Civil Engineers, reprints of which are available for anyone interested. It seems unnecessary to repeat this detailed discussion, and I shall therefore touch on only a few points which stand out in prominence before those who are concerned with the welfare of our forests.

Wood Exports vs. Munitions

We must not lose sight of the significance of wood in Canada's list of natural resources. Forest products are next in value to agriculture, the income being something over \$200,000,000 annually. In studying pulp and paper industry now brings into the country a larger income than any other manufacturing industry with the exception of munitions and is an outstanding example of an export business yielding real money in

distinction from war business largely based on domestic credits. At the present time it is out of the question to ship large quantities of wood products across the water and we see Europe being drained of its limited supply to feed the war machine. In the future the Empire will turn to Canada for its supplies, particularly for the valuable softwoods which fortunately predominate in this northern climate.

In considering the economies of forest products there are certain methods of utilization which are the main units and which are self-contained, such as lumber, pulp and paper, and wood distillation. The tendency has been to start with round wood from the forest for each process, so that control can be more certain and each plant can be independent. The possibilities for economy by co-ordinating one industry with another are becoming more apparent every day. The expansion of the main industries will bring about these new methods by very-reason of their size, so that there will be enough wood waste at one centre to serve as raw material for a by-product plant. Already the kraft

† "Present and Possible Products from Canadian Woods" by John S. Bates, Forest Products Laboratories of Canada, 700 University Street, Montreal.

pulp plants in the east convert large quantities of slabs and edgings; the saw mill waste in British Columbia offers opportunities for processes outside the range of the lumber industry. The practical requirement is that utilization must yield a financial profit. The close utilization in Europe is out of all proportion to Canadian conditions and we must wait for an increase and spreading of population. The rising cost of wood in Canada is in many ways a blessing and it is only right to place a real value on wood as it stands in the forest. As more and more by-product industries become feasible, the utilization of waste will bring true economy by throttling the drain on our forest supply.

A Permanent Forest

Looking at the problem in a broad way, the protection and reproduction of the forest overshadows all other duties. The most effective utilization of the wood and waste that is now coming out will not counterbalance the loss of forest wealth and the aim should be to build up in Canada a permanent and ever-expanding forest. It is to the foresters, the lumbermen, the federal and provincial governments that we must look for the carrying out of this policy. The public may well take a renewed interest in fire protection, forest reserves, tree planting, more rigid cutting laws, and measures for natural reproduction. Conditions are favored by the ownership of such large proportions of the forest areas by the governments.

Logging is such a definite proposition each year that it is hard to change the methods so long in use. We know that about 25 per cent. of the tree is left in the woods in the form of limbs, tops, stumps, etc. In general it is not likely that new processes will go far towards saving this material, because there is already so much by-product wood within easier reach at the manufacturing plants. Burning of slash in the wet seasons appears to be the main duty at present in order to curb forest fires.

New Conditions Ahead

The lumber industry has had a long history in Canada, but now faces new conditions. The manufacture has been so simple and the competition so light that lumbermen have not been forced to introduce radical changes. Although the plants are widely scattered and the number of specially trained men is small, it is not going too far to say that the lumbermen must get together for an intensive study of their industry. No outside forces can accomplish what they themselves can do by comparing the mechanical and physical properties of the different woods, extending the use of a species where this is legitimate, eliminating decay in lumber yards, kiln-drying and finishing woods to meet special requirements, selecting timber on the basis of quality and welcoming the co-operation of industries and experts for the conversion of waste. Saw-mill waste amounts to about 40 per cent. of the original tree and consists of slabs, edgings, trimmings, sawdust, bark, shavings, seasoning waste, shaping waste and culls. There are many chances for extending the by-product manufacture of small wooden articles by mechanical processes. A new development in Canada is the chipping and baling of saw-mill waste for shipment to chemical pulp mills. Spruce and white pine have been the main-stays of the lumber industry; Douglas fir is now coming to be recognized as Canada's foremost structural timber and the immense supplies in British Columbia will be a source of great wealth.

Openings for Enterprise

The pulp and paper industry is enjoying a development which is without parallel among the wood-using processes of the country. The export figures is now over \$50,000,000 annually, being half of the total export value of all forest products. The restrictions on pulpwood export and the duty free market for pulp and paper in the United States have rapidly increased manufacture within the country and the ratio is improving every year. From the simple ground-

wood process more and more attention has been turned to unbleached sulphite pulp, bleached sulphite pulp, kraft pulp, newsprint paper and high-grade papers. The production of soda pulp is still only 21 tons per day while the imports amount to something like \$500,000 per year, and there seems to be an opening for the utilization of some of the poplar which troubles the forester in connection with forest reproduction. Waste sulphite liquor still carries large quantities of wood material down the rivers but serious attention is being given to the possibilities of recovering ethyl alcohol, tanning solution and binders. Products of surprising variety can be made from kraft pulp and it is likely that paper twine, paper textiles and leather substitutes will be on our list of forest products in due course.

Acetone for War Uses

Among the distillation processes the destructive distillation of hardwoods is of main importance in Canada. It is gratifying that manufacture is carried beyond the stage of crude products and that the specially refined and derived products are made in Canada for both local and export trade. The process has been vital in that it has supplied practically all of the methyl alcohol and acetic acid, so essential in the scheme of modern civilization. The war has given a new stimulus by reason of the tremendous demand for acetone as a solvent in the manufacture of cordite, the well-known British propellant explosive. This same pressure has introduced in Canada new chemical processes for acetone and acetic acid which may have a serious effect on the distillation of hardwoods. While hardwood distillation is rather crude, it survives by reason of the variety of useful products—wood alcohol, emethyl acetone, formaldehyde, acetic acid, acetic anhydride, acetone, acetone oils, charcoal, creosote oils, etc. An important development is the Seaman process now established in the United States for the distillation of hardwood sawdust and finely divided mill waste.

Work of the Laboratories

In closing this brief discussion of a large subject I beg to refer to the work of the Forest Products Laboratories of Canada. As you know we are concerned with the varied problem of wood utilization. The fundamental basis is a study of the mechanical, physical and chemical properties of Canadian wood species. There are also investigations of processes and it is clear that many field studies will have to be made. In addition to the present Divisions of Timber Tests, Timber Physics, Pulp and Paper and Wood Preservation there is large scope for a Division of Lumber to properly serve the lumber industry in a technical way. It is impossible to talk of expansion under present war conditions, but it is right to plan. In playing a part in the better utilization of Canadian woods it is clear that we must have the full co-operation of foresters, as well as lumbermen and all others concerned with the handling of wood. There is a growing need for more detailed knowledge of our forest resources. Methods of utilization now known could in many cases be applied if there could be more discussion and a closer touch between woodsmen and process men. Foresters have raised the problems of punky poplar, balsam fir and birch and the utilization of hardwoods in connection with reproduction of softwoods. These are difficult questions but some action may follow from a better understanding of the situation. There is some indication that the large proportion of soluble matter in the decayed poplar may yield products of value. An attempt is being made to grind hardwoods for mechanical pulp.

WALNUT SCARCE FOR GUNS

Black walnut, which has always been the favorite wood for gun stocks on account of its failure to splinter badly when struck by a bullet or bit of shell, is extremely scarce at present. Birch and maple are being tried out by producers of hardwood lumber for this purpose.

Evergreen Snow Fences

BY J. E. LONG

Editor, Canadian Government Railways Employees Magazine, Moncton, N.B.

Praiseworthy Action Taken By Government Railway In Safeguarding Tracks For Winter Traffic.

Passengers travelling over the Canadian Government Railways are frequently heard commenting favorably on the fine appearance of the beautiful spruce hedges which line the right-of-way between Campbellton and Bathurst. To the traveller the appeal is purely to the esthetic sense, and the dense growth and well-kept appearance of these hedges rest the eye and captivate the sight in spite of the enchantment of the many natural beauties of mountain, bay and forest, with which the region is so generously adorned; but to the railway man they mean more than a decoration, as they are utilitarian as well. Here is the beautiful combined with the useful in the highest sense.

Primarily these hedges were designed to protect the Railways' tracks from the drifting snow in winter time; that they have grown beautiful is due to the great care with which they were planted, and tended by the sectionmen, and to the mellowing influence of the passing years. Now the Railway has natural snow fences, serviceable, efficient, beautiful, a combination well planned and patiently perfected.

To James Patterson, of Campbellton, retired roadmaster, is due in no small measure the credit as the originator of this improvement. In a recent interview, Mr. Patterson gave to the writer the following interesting information:

"The winter of 1887 was most severe, the snowfall was very heavy, and the high winds almost continuous. My men and I spent many days and nights endeavoring to keep the tracks clear of snow, so that the

trains might not be delayed or the cuts blocked with the heavy drifts. We did the best we could with the snow-fighting apparatus we had, but our best efforts were but feeble ones, and after some of the heaviest storms our wooden snow fences were completely buried, and the cuts snowed up full.

B. C. SPRUCE PRODUCTION

Recently the British Columbia Government passed the following Order-in-Council relating to greater spruce production in the province:

That the Minister of Lands be and is hereby authorized and empowered

(a) To forthwith arrange with the Imperial Munitions Board for the immediate logging of aeroplane spruce upon all areas of vacant Crown Land that may be judged suitable for the purpose by the Department of Lands, as well as upon Coal Leases, Coal Licenses and Mineral claims to which Crown Grant or Surface Rights has not been issued.

(b) To call upon all holders of Crown Timber held under License or Lease which is judged by the Lands Department to be suitable for the purpose to proceed immediately with the logging of aeroplane spruce and in default of compliance the Minister shall instruct the Department of Lands to arrange for such logging in co-operation with the Imperial Munitions Board.

(c) To arrange with the Imperial Munitions Board on equitable compensation to be paid for timber so cut from any license or lease.

Forests in Canada's Arctic

In an article in the Geographical Review by R. M. Anderson, giving an account of the explorations in the Canadian Arctic coast, the following data regarding "timber areas" are given:

"The northern limit of spruce trees on the Coppermine River is about 20 miles from the coast, although some stragglers are found growing 5 to 10 miles from the coast on Naparktokuok Creek, a few miles east of the river. Willows of good size, and from 10 to 15 feet high, are found in many places north of the tree line, and persist until they dwindle to small ground-creeping shrubs on the northern islands and wind-swept mainland coast.

"To the west there are no trees anywhere near the coast until we come to Franklin Bay, where we find spruce of fair size 10 or 15 miles inland, in the valley of Horton River. Spruce comes rather close to the coast on the Anderson River south of Liverpool Bay. Still farther west we find the great northward extension of timber in the Mackenzie delta, fair-sized trees occurring northward nearly to Richard Island about 150 miles north of the Arctic Circle.

"On the Horton River, the Coppermine River, around Dismal Lake, and to a less extent farther west, we often noted the large proportion (in some places 90 per cent.) of dead spruce trees near the northern limit of timber. There seemed little evidence of fire destruction, and the explanation that the northern regions are becoming colder and the vegetation retreating seemed inconclusive. On one of our winter trips Mr. Johansen accompanied a sledge party southward to the timber-line on the Coppermine River and made a careful study of conditions. He found that practically all the dead trees showed traces of the ravages of bark beetles, three species of them being found."

VON ALVENSLEBEN SOLD OUT

The case of the Red Cliff Land & Lumber Company vs. Alvo von Alvensleben has been before the British Columbia courts for almost two years but the end is now in sight. Alvensleben a German of high lineage who was in business in Vancouver is now interned at Salt Lake City having been located at Seattle for many months immediately previous to the United States entering the war. In 1911 he bought a large area of timber from the plaintiff company, the purchase price of which was in the neighborhood of \$2,200,000. At the outbreak of the war there had been paid \$1,700,000, and the original action was for foreclosure because of the final amounts owing under the agreement and also for interest. The application for fore-closure was abandoned because it would have been in the nature of a forfeiture and the action just decided was for a declaration of amounts due as a first lien against the property; that the property should be sold and that the plaintiffs should be permitted to bid on it at the sale. This the court allowed.

NEW OFFICERS C.S.F.E.

The following officers were elected at the Annual Meeting of the Canadian Society of Forest Engineers at the University Club, Montreal, Wednesday, February 6th.:

President, Ellwood Wilson.
 Vice-President, J. H. White.
 Secretary, Clyde Leavitt.

The meeting was a most successful one in every respect. Mr. W. F. V. Atkinson, Forester of the Spanish River Pulp and Paper Mills, Ltd., gave an excellent paper which will be reproduced in the next issue of the Forestry Journal.

STAG

CHEWING TOBACCO

"Ever-lasting-by Good"

has thousands and thousands
of friends who enjoy daily
its rich and
lasting flavor



Sold at
10c a Plug

Trees and National Character

Alexander von Humboldt has written, in his "Views of Nature," I think, that it is the vegetation of a country which produces the first and most lasting impression upon the mind of an observer. To credit that assertion, one must stop and reflect a moment. The more careful the consideration the more likely will one be to recognize the truth of Humboldt's statement.

In the cooler parts of the globe we have well marked contrasting groups of trees which grow in diameter by annual additions of new wood outside of the old wood and immediately under the bark, namely the broad-leaved deciduous trees—the oaks and hickories; and the trees which, in general, shed their leaves so slowly that they are called persistent-leaved trees, as the pines and spruce, in which the new leaves are on, before the old are off. At any season of the year one can hardly fail to observe the differences of appearance between an oak and a pine. One might almost say that they had but little in common beyond the fact that both were trees, so far as external appearance revealed. If, however, the view point were changed to a tropical region, a new type of tree would claim our attention. The simple beauty of the palms would attract us at once. To the palm we might add the tree fern, which though wholly unlike the palm in its structure and methods of reproduction, possesses a marked general resemblance in form, *i. e.*, in shape. The year through, the tropical forest would be perpetually evergreen. Here there are three distinct types which force themselves upon our notice at once.

Tree Impressions

In addition to these forms of deciduous leaved and "persistent-leaved" trees, there would be the topographical setting in which we found them, but a moment's thought will convince that it is the trees and

not the setting which produces the permanent mental picture, unless the topographical settings are different—as a winter street scene and a winter river view. But place both of our northern tree types on the same setting, and no matter how striking it would be, the trees would be the first to claim the observer's notice.

The exuberant growth of the tropics, produces one mental impression and the stern, harsh simplicity of a northern pine, or spruce forest, another each equally abiding, though quite different in kind.

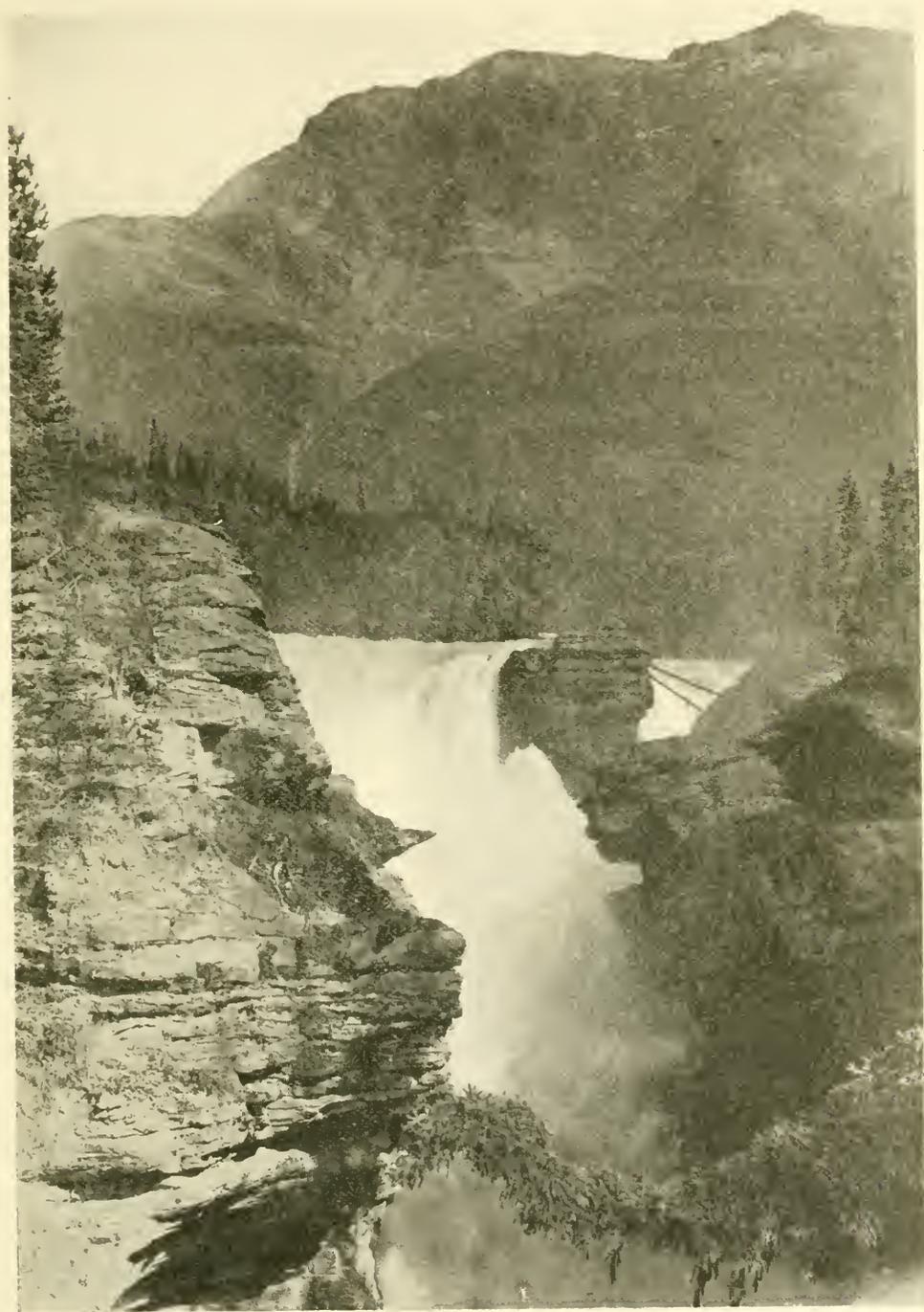
So much for the scene, in mass—the impression made, we may say, upon the ordinary observer. Beyond and deeper than this, however, are the sensations awakened in those who observe more minutely.

The "red-blooded man," who camps annually in the woods for the love of it, will recognize that his Camps in the pine or spruce forests differ in his memory from those made in the broad-leaved forests. This is especially true if he thinks of his winter camps, where he has a sense of protection under the evergreen foliage of the pines and spruces that is wholly wanting in the leafless forests of the broad-leaved trees. The passing storm has in each a different note. The bending snow-laden branches of the evergreen tree is a picture quite other than the rigid branches of the leafless tree, as but little snow can remain on the latter.

The Pine Woods Camp

Service recognizes finely the calm content of the pine woods camp, and describes it as only an outer, can:

"Here by the campfire's flicker,
Deep in my blanket curled,
I long for the peace of the pine-gloom
Where the scroll of the Lord is unfurled.
And the wind and the wave are silent,
And world is singing to world."



ATHABASKA FALLS, JASPER PARK

The real breath of the north, where the pine tree thrives, is in that utterance.

Parkman, the historian, from intimate knowledge of winter in the pine woods of the north, actually pictures the scene before one in a few graphic lines, thus: "Lakes and ponds were frozen, rivulets sealed up, torrents encased with stalactites of ice; the black trunks of the pine-trees were beplastered with snow, and its heavy masses crushed the dull green boughs into the drifts beneath. The forest was silent as the grave." And now:

"A song to the oak, the brave old oak,
Who hath ruled in the greenwood long."

The evergreen forest most appeals to one in the winter, when the deciduous trees are bare, resting in the semblance of death; but in the early spring when the sap flows again and life becomes manifest, I turn to the

broad-leaved forest for recreation, hope, and the renewal of life in which the very outermost twigs and buds are bathed. All through the summer one can watch the occurring changes: the developing leaves, the maturing fruit, the nesting birds. Even the light is brighter than in the dark evergreen forest. When autumn comes in the forest, when the leaves are

"Slain by the arrows of the early frost,"

nature caps the climax of her scenic glories in the coloring of the dying leaves, so that our last vision and final memories of them may be the brightest of the year.

To a visitor from the old world, where there is no such autumn coloring as here, the appearance of our scarlet oaks and our maples is unforgettable.

With that other type of trees, the palm and the tree fern, "Stepped in the Sun." We here have but little

STEREOPTICONS

Do you use a Lantern?

In School, in College or as a travelling lecturer?

The "MCINTOSH" Stereopticons will meet your ideal of what projection should be.

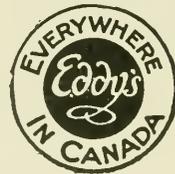
For thirty-nine years McIntosh lanterns have been demanded by the most discriminating users of the United States and Canada.

Let us know your requirements. Do you want an ideal instrument to project opaque objects? Or the most compact lantern in the world for travelling? Or a bigger machine with dissolving effects? Perfect lenses, high class workmanship, beautiful finish and at most reasonable prices.

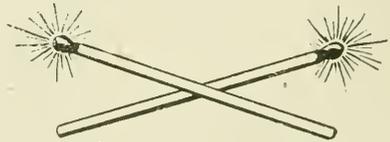
McIntosh Stereopticon Service

BOOTH BUILDING - - - OTTAWA

ASK



FOR



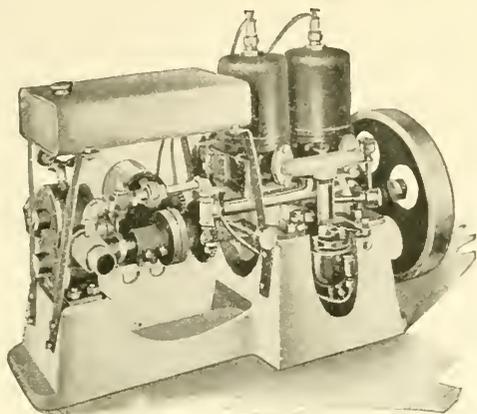
Dry Matches

After all day in a boat, rainstorm or wet snow. Ask your dealer for

MARBLE'S WATERPROOF MATCH BOX

If he can't supply you, we will send prepaid for his name and 50 cents. Dry matches may save your life.

MARBLE ARMS MFG. Co.
Dept. 5160 Gladstone, Mich., U. S. A.



FAIRBANKS-MORSE FIRE FIGHTING ENGINES

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

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

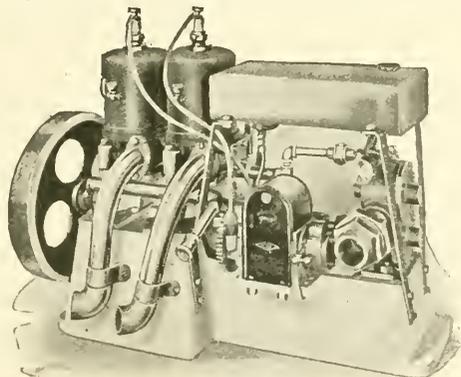
Governments and Private Owners of Forests everywhere, can materially reduce their fire losses by the use of these outfits.

Full information and prices on request.

THE CANADIAN FAIRBANKS-MORSE CO., Limited

MONTREAL - OTTAWA

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



to do, though the palm is scantily represented on our southern coast. I have watched the cocoanut palm, with its restless foliage swaying in the ever present land, or sea breeze of the ocean shore. But this has not altered in my mind the idea of tropical rest, for I see that the motion is produced by a force outside of the palm. Nor can I escape the idea that the tropics, where the palm flourishes is the land of little achievement; where God has been too

kind for man's own good. True, this has little to do with the trees themselves, for their activities may be great. It is possible, however, for one from long habit to look at trees as helping to form human habits and so forming human history. If such association can be tolerated, it is easy to look upon all tropical life, plant and animal, as lacking the vigor and helpful productiveness of the land of the oak and the pine.

J. T. R. in "Forest Leaves."

Forests, The Keystone of War

BY PROF. J. W. TOUMEY,

DEAN OF YALE FOREST SCHOOL

"Victory is with the army whose country has the greatest iron mines and smelters, the largest area of waving grain and abundance of wood. Of all the products of the soil upon which the very life of a nation depends in times of war, wood is the only one that cannot be rapidly increased under necessity and by the employment of adequate labor. Therefore, provision for adequate national defence necessitates the maintenance of vast reserves of timber throughout the nation, reserves from which billions of feet can be drawn in a single year if necessary to meet the needs of the army and navy.

A sane and conservative development of forest resources to meet the needs of the nation in times of peace necessitates a constantly increasing intensity of management of all absolute forest land and the building up and maintenance of an enormous forest capital. Please remember this forest capital can be drawn upon in times of war and may determine the fate of the nation.

England has for centuries neglected her forests and for generations has obtained most of the wood used in her buildings and industry from beyond the sea. The stress of war found her with a meagre forest

capital, and New England's sons—many of them New Hampshire boys, are today felling the remnant of the forests of that proud country that the empire may live. When the sombre clouds of war are lifted from Europe's battlefields and peace again rules over the earth, England's lesson, learned in this bitter strife, will be taken to heart by her people and forests will clothe her idle lands. A forest capital, far beyond that of former days, will not only add to her economic development in times of peace but be developed and maintained, to better insure her against vital needs in times of possible future strife.

France has been more far-seeing in her forest policy, and, next to Germany, has been the most successful nation in Europe in the economic development of her non-agricultural lands for the production of timber. When the war broke out she had a forest capital that under the necessity of strife could be drawn upon for vast supplies of wood necessary for mining, transportation and trench construction, all vital to her very existence. If the French had had no forests at the outbreak of the war, France would be devastated today and the nations of middle Europe feasting in the halls of Paris.

10 MILLIONS FOR PLANTING

No limit will be set this year on the number of forest tree seedlings by the Pennsylvania Department of Forestry for free distribution. Anyone who wants to plant trees this spring may have them for the asking. The only condition being that application for less than five hundred trees will not be filled; applicants must pay for packing and transportation, and the trees may not be sold, but must be actually planted in Pennsylvania for reforestation. No applications can be filled for ornamental trees.

The State Forest nurseries have

raised more trees last year than ever before; but so many of the foresters have enlisted, and so few laborers are available, that the number to be planted on the State Forests probably will be even less than last year. Over 10,000,000 trees are ready to set out next spring, and as many more are in the nurseries, but are too small to plant this year.

The stock available for free distribution is almost all three years old, and includes white pine, Scotch pine, red pine, pitch pine, Norway spruce, European larch, Japanese larch and red oak.

Try This Stump Puller at Our Risk The Smith Stump Puller will take out every tree and stump by the roots, clearing from one to three acres a day, doing the work of twenty men. We want you to send for our 3 year guarantee against breakage and our free trial proposition. Address: **W. Smith Grubber Co.**, 11 Smith St., LaCrescent, Minn.



TREES, SHRUBS AND SEEDS
 Hardy Northern Trees and Shrubs at Lowest Prices. Native and Foreign Tree Seeds
EDYE-DE-HURST & SON, DENNYHURST DRYDEN, ONT. Shippers to H. M. Government, Etc. Correspondence Francaise.

YALE UNIVERSITY FOREST SCHOOL
 NEW HAVEN, CONNECTICUT, U.S.A.

Hill's Seedlings and Transplants
 ALSO Tree Seeds for Reforesting. Best for over half a century. Immense stock of leading hardy sorts at low prices. Write for price list and mention this magazine. Forest Planters Guide Free.
The D. Hill Nursery Co., Evergreen Specialists
 Largest Growers in America.
 Box 503 Dundee, Ill., U.S.A.

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

For further information address
JAMES W. TOUMEY, Director
 New Haven - Connecticut

PERFECTION SLEEPING BAG WITH PNEUMATIC MATTRESS

These evenly-soft air mattresses may be used on damp ground with perfect safety—they are non-absorbent. And they are absolutely sanitary, with no place for dust or vermin to collect. Easily deflated and inflated—may be rolled into a small light bundle and easily carried in and out of the house. Last indefinitely. Invaluable for motor, yachting and camping trips. Endorsed by the Federal Government.

Write for Catalog and endorsements to-day.

Pneumatic Mfg. Co. 537 17th Street, BROOKLYN, N.Y.



CONFEDERATION LIFE ASSOCIATION UNCONDITIONAL ACCUMULATION POLICIES

Are liberal up-to-date contracts which guarantee to the insured every benefit consistent with safety.

Write for Particulars which will gladly be furnished by any representative of the company or the
HEAD OFFICE, TORONTO



QUEEN'S UNIVERSITY

KINGSTON
ONTARIO

ARTS MEDICINE
EDUCATION
APPLIED SCIENCE

Mining, Chemical, Civil, Mechanical and
Electrical Engineering.

HOME STUDY

Arts Course by correspondence. Degree with
one year's attendance.

Summer School **Navigation School**
July and August. December to April.

J. E. O. Y. CHOWN,
Registrar.

MINIATURE CONSTRUCTION

Landscape, Mechanical and Architectural Models, Topographical Maps and Paintings, for

SCHOOLS — COLLEGES — MUSEUMS
Government work a specialty

MORGAN BROS. CO., Inc.
MODEL MAKERS

Room 1650 Grand Central Terminal
Phone 7720 Murray Hill

NEW YORK CITY

UNIVERSITY OF NEW BRUNSWICK

FREDERICTON, N.B.

DEPARTMENT OF FORESTRY
Established in 1908

Best of facilities for definite instruction and supervision in Practical Forestry.

Surveying, cruising and construction work carried on in our own tract of 3600 acres, with Forestry Camp in the centre.

Competent men from the School at present in demand to take up Forest Survey work with the Provincial Crown Land Department.

For further information address :

DEPARTMENT OF FORESTRY

University Calendar furnished on application.

C. C. JONES, Chancellor.

R. O. SWEEZEY

B. Sc., M. Can. Soc. C. E.

CONSULTING ENGINEER.

Water Powers. Timber Lands.
Forest Industries.

164 St. James St. MONTREAL.

FOREST BRANCH ROLL OF HONOR

The British Columbia Forest Branch during the past three years has furnished a large percentage of recruits for service overseas, the staff in all parts of the province having frequently been reduced to skeleton proportions by the frequent enlistments. Casualties have been many and some of the wounded foresters have already been returned from the front as unfitted for further service. Fourteen of the gallant fellows will return no more, having given their lives in the cause of freedom. The honor roll to date is as follows:

Capt. J. B. Mitchell, M.C., Lieut. J. R. Chamberlin, F. B. Wheatley, A. J. Pickup, V. K. Wood, A. Rees, W. A. Boulton, P. Johnston, V. A. Harvey, N. F. Murray, R. F. Irving, P. McLennan, G. R. Malcolm, and Mr. Ash.

Lieut. J. R. Chamberlin, of the Royal Flying Corps, was the only officer whose remains were sent back to Canada for burial.

LAUNDRY BILLS AND FORESTS

Who would think of attributing increased laundry bills to the forest? And yet acetic acid, so necessary to the cleaning of linen, is indirectly a forest product and has grown remarkably scarce.

The U. S. government needs every ounce of acetone that acetic acid can furnish.

"Part of the reason why some laundries have advanced the price to four cents each for collars became apparent on Saturday," remarks the Philadelphia Ledger, "when it became known that the United States Government was likely to take over control of the acetic acid industry on very much the same lines which have been applied in the case of ammonia.

"It is understood that the Government, in the interest of obtaining an adequate supply of acetone for war purposes, has undertaken to control the distribution of acetic acid throughout the country, and that word to that effect, if it has not al-

ready been circulated among the trade, will be sent out this week. Acetic acid has long been a standard chemical in the cleaning of collars and other white goods.

A minor effect is likely to be seen in the production of benzoates, notably benzoate of soda; which is largely used by some manufacturers of foods. Acetic acid is largely used in the manufacture of synthetic benzoates, and Federal control may cut down the production."

Hardwood distillation yields raw pyroligneous acid, wood gas and charcoal from beech, birch and maple. From the tar of the pyroligneous acid come wood tar, acetate of lime and wood alcohol. From the acetate of lime, acetic acid is made.

From acetic acid, acetone is made and used in manufacture of the high explosives, known as cordite and lyddite. Just now there is an enormous demand for acetone in manufacture of cordite.

Wood alcohol is various degrees of purity enters into the production of aniline dyes, formaldehyde, photographic films and smokeless powder.

TROPICAL FORESTS

There are at least two very large forest regions in the tropics. These are the Amazon region of South America and the Indo-Malay region of southeastern Asia and adjacent islands. The forested region of the Amazon River basin comprising an area of 1,600,000 square miles is the largest in the world. The forested area of Borneo Sumatra the Philippine Islands the Malay Peninsula and Burma is roughly estimated to be not less than 500,000 square miles, or nearly as large as that of the United States. Thus the forested area of these two tropical regions alone comprises more than 2,000,000 square miles. Contrary to the usual opinion it is claimed that tropical forests are not all composed of hard woods fit only for special purposes, but that they have a much larger percentage of soft and medium hard woods which it is quite practicable to develop economically.

Useful Forestry Books

FERGUSON—FARM FORESTRY

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

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

KINNEY—THE DEVELOPMENT OF FOREST LAW IN AMERICA

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

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

KINNEY—THE ESSENTIALS OF AMERICAN TIMBER LAW

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

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

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

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

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

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

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

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

TAYLOR—HANDBOOK FOR RANGERS AND WOODSMEN

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

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

P. L. BUTTRICK

CONSULTING FORESTER
NEW HAVEN, CONN., U. S. A.
P. O. BOX 607

TIMBER ESTIMATES
UTILIZATION STUDIES
PLANTING PLANS
Landscape and General Forestry
Work.

Eight years experience in practical
forestry work of all sorts.

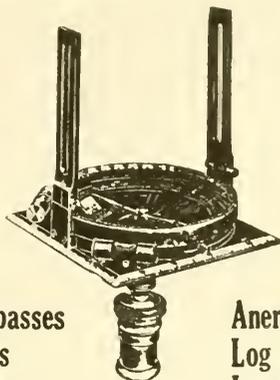
PHILIP T. COOLIDGE
FORESTER

Timber Estimating and Mapping.
Supervision of Lumber Contracts.
Surveying. - - Forest Planting.

STETSON BLDG., 31 CENTRAL ST.
BANGOR, MAINE.

FORESTERS AND RANGERS

EVERYTHING YOU NEED
CAN BE SUPPLIED BY US



Compasses
Tapes
Scribes
Transits
&c.

Aneroids
Log Rules
Lumber
Gauges
Levels, &c.

The Ontario Hughes Owens Company
529 Sussex St. OTTAWA, ONT.

50^{CTS.}

WAR TIME SPECIAL OFFER

**ONE WHOLE YEAR
FOR FIFTY CENTS!**

We are desirous of adding 1,000 new names to our
list this month and to make it a certainty that we
will not be disappointed we are offering

ROD AND GUN

IN CANADA

to you and 999 others for Twelve Months for 50 cents.

W. J. TAYLOR LIMITED, Publisher - Woodstock, Ont.

A Live Book on Our Wild Animals at a Bargain Price!



In the long winter evenings there is opportunity for burnishing up your half-forgotten knowledge of our Canadian wild animals and for learning a hundred things you never suspected before.

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

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

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

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

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

.....
Canadian Forestry Journal, Ottawa.

Please send copy of 'The Animal Guide' in leather binding to the following address. One dollar is enclosed.

Name.....

Address.....

A Special Message!

The National work of the Canadian Forestry Association depends upon prompt receipt of all the annual fees. Make the 1918 remittance a "Contributing Membership" at five dollars if you possibly can.

The Forestry Journal is only one feature of your membership. You are a partner in the widespread educational work, so essential to progress in forest conservation. Part of your fee goes to pay for our propaganda.

Make it a "Contributing Fee" if you think you can afford the amount for genuine national service.

R. R. BRADLEY

Forest Engineer and Mem. Can. Soc. of F. E.
Consulting Forester to the New Brunswick Railway Co.

Timber and Pulpwood Estimates. Forest Maps. Advice on the Management of Wood Lands. Timber lands listed for sale.

GLOBE ATLANTIC BUILDING, ST. JOHN, N.B.

SEEDING and PLANTING IN THE PRACTICE OF FORESTRY

By James W. Toumey, M.S., M.A., Director of the Forest School
and Professor of Silviculture, Yale University.

This book presents both the details of practice, and the fundamental principles that control success and failure in the economic production of nursery stock and the artificial regeneration of forests. It explains the why as well as the how.

Part I. deals with the silvical basis for seeding and planting, more particularly the principles which underlie the choice of species, the closeness of spacing and the composition of the stand.

Part II. is descriptive of the various operations in artificial regeneration and the results that may be expected from the best practice.

Chapter Headings of This Book:

Part I. Silvical Basis for Seeding and Planting.

Chap. I. Definitions and Generalities.

II. }
III. } The Choice of Species in Artificial Regeneration.

IV. The Principles which Determine Spacing.

V. The Principles which Govern the Composition of the Stand.

Part II. The Artificial Formation of Woods.

VI. General Considerations.

VII. }
VIII. } Forest Tree Seed and Seed Collecting.

IX. The Protection of Seeding and Planting Sites.

X. Preliminary Treatment of Seeding and Planting Sites.

XI. Establishing Forests by Direct Seeding.

XII. to XV. The Forest Nursery.

XVI. to XVII. Establishing Forests by Planting.

xxii+454 pages, 6 by 9, 140 figures. Cloth, \$3.50 net.

Canadian Forestry Journal

206-207 Booth Bldg., OTTAWA.



PETERBOROUGH CANOES

For service our Canvas Covered Canoes are unequalled. We make a complete line of Canoes, Skiffs and Motor Craft. Our catalogue will be of interest to you.



Peterborough Canoe Co., Ltd., Peterborough, Canada



(Successors to Metropolitan Air Goods Co.)

SLEEP ON AIR with a COMFORT SLEEPING POCKET

Recommended by the Forest Service, Campers, Physicians, Invalids, Tuberculosis Patients and Sportsmen everywhere. A warm, dry, comfortable bed. Wind, rain, cold and water-proof. Packs 6 x 25. Air goods for home, camp, yacht, canoe, etc. Illustrated Circular Free by mentioning Canadian Forestry Journal.

ATHOL MANUFACTURING CO.,
ATHOL, MASS., U.S.A.,

Dealers write

FOREST TELEPHONES



Make the life of the forester better worth living. They relieve him from the appalling loneliness. They help him to keep in human voice touch with foresters miles away.

In emergencies—fire—sickness—hunger—the speed with which they can summon help is marvellous.

Write for full particulars of how to install the Northern Electric Forest Telephone System. Address the Office nearest you.

Northern Electric Company
LIMITED

Montreal
Halifax
Ottawa

Toronto
London
Winnipeg

Regina
Calgary
Vancouver

Northern · Electric · Forest · Telephones ·

Canadian Forestry Journal

Vol. XIV.

MARCH, 1918

No. 3



FACULTY OF FORESTRY

FEB 24 1919

UNIVERSITY OF TORONTO

AN INDIAN FIRE RANGER'S ADVISORY BOARD, IN NORTHERN QUEBEC

Canadian Forestry Journal

CIRCULATION 6500 COPIES MONTHLY

Vol. XIV

WOODSTOCK ONT., MARCH, 1918

No. 3

CONTENTS FOR MARCH

“Money in the Maple Bush”

by the Editor.

“The Forests of Canada in Peace and War”

By Robson Black, Secretary Canadian Forestry Association.

“Flying Patrol for Forest Protection”

By Major K. E. Kennedy, Royal Flying Corps.

“Choosing Trees for Ornamental Planting”

By Odilon Bedard F. E., Quebec.

“The Forester’s Place in the Planning and Operating of Wood Industries”

By W. F. V. Atkinson, F. E.

“Britain’s Penalty for Neglected Forests”

By Sir John Stirling-Maxwell.

“High Prices Make Farm Forestry Possible”

“Canada’s Profits from Her Forests”

“How to Cut a Woodlot”

“Heading Off the Fire Season”

“Know These Facts About Your Cordwood”

“A Community Wood-Chopping Day”

“Where is the Fuel for Next Winter?”

“Millions of Waste from Wood”

“British Columbia Forest Facts”

“Patronage Makes Farewell Bow”

War Front Letters from Forestry Men

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

Address all Communications to

THE CANADIAN FORESTRY JOURNAL

206-207 BOOTH BUILDING, OTTAWA

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

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

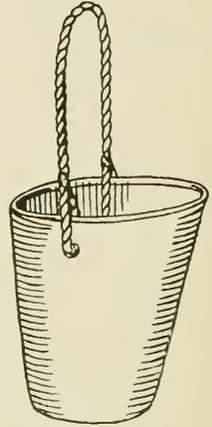
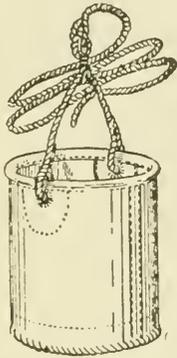
Galbaduk
TRADE MARK

Salvage Covers

and

Water Pails

Fill Your Every
Requirement



SEND FOR SAMPLES

Wood's Manufacturing Co., Ltd.

—Successors To SMART-WOODS, LTD., Ottawa, Canada.—

THE UNIVERSITY OF TORONTO

AND

UNIVERSITY COLLEGE

WITH WHICH ARE FEDERATED

VICTORIA, TRINITY, ST. MICHAEL'S
KNOX and WYCLIFFE
COLLEGES

FACULTIES OF

ARTS

APPLIED SCIENCE

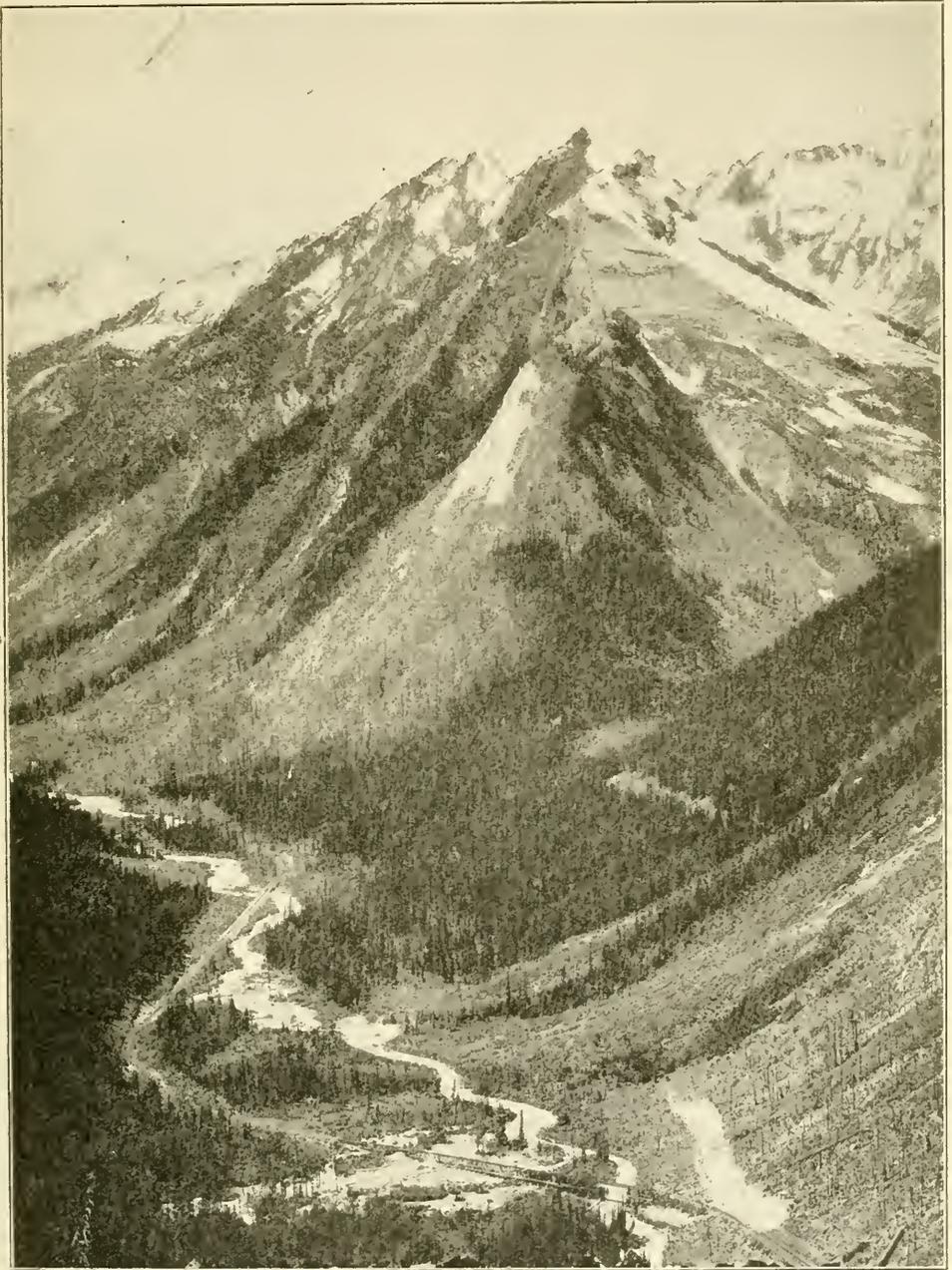
MEDICINE

EDUCATION

HOUSEHOLD SCIENCE

FORESTRY

For further information, apply to the Registrar of the University,
or to the Secretaries of the respective Faculties.



LOOKING ACROSS ILLECILLEWAET VALLEY, BRITISH COLUMBIA



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



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

Money in the Maple Bush

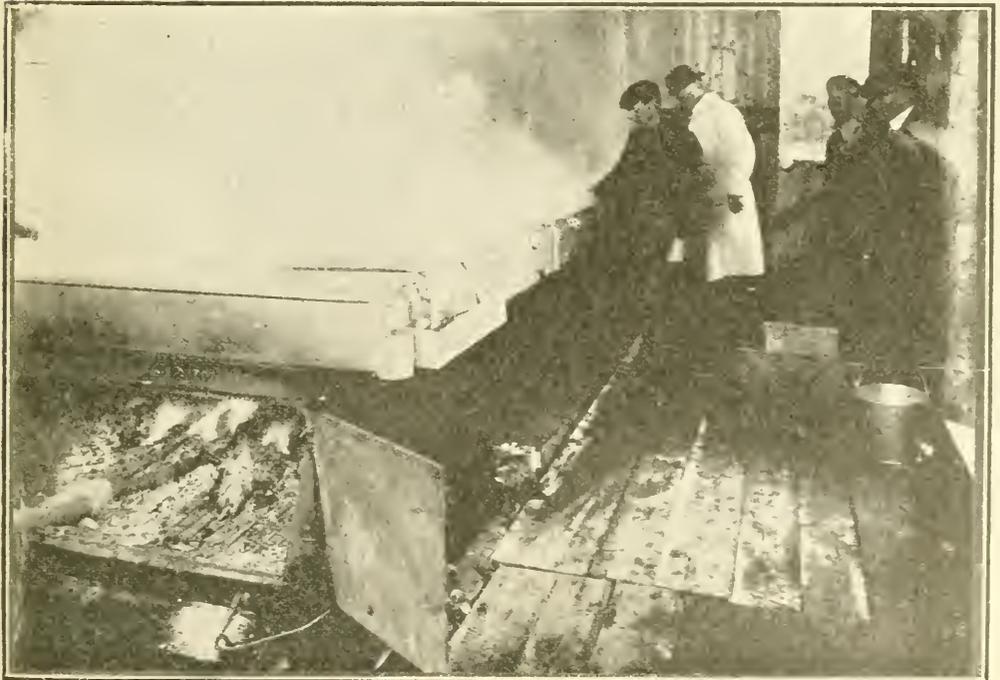
BY THE EDITOR

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

55,000 in the Sugar Trade

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

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



BOILING DOWN THE SAP IN A MODERN QUEBEC SUGAR CAMP

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

Adulteration Discouraged

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

Indian Methods

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

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

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

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

\$30 an Acre

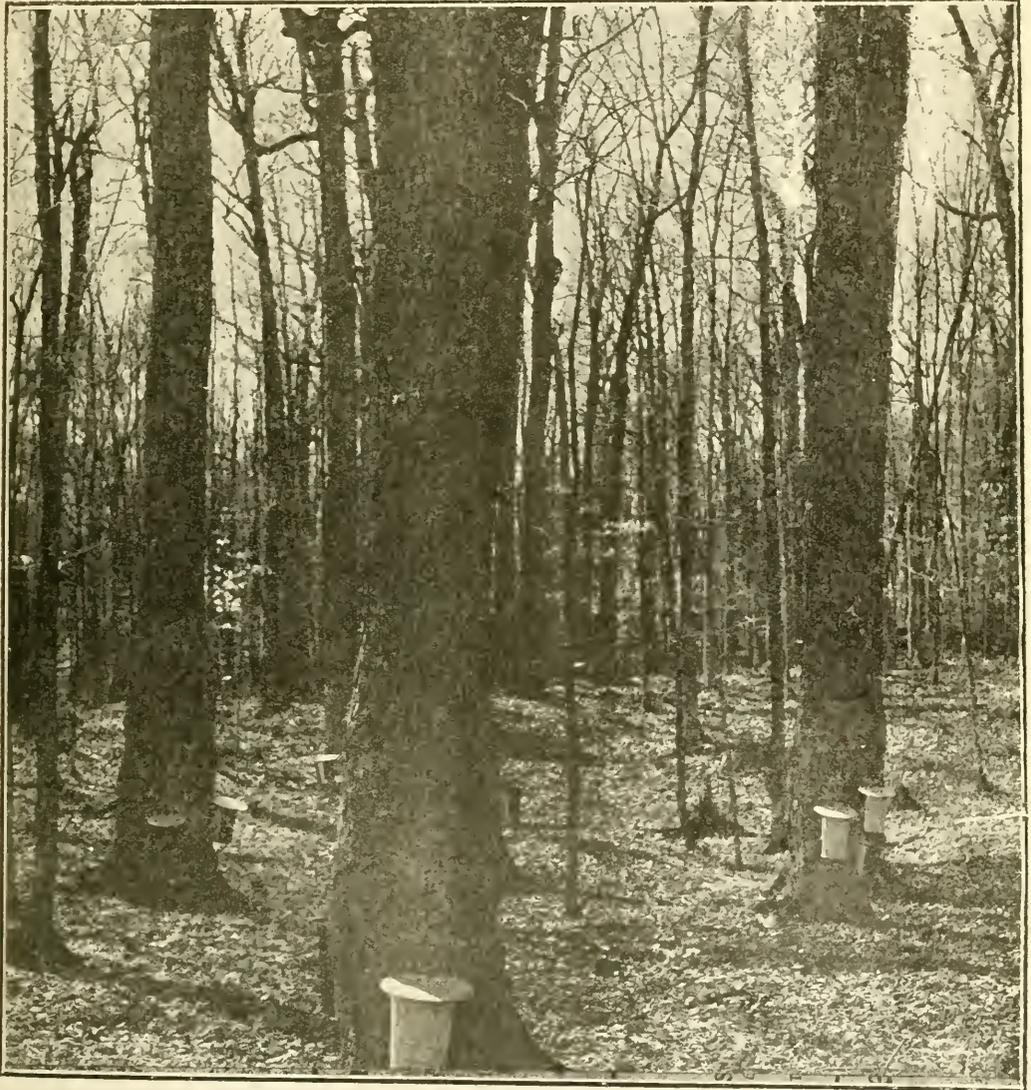
If a high quality of sugar and syrup are made, 100 trees per acre, with an average of 2 pounds of sugar per load selling at 15 cents a pound, the results would be an income of \$30 per acre on practically waste land, giving the farmer good returns for his labor.



STARTING THE SAP FLOW

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

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



A QUEBEC MAPLE BUSH DURING THE SUGAR MAKING SEASON

The Forests of Canada in Peace and War

BY ROBSON BLACK

Secretary, The Canadian Forestry Association, Ottawa

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

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

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

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

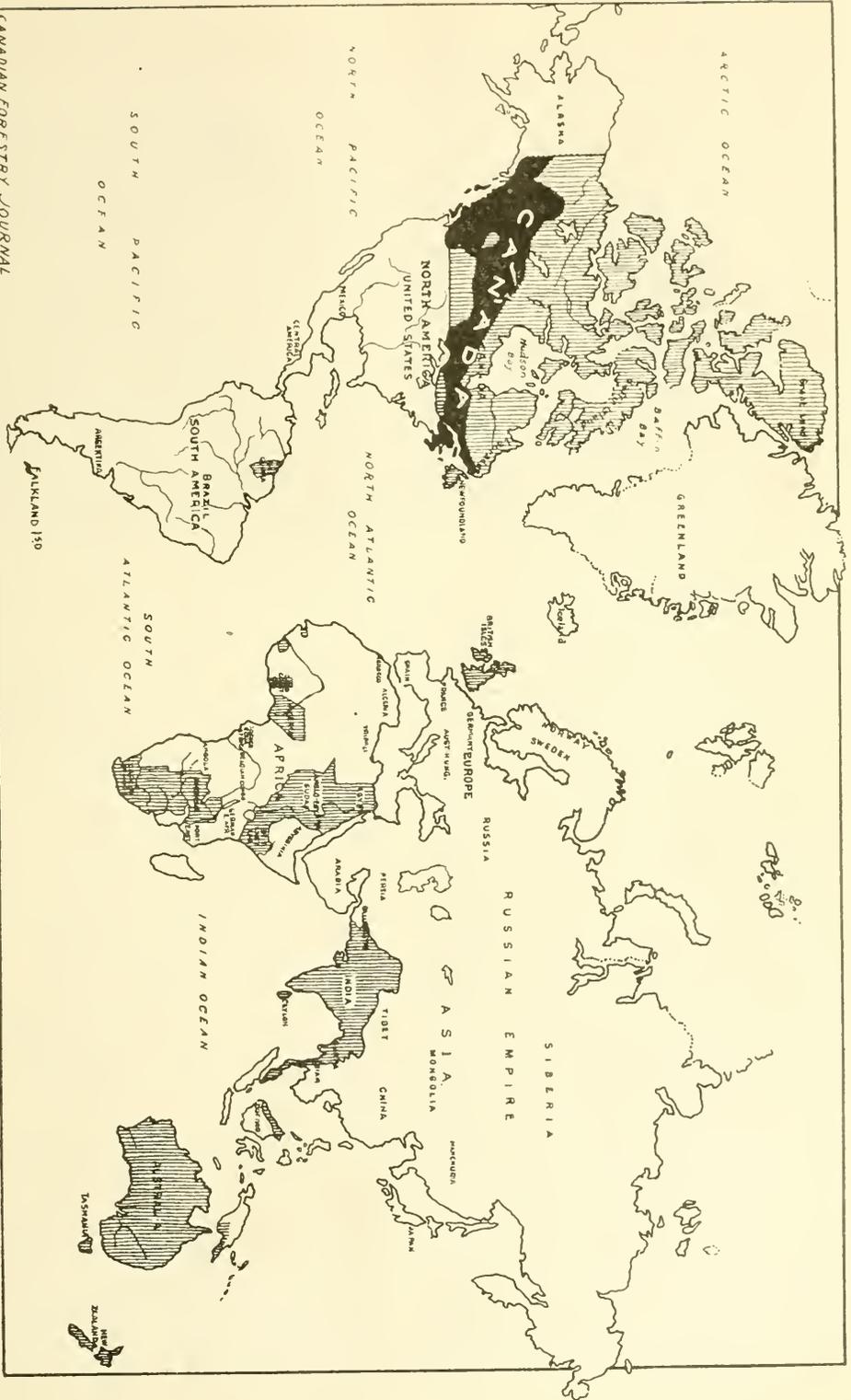
John Bull in time of war found the problem of getting timber supplies as great a source of worry as his shell output. Ships could not be spared for transporting such bulky cargoes across the Atlantic, or even the North Sea. Premier Lloyd George repeatedly expressed anxiety over the maintenance of timber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

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

When the War Ends, What?

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

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



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

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

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

Look at the map once more!

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

The Printer and the Tree

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

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

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

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

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

The Road of Destiny

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

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



ATHABASCA VALLEY, JASPER PARK, B. C.

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

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

The Wherefore of Profits?

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

for a thriving and contented population.

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

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

What of Foreign Trade?

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

abroad will rest upon certain main ingredients of trade:

Agricultural Exports.

Forest Exports.

Exports of Manufacturers.

Fisheries Exports.

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

Partners in a Public Cause

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

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

The Way of Working

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

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

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

Look the Map Over Again

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

41 DAILIES IN ONE CITY

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

GERMANY'S PAPER DECLINE

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

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

High Prices Make Farm Forestry Possible

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

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

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

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

How to Cut a Woodlot

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

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

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

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

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

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

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

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

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

8. Cut suppressed, dead-topped,

crooked, forked, knotty, hollow and punky trees.

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

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

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

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

12. Keep fire out of the woods absolutely.

Know These Facts About Cordwood

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

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

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

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

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

A Community Wood-Chopping Day

By Kenneth B. Welles in the "Outlook."

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

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

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

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

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

Routing out Citizens

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

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

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

Lighting the Fuse

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

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

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

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

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

Starting for the Woods

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

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

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

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

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

Mixed Company

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

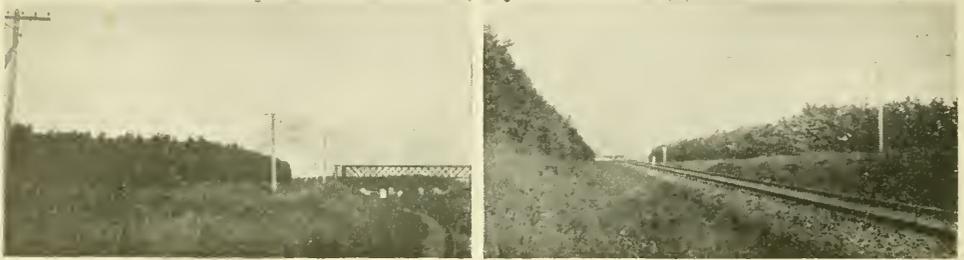
the farmer from South Lyme, never knew before what a good fellow an artist is apt to be. The artists never imagined before that there are knack and genius in the woodman. We chaffed each other, liked each other, and reveled in the company. We luxuriated around the fire, all except a few whose axes we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

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

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

A Word for Greenhorns

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



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

Where is the Fuel for Next Winter?

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

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

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

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

Flying Patrol for Forest Protection

BY MAJOR K. E. KENNEDY, ROYAL FLYING CORPS

In an Address before Quebec Forest Protective Association, Montreal.

(Concluded from February Issue.)

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

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

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

THE PRESIDENT: But we have no maps.

Making Maps in the Air

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

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

Carrying Men

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

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

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

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

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

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

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

Landing in Running Streams

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

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

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

Over the Heads of Infantry

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

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

Getting Messages Back

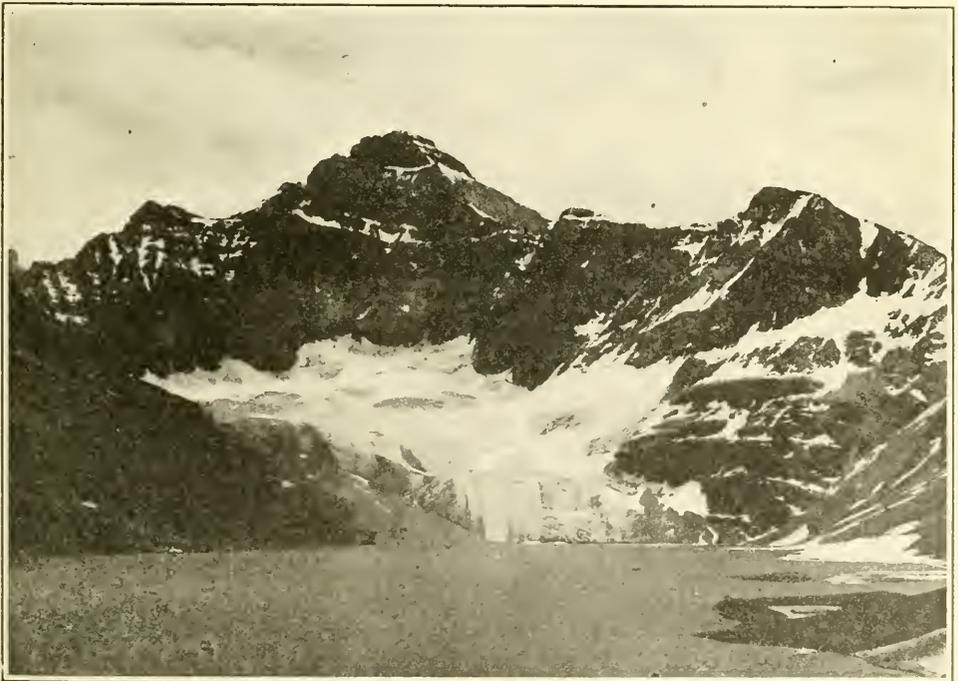
In advance movements the infantry in some parts of course go faster than others, and it is absolutely necessary for the safety of the troops that the higher command, miles further back, should know exactly at what point each unit is, and which sections need to be reinforced. There

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

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

Alighting in Water

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



LAKE McARTHUR, TRAIL 24, BRITISH COLUMBIA

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

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

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

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

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

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

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

Flying in a Gale

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

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

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

MR. POWER: Yes, about that.

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

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

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

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

An Egyptian Test

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

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

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

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

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

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

LAURENTIAN'S FINE YEAR

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

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

A Partnership Suggestion!

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

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

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

Millions Lost in Waste Wood

What Investigative Science is doing to turn Rubbish into Real Money

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

Making Alcohol

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

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

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

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

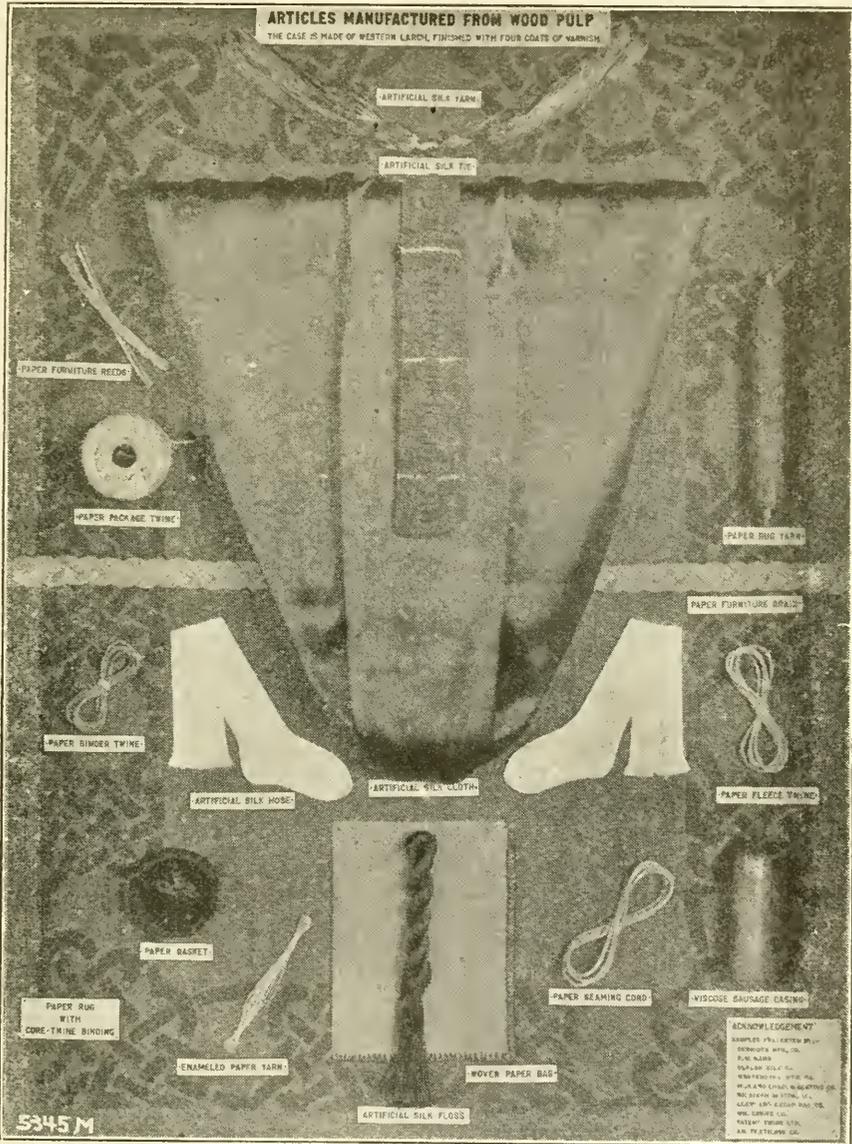
Dyestuffs Produced

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

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

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

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



Courtesy "Southern Lumberman"

SOME UNUSUAL PRODUCTS OF THE LOG

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

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

Replacing Silk Worms

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

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

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

Laboratory Work Essential

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

CUT WILLOW FOR LIMBS

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



THE VALLEY OF THE KENNEBECASIS

Choosing Trees for Ornamental Planting

BY ODILON BEDARD. F. E., QUEBEC

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

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

Fruit Trees for Yellow Soils

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

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

Aesthetic Values

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

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

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

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

Oak, Basswood and Poplar

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

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

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

Beech too Slow

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

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

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

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

LT. W. E. DEXTER IN GOOD HEALTH

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

"A WELCOME VISITOR"

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

Yours truly,

(Signed) Arthur Boyer.

Montmartre, Sask.

British Columbia Forest Facts

By the Editor of "Industrial Progress"

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

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

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

Who Owns It

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

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

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

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

What it Brings

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

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

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

"Patronage" Makes Farewell Bow

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

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

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

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

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

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

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

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

When Grand Trunk Ran on Cordwood

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

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

“Forest Talks” to School Children

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

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

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

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

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

By W. F. V. ATKINSON, F. E.

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

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

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

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

Watershed Conditions

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

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

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

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

Questions for the Forester

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

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

use of the xylometer, these factors are now available.

Insurance of Investments

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

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

Cheap Transport

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

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

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

Harvesting Poplar

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

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

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

What Markets?

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

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

Large Staff Demanded

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

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

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

War-Front Letters from Forestry Men

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

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

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

CUTTING ROAD PLANKS.

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

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

HUN DEVASTATIONS.

Quarter Master Sergeant S. H. Clark,

Canadian Forestry Corps, France:

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

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

TRAINING FOR A BUS.

Lieut. D. A. MacDonald, Royal

Flying Corps, England:—I completed a six weeks' theory course on

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

FLYING IN B. C. SOME DAY.

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

NOT A TREE LEFT STANDING

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

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

A TIMBER MAGAZINE.

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

COTTONWOOD FOR PULP

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

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

Britain's Penalty for Neglect of Forests

BY SIR JOHN STIRLING-MAXWELL

In a Recent Address before Royal Arboricultural Society of Scotland

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

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

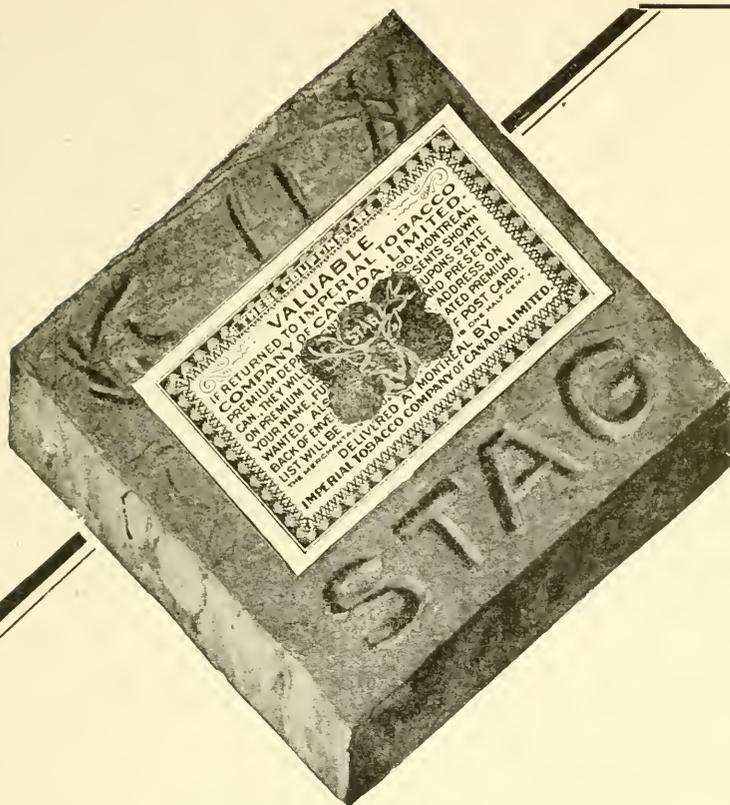
Britain's Penalty, £ 40,000,000

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

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

No Longer a Game of Chance

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



STAG

CHEWING TOBACCO

"Ever-lasting-ly Good"

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

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

When Peace Comes

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

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

Pine Blister a Mighty Menace

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

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

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

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

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

RENNIE'S SEEDS

For Better Gardens

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

**For
Planting
Mar. 1st
to
Apr. 15th
Order
NOW!**

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

★★ **LOOK FOR THE STARS** ★★

Our 1918 Catalogue should be in your hand by now. It is your patriotic duty to consult it at every opportunity. Our Government insists we must produce more. Start right, then, and be sure and sow good seed—RENNIE'S SEEDS. Look for the special star border bargains in our Catalogue—it will pay you to do so.

THE WILLIAM RENNIE COMPANY LIMITED.
KING & MARKET STS TORONTO
 ALSO AT MONTREAL WINNIPEG VANCOUVER

A Forester's Impression of England

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

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

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

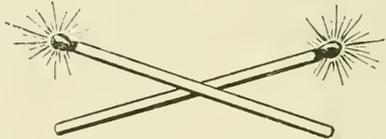
on the carriage and so help the poor fellow at the windlass win through.

An Even-aged Stand

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

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

ASK  FOR





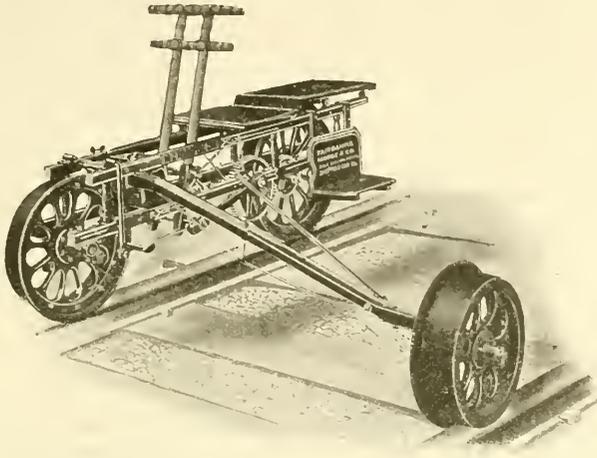
Dry Matches

After all day in a boat, rainstorm or wet snow. Ask your dealer for

MARBLE'S WATERPROOF MATCH BOX

If he can't supply you, we will send prepaid for his name and 50 cents. Dry matches may save your life.

MARBLE ARMS MFG. Co.
Dept. 5160 Gladstone, Mich., U. S. A.



F-M Speeder

Easy Running---Durable

The F-M Speeder is easy running and durable because it is carefully built and it is equipped with ball bearings and accurately machine cut gears.

These machines aid Government and Railway Forestry Officers to easily cover their routes and reach an objective quickly.

*For Further Information please
address our nearest house. . .*

The Canadian Fairbanks-Morse Co., Limited

"Canada's Departmental House for Mechanical Goods."

St John, Quebec, Montreal, Ottawa, Toronto, Hamilton,
Windsor, Winnipeg, Saskatoon, Calgary, Vancouver, Victoria

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

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

New Lecture Sets for Western Canada

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

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

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

8 Lectures a Week by Travelling Outfits

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

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

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

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

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

FROM NEW BRUNSWICK.

Woodstock, N.B.,

January 1st, 1918.

Canadian Forestry Association:
Ottawa.

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

G. W. SLIPP.

UP-TO-DATE WOODSMAN

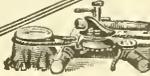
He was preparing his home lessons. His father, a struggling tradesman, was listening to him reciting some poetry:

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

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

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

Try This Stump Puller at Our Risk The Smith Stump Puller will take out every tree and stump by the roots, clearing from one to three acres a day, doing the work of twenty men. We want you to send for our 3 year guarantee against breakage and our free trial proposition. Address **W. Smith Grubber Co.** 11 Smith St. LaCrescent, Minn.



TREES, SHRUBS AND SEEDS
H. L. Hardy Northern Trees and Shrubs at Lowest Prices. Native and Foreign Tree Seeds
EDYE-DE-HURST & SON, DENNYHURST
DRYDEN, ONT. Shippers to H. M. Government, Etc. Correspondence Francaise.

YALE UNIVERSITY FOREST SCHOOL
NEW HAVEN, CONNECTICUT, U.S.A.

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

For further information address
JAMES W. TOUMEY, Director
New Haven - Connecticut

Hill's Seedlings and Transplants
ALSO Tree Seeds for Reforesting. Best for over half a century. Immense stock of leading hardy sorts at low prices. Write for price list and mention this magazine. Forest Planters' Guide Free.
The D. Hill Nursery Co., Evergreen Specialists
Largest Growers in America.
Box 503 Dundee, Ill., U.S.A.

PERFECTION SLEEPING BAG WITH PNEUMATIC MATTRESS

These evenly-soft air mattresses may be used on damp ground with perfect safety—they are non-absorbent. And they are absolutely sanitary with no place for dust or vermin to collect. Easily deflated and inflated—may be rolled into a small light bundle and easily carried in and out of the house. Last indefinitely. Invaluable for motor, yachting and camping trips. Endorsed by the Federal Government

Write for Catalog and endorsements to-day.

Pneumatic Mfg. Co. 537 17th Street, BROOKLYN, N. Y.



CONFEDERATION LIFE

ASSOCIATION UNCONDITIONAL ACCUMULATION POLICIES

Are liberal up-to-date contracts which guarantee to the insured every benefit consistent with safety.

Write for Particulars

which will gladly be furnished by any representative of the company or the

HEAD OFFICE, TORONTO



QUEEN'S UNIVERSITY

KINGSTON
ONTARIO

ARTS MEDICINE EDUCATION APPLIED SCIENCE

Mining, Chemical, Civil, Mechanical and
Electrical Engineering.

HOME STUDY

Arts Course by correspondence. Degree with
one year's attendance.

Summer School **Navigation School**
July and August. December to April.

GEO. Y. CHOWN,
Registrar.

MINIATURE CONSTRUCTION

Landscape, Mechanical and Architectural Models, Topographical Maps and Paintings. for

SCHOOLS — COLLEGES — MUSEUMS
Government work a specialty

MORGAN BROS. CO., Inc.
MODEL MAKERS

Room 1650 Grand Central Terminal
Phone 7720 Murray Hill

NEW YORK CITY

UNIVERSITY OF NEW BRUNSWICK

FREDERICTON, N.B.

DEPARTMENT OF FORESTRY
Established in 1908

Best of facilities for definite instruction and supervision in Practical Forestry.

Surveying, cruising and construction work carried on in our own tract of 3600 acres, with Forestry Camp in the centre.

Competent men from the School at present in demand to take up Forest Survey work with the Provincial Crown Land Department.

For further information address :

DEPARTMENT OF FORESTRY

University Calendar furnished on
application.

C. C. JONES, Chancellor.

R. O. SWEEZEY

B. Sc., M. Can. Soc. C.E.

CONSULTING ENGINEER.

Water Powers. Timber Lands.
Forest Industries.

164 St. James St. **MONTREAL.**

Heading Off the Fire Season

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

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

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

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

Canada's Profits From Her Forests

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

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

After the submarine warfare attain-

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

Must Guard Newspapers.

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

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

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

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

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

A Huge Industry.

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

In 1870 there were 760 men employed in the industry, with annual wages of \$197,815. By 1915 this had grown to 10,952 employees, and the wages to \$7,571,856. The value of the product was, in 1870, \$1,071,676, which had grown by 1915 to \$29,395,535, and had shown still greater increase in 1917. In July last, there were being manufactured in Canada 1,900

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

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

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

P. L. BUTTRICK

CONSULTING FORESTER

NEW HAVEN, CONN., U. S. A.

P. O. BOX 607

TIMBER ESTIMATES

UTILIZATION STUDIES

PLANTING PLANS

Landscape and General Forestry
Work.

Eight years experience in practical
forestry work of all sorts.

PHILIP T. COOLIDGE

FORESTER

Timber Estimating and Mapping.

Supervision of Lumber Contracts.

Surveying. - - Forest Planting.

STETSON BLDG., 31 CENTRAL ST.
BANGOR, MAINE.

The Game Birds of North America

Every reader with an interest in wild life should broaden his information on

“GAME BIRDS”

A splendid little book of 64 pages, 5 x 7 inches, made up of heavy coated paper throughout.

Forty-nine of the best illustrations in life-like natural colors you ever saw—really a beautiful piece of quadri-color printing. Decorated board covers.

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

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

FIFTY CENTS A COPY, POST FREE.

CANADIAN FORESTRY JOURNAL

206-207 Booth Building, Ottawa.

50CTS.

WAR TIME SPECIAL OFFER
ONE WHOLE YEAR
FOR FIFTY CENTS!

We are desirous of adding 1,000 new names to our list this month and to make it a certainty that we will not be disappointed we are offering

ROD AND GUN
IN CANADA

to you and 999 others for Twelve Months for 50 cents.

W. J. TAYLOR LIMITED, Publisher - Woodstock, Ont.

A Live Book on Our Wild Animals at a Bargain Price!



During the bright spring days there is opportunity for burnishing up your half-forgotten knowledge of our Canadian wild animals and for learning a hundred things you never suspected before.

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

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

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

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

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

Canadian Forestry Journal, Ottawa.

Please send copy of 'The Animal Guide' in leather binding to the following address. One dollar is enclosed.

Name.....

Address.....

BRITISH COLUMBIA'S MILLS.

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

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

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

Gagnon & Morissette

Lumber Contractors
Timberland Cruisers
Forest Industries

CHICOUTIMI, P.Q.

LT.-COL. L. J. D. MARQUIS

Forest Engineer and Mem. Can. Soc. of F.E;
Quebec Assoc. of F.E; Former Mem. Que. F. Service

Forest Cruising and Mapping
Timber Factors and Logging Costs
Facts on Forest Growth and Future Products

90 LOCKWELL AVENUE, - - QUEBEC

R. R. BRADLEY

Forest Engineer and Mem. Can. Soc. of F. E.
Consulting Forester to the New Brunswick Railway Co.

Timber and Pulpwood Estimates. Forest Maps. Advice on the Management of Wood Lands. Timber lands listed for sale.

GLOBE ATLANTIC BUILDING, ST. JOHN, N.B.

A Tree Made Famous by the War

BY POLLOUGH POGUE

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

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

A Forest Parvenu.

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

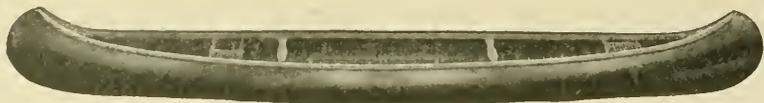
the white spruce stood higher in popular favor. Designers and constructors of aeroplanes, however, recognized the special qualities of silver spruce which make it desirable for airplane building. Full grown trees average 150 feet in height and four feet in diameter. Some trees grown to a height of 200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

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

Cost of Airplane Spruce

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

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

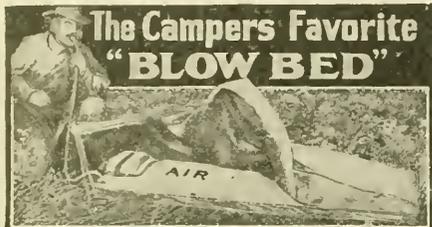


PETERBOROUGH CANOES

For service our Canvas Covered Canoes are unequalled. We make a complete line of Canoes, Skiffs and Motor Craft. Our catalogue will be of interest to you.



Peterborough Canoe Co., Ltd., Peterborough, Canada



(Successors to Metropolitan Air Goods Co.)

SLEEP ON AIR with a COMFORT SLEEPING POCKET

Recommended by the Forest Service, Campers, Physicians, Invalids, Tuberculosis Patients and Sportsmen everywhere. A warm, dry, comfortable bed. Wind, rain, cold and water-proof. Packs 6 x 25. Air goods for home, camp, yacht, canoe, etc. Illustrated Circular Free by mentioning Canadian Forestry Journal.

ATHOL MANUFACTURING CO.,
ATHOL, MASS., U.S.A.

Dealers write

FOREST TELEPHONES



Make the life of the forester better worth living. They relieve him from the appalling loneliness. They help him to keep in human voice touch with foresters miles away.

In emergencies—fire—sickness—hunger—the speed with which they can summon help is marvellous.

Write for full particulars of how to install the Northern Electric Forest Telephone System. Address the Office nearest you.

Northern Electric Company
LIMITED

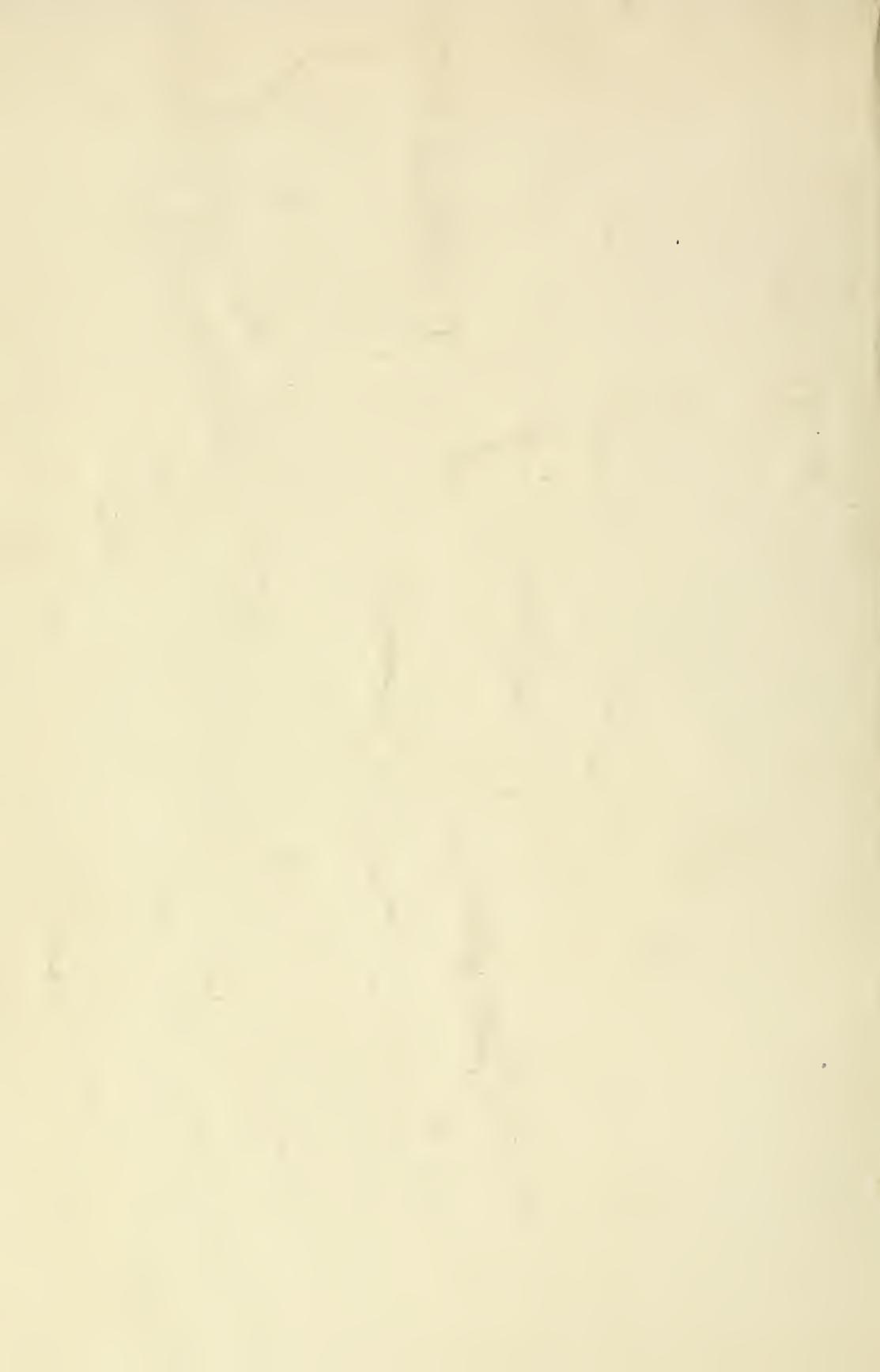
Montreal
Halifax
Ottawa

Toronto
London
Winnipeg

Regina

Calgary
Vancouver

Northern · Electric · Forest · Telephones ·



Canadian Forestry Journal

Vol. XIV.

APRIL, 1918

No. 4



FAULTY OF FORESTRY

MAY 1918

UNIVERSITY OF TORONTO

Galbaduk
TRADE MARK

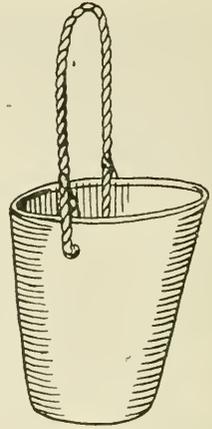
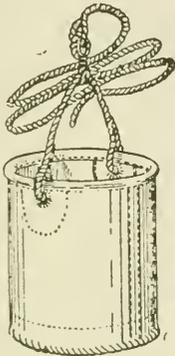
Salvage Covers

and

Water Pails

Fill Your Every
Requirement

SEND FOR SAMPLES



Woods Manufacturing Co., Ltd.

—Successors To SMART-WOODS, LTD., Ottawa, Canada.—

THE UNIVERSITY OF TORONTO

AND

UNIVERSITY COLLEGE

WITH WHICH ARE FEDERATED

VICTORIA, TRINITY, ST. MICHAEL'S
KNOX and WYCLIFFE
COLLEGES

FACULTIES OF

ARTS

APPLIED SCIENCE

MEDICINE

EDUCATION

HOUSEHOLD SCIENCE

FORESTRY

For further information, apply to the Registrar of the University,
or to the Secretaries of the respective Faculties.

Canadian Forestry Journal

CIRCULATION 6500 COPIES MONTHLY

Vol. XIV.

WOODSTOCK ONT., APRIL, 1918

No. 4

CONTENTS FOR APRIL

“The Seignory of Lotbiniere”

By L. Garneau, F. E.

“Helping the Robins to Nest”

By Winthrop Packard

“New Silver from Old Stumps”

By James Lawler

“Norway’s Profits from Forests”

“Logging by Elephants in Burma”

“The Practical Application of Scientific Forestry”

By R. O. Sweezy, B. Sc.

“New Brunswick Launches its Forest Service”

“The Forests of Alberta and the Public Welfare”

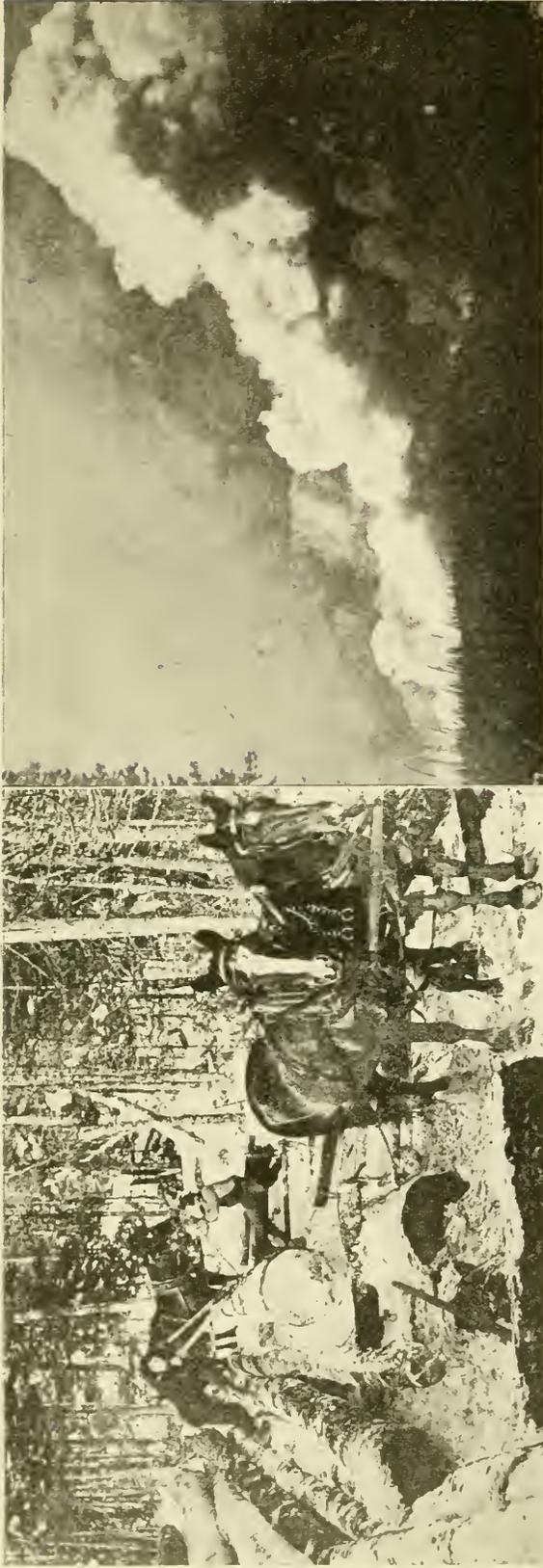
The Canadian Forestry Journal will be sent to any address for one dollar a year, subscription including all other publications of the Canadian Forestry Association.

Address all Communications to

THE CANADIAN FORESTRY JOURNAL
206-207 BOOTH BUILDING, OTTAWA

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

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



WHICH PICTURE FOR 1918?

Will it be a productive forest in your locality, Mr. Reader, or a forest given over to charred stumps and windfalls?

Will it be employment for skilled workers or will you send these workers to some other district?

Will it be an abundant near-at-hand supply of your wood essentials, without which you cannot exist, or will you pay extra for importing them?

Will it be a Forest Protection year worthy of Canada's other records in war participation or will it pile up a debit of five or six million dollars as a millstone on the overburdened future?

The Seignory of Lotbiniere

BY L. GARNEAU, F.E.

Forest District Inspector Forest Service, Quebec.

A Forest Worked in Foresight, Where Science in Wood Harvesting Gets Elbow Room.

This track of timber land is situated on the south side of the St. Lawrence, 35 miles above Quebec, in the County of Lotbiniere. At the present time, the forest comprises about 44,000 acres, but in twenty years from this date (1914) an additional 40,000 acres will revert to the present administration. These acres are now held by an American Lumber Co., which have the cutting right for that period.

This forest has been in the possession of the present owner's family since 1672, Louis the 14th having granted it in several parcels in the form of seigniories to the Sieur de Lotbiniere.

It was not until 1833 that any definite exploitation was undertaken, except for the King Oak. The first cutting contract was made out by a notary, and the jobbers, for the most part tenants on the estate, undertook to cut and roll into the river 100 to 3500 logs made from the best pine (*Pinus strobus*) in which the estate was well stocked. No log that was not absolutely free from defect was ever utilized, and even at the present time, valuable pine cut 50 or more years ago and discarded as being unmerchantable, are picked up and made into serviceable material. The jobbers were paid \$12.00 per 100 logs and were obliged to roll them into the river when the spring came, at their own expense.

The timbered area is practically level with a slight incline from the St. Lawrence to the southern boundary of the estate.

The tract is well drained by the river du Chene and its tributaries, the Cedre, Ormes, Huron, and Bras d'Edmond rivers.

The soil is a rich loamy sand without croppings of gravel along

the rivers banks. The climate is severe at times, so that many of the trees suffer from frost cracks.

The population consists of farmers, who manage their farms in the summer and usually seek employment for the winter in the woods; they are skilled woodsmen, few of them understand the financial side of the exploitation and therefore do not make as large profit as they should. Unfortunately the tendency at present is to emigrate to the cities and towns, and labour, as a result, is getting scarce.

The personnel consists of the following: an administrator, mill manager, assistant, forest-engineer, two assistants, superintendent of fires, two assistants.

The inventory done shows that merchantable material per acre amounts to 17,515 feet, so the total merchantable timber amounts to 766,-720,000 feet.

A Trust Fund

The object of management is to insure a periodic sustained yield with adequate financial return on the investment; in other words, to handle the forest as a trust fund in such a way that the present may have the largest yields and benefits from the forest for future generations.

The exploitation and transportation of the material to the mill at Leclercville is and always has been a simple matter. It has been remarked before that the drainage is excellent, the tributaries of the main river gridironing the tract in all directions, the hauling roads to the rollaways are therefore short, as a result the cost per 1000 feet being \$4.00. The driving is also inexpensive, the cost per 1000 feet ranging from 0.25 to 55 cents, according to the amount of

snow and ice in the forest during the driving season.

Danger from Fires

The fire danger has always been a menace to the estate but up to the present time, no serious damage has been caused. Surrounded as we are by settlers and having a railway passing through the heart of the forest the danger is, indeed great, specially during the month of May and the first week of June, before the young green vegetation has covered the forest floor, the greatest precautions must be taken to put out any incipient fires.

Half the cost of patrolling the railways right of way is borne by the American Co., our superintendent having authority to call on any of their men in case of a serious conflagration. The right of way is patrolled after the departure of a train from Laurier or Villeroy Stations to either end of the estate. The fire ranger travels on a track velocipede and is equipped with a canvas bucket and a Quebec combination axe, mattock and shovel. As many as 19 incipient fires have been put out in a day. A monthly fire report is kept, which states the number of fires, their location, amount of damage and their origin. Wells have also been dug at every mile along the right of way and telephone lines installed through the forest. A special gasoline motor is used to bring up a fire fighting crew, when occasion demands it. The cost of the fire service is not more than one cent and a fraction per acre.

Tamarac Recuperating

The forest has suffered from the Tamarac saw fly as did all the other timbered regions in the province; as a result nearly all the merchantable Tamarac is dead. There is, however, a vigorous young growth coming up. This tract of timber did not suffer to any noticeable extent from the spruce bud worm; the reason perhaps being that the prevailing winds, from their seat of origin, did not pass over the forest.

It has been decided that the selection system by divisions can best fulfil the object of management on this estate.

In former years, the jobbers choose their own "Chantiers" or cutting areas; as was natural, they were confined to the river banks, and the maturing timber beyond a certain distance from the rivers was rarely, if ever, touched by the lumber jack.

The new regulations distribute the cutting areas over the whole track, a portion, called a division, being cut over a certain period, usually one or two years. The size of the division varies according to the amount of timber it contains. Natural boundaries, such as rivers and swamps, are chosen as much as possible. The division is divided into compartment a mile square, or containing 640 acres. These compartments are required for scientific calculation and orientation. The compartments are divided when necessary into working blocks (chantiers) which are under the control of a jobber.

Roman numerals are used to designate the divisions, the compartments have figures and the working blocks letters.

The trees to be felled are marked by the forester and his crew before the jobbers begin their work. The regulations contained in the contract with the jobber serve as a guide to the marking crew. No hard and fast rule is followed in the marking, as many trees below the diameter limit will have to be felled. These are trees which are liable to be broken or damaged by falling trees which have been cut in the neighborhood; trees which left would be subject to wind throw; infected trees, suppressed trees and damaged trees. On the other hand some trees will have to be left standing which have the required diameter but must remain as wind breaks and seed trees.

The Cutting Plan

A jobber, before undertaking a contract specifies to the administrator

or his agent the number of logs he wishes to make; the forester is then consulted and from his plans and estimates the compartment or working block containing the required number of logs, is marked for him. As soon as the required number of board feet for the year have been secured, the contracts are closed.

Waste Elimination

Our policy is to utilize all merchantable material, in accordance with the cutting plan. Hemlock especially is to be favoured, as its rapid rise in price, especially of the inferior qualities and the large percentage it forms of the standing timber warrants its exploitation in larger quantities than has been the custom. From the following data, it will be seen that our cut of hemlock is not in proportion to the standing timber:

Average amount of Hemlock per acre.....	10. 000 feet.
Average amount of Spruce and Balsam.....	6. 000 "
Percentage of Hemlock cut 20 per cent " of Spruce and Balsam.....	70 per cent

From the cutting plan, it will be seen that the proportion should be 5 parts Hemlock to 3 parts of Spruce, or 5 million feet Hemlock to 3 million of Spruce and Balsam. It will be some time before these figures can be practically applied, and therefore the best policy would be to increase the cut gradually and when economic conditions are favourable, cut the specified amount.

Every effort must be made to eliminate waste, especially in tops and butts, and the main object to be aimed at while cutting is to leave a clean, healthy growth of young trees, with the age classes properly represented. By these means, the great principal of Forestry will be approached, namely the reproduction of timber in a systematic manner.

L. Garneau, F. E.
Forest district Inspector
Forest Service, Quebec

**NEW PUNISHMENT
FOR BIRD KILLERS**

The old form of punishment by the stocks and the pillory had at least the advantage of advertising both the crime and the penalty. *Youth's Companion* says a similar object seems to have been in the mind of a California judge who recently fined two boys for shooting song birds. The fine was twenty-five dollars apiece, but the court remitted it on condition that the boys carry a banner furnished by the Game Protective Association, with a suitable inscription and the bodies of the dead birds, properly labeled and classified in respect to their usefulness as destroyers of insects; that they distribute one hundred pine cones and six rule cards; and that they bring in fifty signed pledges from other boys.

The Community End

BY LIONEL HITCHENS

"No man can serve two masters; he cannot serve himself and the community; for then the kingdom would be divided against itself; he can only serve himself by serving the community, and this is surely the only sound foundation on which industry can rest. If we are ever to solve the great industrial problem, it can only be by recognizing that industry is primarily a national service, and that the object of those engaged in it is first and foremost for the good of the community as a whole."

The Minnesota state forestry department is placed in charge of scaling and measuring timber cut from state lands, under order of the Minnesota Public Safety commission, adopted in January.

Helping The Robins to Nest

BY WINTHROP PACKARD



Courtesy "Our Dumb Animals."

In a *Bird-Lore* census, taken not long ago, it was estimated that the robin was the most numerous American bird, the house sparrow coming next. The robin, in one form or another, nests practically all over the continent of North America and the bird is one of the most friendly that we have. The poet Wordsworth once referred to the English robin as

"Honest Robin, who loves mankind both alive and dead," and the words might apply equally to the American robin, for the bird loves to nest not only in our gardens but in our cemeteries and upon our very houses.

Often a robin will select a corner of the porch, a nook under the eaves, or even go inside of the building itself. Recently one is reported to have flown in at the open window of a church during service and to have begun to build his nest on a cornice just over the pulpit. The window was left partly open from that time on and the family of young robins was successfully reared in this admirable sanctuary.

The nesting robins may be assisted by providing nesting sites; a shelf up under the eaves will often tempt them or a sheltered platform set on the limb of a tree. If there

is a trellis in the garden on which a rambler rose-bush or honeysuckle climbs, one of these sheltered shelves set at the top of it forms an admirable site for a robin's nest. One can assist also by putting out nesting material. In the case of the robin the first requisite is mud—good, plain, old-fashioned, black sticky mud, for the robin makes the foundation of his nest invariably of this. In sandy countries and dry weather the birds often have considerable difficulty in getting mud for their foundation. In one of her books Olive Thorne Miller tells of a robin that wet his feathers, then rolled in the dust and went to the nesting site, where he picked the resultant mud from his plumage and used it for the foundation of his nest.

Most of us nowadays have a bird bath in the yard and it is an easy thing to put a dish of clay or loamy soil beside this and moisten it to the right consistency. The robin will come and take it by the mouthful—poor chap, he has no other means of getting it—and begin the nest, perhaps on the porch but more likely on the near-by shade tree. Usually the mud is built up like a shallow cup and then soft grasses—dried grasses of the previous year's growth—are embedded in it and skilfully built around until the completed structure is mud below but softly lined and built up with these grasses. From that time until the eggs are hatched the less human oversight and interference the better, although the brooding mother bird will be very fearless as the process of incubation continues, but after the young are hatched out a gentle friendliness wisely offered will be well received and appreciated.

The task of feeding a nestful of young robins is a great one. Everyone of them will eat at least its own weight in insect food daily. Earthworms, rolled in grit, are well liked by the youngsters. Cutworms, inchworms, mealworms—almost any soft-bodied, non-hairy caterpillars may be given freely. Nor need one have any fear that the family

will be pauperized by any such charity. This feeding will help the youngsters to grow up with very friendly feelings toward the human family and in no other way can you so readily gain the confidence of the parent birds.

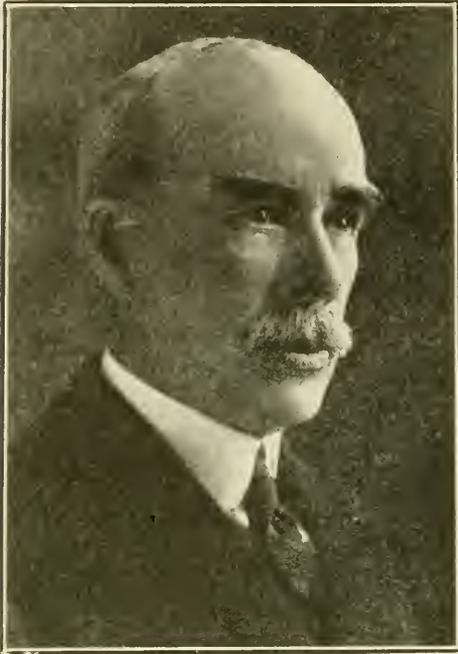
Oftentimes, disaster overtakes a robin family; for some reason the parent birds do not return to the nest and then the human neighbors must take charge of the young. If worms of various sorts are not readily available, bread and milk will nourish the robin children very well. They grow up rapidly and presently will learn to fly, but although they by and by get their own food themselves they still will be very friendly with those who have fed them. They should be allowed complete freedom and will, of course at the migration time, fly away south with their fellows.

If your young robins survive the winter they will surely return to your yard and the delightful process of nest-building may be watched all over again.

Robins, probably the same family certainly their descendants if not the same birds, have nested year after year in the same site for twenty years.

A U.S. patent granted Edward F. Millard, describes a process for making an all-groundwood newsprint paper in which about 50 per cent. of a short thin fibrous pulp is mixed with 50 per cent. of a long fibered pulp. The short-fibered pulp can be produced by using a machine such as Millard describes in his patent, and the long fibered pulp can be made with the same machine. It is claimed that the long fibres facilitate the running of the pulp while the short fibres give strength and finish to the sheet.

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



OUR PRESIDENT

Colonel J. S. Dennis, Chief Commissioner of Colonization and Development of the Canadian Pacific Railway; President of the Canadian Forestry Association, 1918.



HON. SMEATON WHITE

President, Gazette Printing Company, Montreal; elected a Director of the Canadian Forestry Association at the last annual meeting.

Norway's Profits from Forests

Twenty-one per cent of the Kingdom of Norway is covered with forest—that is, about 17 million acres. Of that, about 15 million acres is productive forest. The Government owns about two million acres. The commercial forests under Government supervision comprise about one million acres. The rest, or about 12 million acres of productive forest, is private property. Seventy-five per cent of the timber is spruce (*Picea excelsa*), and pine (*Pinus silvestris*) in about equal quantities, as well as some oak, ash, elm and basswood. Birch is found everywhere. The annual forest growth or increment per acre is about 21 cubic feet. Nearly all the cut timber is hauled on sleighs to the rivers in the winter, and floated to the coast in the spring. The felling is now nearly all done

by piecework, which has proved to be a great success.

The value of forest products exported is about \$30,000,000 annually. Until recently the export consisted chiefly of logs and staves, but pulp, planks, boards, doors and windows, etc., have now come into prominence. The pulp represents about 50 per cent of the export value.

The people have awakened to the importance of improved and conservative methods, and planting in the coast districts has also been encouraged. Most of it is done by school children. Douglas fir, imported as seed from the Pacific Coast and raised in nurseries, is being planted quite extensively in some parts of Norway. Forestry is taught in all public schools and instructors give lectures in the country districts.

New Silver From Old Stumps

BY JAMES LAWLER

How Canadian Investigators in Forest Products Gave a New Lease of Life to Cobalt.

Most people are familiar with the saying of a great English Chemist that he owed his success to his practice of examining the waste materials left after his experiments were over. But this work of supererogation on the part of the old-time chemist has become the regular business of the chemist, the physicist, and the experimenter of today. Everywhere these men are being asked to make bricks without straw—and it is a poor day when they do not return to their taskmasters a better brick than was made under the old conditions. Why does the paper on which this article is printed cost so much more than the common news-print paper? Because half of the material in the tree from which the pulp was made by the chemical process went out into the Ottawa river, or the St. Lawrence river, or the Welland canal in the “waste liquor.” Why does not somebody get busy in the work of recovering some of this wood material? Somebody is busy. The Forest Products Laboratories of Canada, under the Forestry Branch of the Department of the Interior have a staff of men at work on this very problem, and as they make an advance toward its solution the results will be made public for the benefit of the people of Canada. This is one of the ways in which the Dominion Government is trying to link up science and industry for the good of the nation.

Pine Oil Flotation

That, however, is another story. What this article endeavors to show is how the waste wood material which is usually left to rot, or which is thrown away or destroyed in the process of manufacture is being

used to aid the mining industry. There seems no connection between stumps and mining, but when some unconquerable chemist found that the best means of extracting many of the ores was the “pine oil flotation” process, the stumps and waste wood began to have a new value in the eyes of mining men.

Pine oil is a product secured through the re-distillation of turpentine which, in its turn, is produced commercially chiefly from the “hard” pines of the southern United States. Pine oil forms a very small proportion of the oils produced from the pine tree. It would be costly under any conditions, but when the discovery was made that, in some cases, 20 per cent. more metal could be extracted from the ores by the oil flotation process than by any other method the price of pine oil went up to ten or fifteen times its original price, and, as the United States reduction companies contracted for practically all that was being made in the United States, Canadian miners had either to give up the process or get pine oil somewhere else.

Oils in Pines

Northern pines, generally speaking, are not high in their turpentine content. In the Southern States turpentine is gathered from the living tree much as we gather maple sap, but this method cannot be used on Canadian trees. The only other way is to get the turpentine out of the wood by a process of distillation, and, as this turns the wood to charcoal, it is clear that the chemist must look for his turpentine, not in the log piles of the lumberman, but in the stumps and waste wood left after the body

of the tree has been taken for other and more profitable uses.

Here, then, was the situation: the miners of Canada knew that they could get, say, 20 per cent. more metal out of their ores by the oil flotation process, but they could not get United States pine oil in practicable quantities; how were they going to get that oil?

Some of the mining companies did experiment and got some valuable results, but, after all, as some of them pointed out, the business of a miner is mining and not experimenting, and an appeal was made to the Minister of the Interior to have the Forestry Products Laboratories of the Forestry Branch take up the investigation. This request was granted, and the Forestry Branch secured a Canadian chemist who had some experience in wood distillation and set him to work on the project.

Eight Months Investigation

People wonder at the hundreds of experiments an investigator like Mr. Edison makes in investigating a big problem, but that is the way of the modern laboratory, and the hunt for a Canadian pine oil was no exception. In the eight months the special investigator was at work, he searched through the available literature in technical libraries, traveled through the northern Ontario mining region, visited the mines where the oil flotation process was in operation, and conducted "runs" in the experimental plants set up by the mining experimenters. Another line of study was that of the hardwood distillation plants in Canada. These plants do not use pine or other resinous wood and do not attempt to make pine oil, but the processes are analogous and the result of this study was, as will be seen, advantageous both to mining and to the hardwood distillation industry. And in the meantime and in between and all the time scores of tests and experiments were going on to try all kinds of pine and other wood oils to discover those having the right

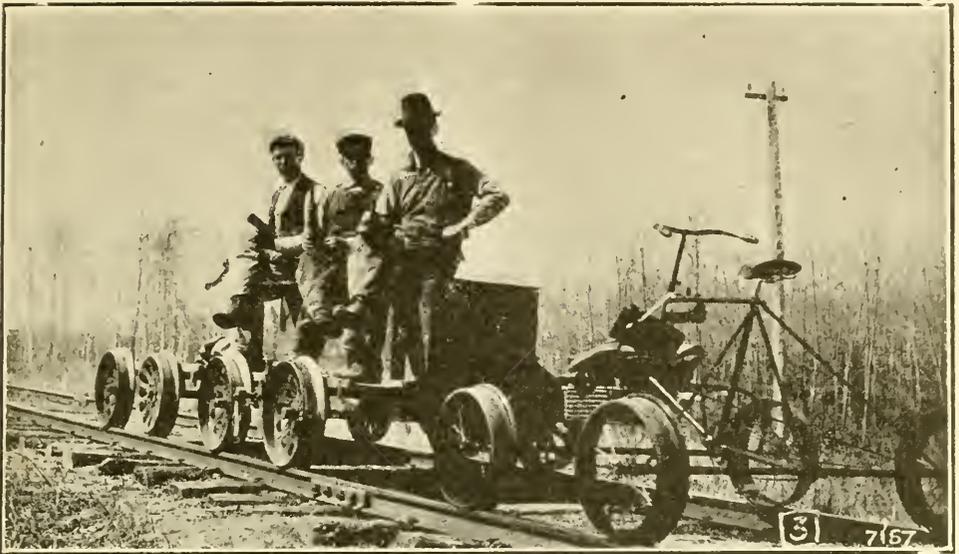
"collecting" and "frothing" properties.

Some of the facts brought out in this investigation were highly illuminative. For instance, it was found that in the United States between fifty and sixty companies had started into the distillation of resinous wood and of these only about half a dozen remain, the rest having made sad failures of the attempt. This is where governments can very effectually help industry by doing the experimenting and allowing private concerns to turn out the product on the lines discovered to be most successful.

But, harking back to pine oil, the investigator found that the old red pine stumps standing thick on "pine plains" in eastern Canada, like those on which Camp Borden is located near Barrie, Ontario, would produce the oil; so would the stumps of the yellow pine trees of British Columbia.

The Testing Stage

He extracted the oil and then the question was whether it would work as well as the oil from the Southern States. Not being a mineralogist, he could not handle that part, but here another department of the Government—the Department of Mines—came into the arena, and as fast as the Forest Products Laboratories made, mixed and combined the oils they were tested in the ore-dressing station at Ottawa on the ores produced in Cobalt mining camps. These combined experiments showed that as good an oil as that from the Southern States could be produced in Canada, but they showed that in any event it would be a very expensive article, because it was present in such small quantities in the trees and because it left in its manufacture a whole train of by-products for which there is no market in Canada. Whether the manufacture of pine oil is a profitable industry for Canada is very doubtful, but the discovery that pine oil will always be expensive was discounted by another one, which is that certain creosote oils, at present



A "track automobile" of the Dominion Forestry Branch in Alberta, showing the motor-driven speeder and the velocipede.

a by-product in the hardwood distillation industry and burned under the boiler as a waste product, can be used in the oil flotation process on equal terms with the expensive pine oil. At present the hardwood distillation industry in Canada uses about five hundred cords of wood per day, and as two and two-fifths gallons of creosote oil are extracted from each cord, it means that Canada has been producing and throwing away as waste about 1,200 gallons per day of the very material required to operate the oil flotation process.

Success in Practice

What the mining men think of the successful termination of this search is shown by a statement made by one who most actively interested himself in this effort to find a new oil, Mr. Arthur A. Cole, Mining Engineer of the Timiskaming and Northern Ontario Railway and President of the Mining Institute. Mr. Cole says of the new reducing agent:—

"A run was made for a whole week, pine oil being entirely cut out and its place taken by hardwood creosote oil. The results obtained in this mill test corresponded with

the laboratory results, proving conclusively that hardwood creosote oil can be made an absolute substitute for pine oil in the treatment of Cobalt ores. The only work now remaining to be accomplished before the full benefit of the results of this investigation is realized, is for the hardwood distilling companies to establish a uniform method of handling this hardwood creosote oil so that they can turn out a uniform product. We will then have the highly satisfactory result from this investigation, of a waste product from an already established Canadian industry taking the place of a high-priced American product. At the present time there is sufficient of this hardwood creosote oil being produced not only to look after the present Canadian situation but also to allow for considerable expansion for export."

Canada is at war and needs every available ounce of silver to make silver bullets to help in the winning. She has the resources and the brains, and by such combinations of science and industry as outlined above, there will result the largest possible, most efficient and most economical development of our natural resources.

Logging by Elephants in Burma

Forest Conservator Visits Canada to Investigate Modern Woods Methods.

The high cost of elephants has so influenced the timber trade of Burma that Mr. F. C. Leete, Conservator of Forests, has been visiting Canada in an endeavor to secure mechanical tractors. He visited the Booth limits at Madawaska, the River Ouelle Pulp and Lumber Company's limits at St. Pacomé, Quebec, and other localities where log hauling machinery is successfully employed.

Burma contains the finest timber in the Indian Empire. The great commercial species is teak, a wood of remarkable strength and durability, withstanding insect and fungous diseases and retaining its quality even after long years of alternate exposure to extreme heat and immersion in water.

Driving in Torrential Rains

As the annual precipitation in Burma occurs within a few weeks—during which the white officials usually retire to Rangoon—the annual driving of logs must be done in the most immoderate weather. Much as in Canada, dams are constructed and waters stored so as to float the logs down the small streams to the Irrawady, the great trunk river of Burma. Native workers are almost exclusively employed in this task. Rafting on the Irrawady is not dissimilar to the Canadian process, except that the rafts are smaller, and the booming is under the control of British forestry officers.

In the cutting of the forests, the Forest Service officers mark the mature trees to be taken out. They are then girdled so as to facilitate barking. At one time, before British occupation of the country, one timber company controlled the cutting rights over the whole extent of Burma, but this has been much modified and cutting rights can now be secured by any operator. Jobbers supply a large

percentage of the annual teak cut, and are obliged to operate under strict regulations. Only the imposition of diameter and other requirements has preserved the valuable woods from complete destruction. Under the unregulated methods of former times, waste of teak was enormous. For example, the native dishes were usually composed of teak, which were made by sawing out a small section of a large teak log and leaving the remainder where it fell. This has been stopped not alone by the British forestry laws but by the success of German commercial agents in inducing the people to use cheap metal plates and cooking utensils. As to German influence in Burma during the war, the native population is content to believe that no power on earth can disturb the "British Rajah"—and let it go at that.

British Justice With Natives

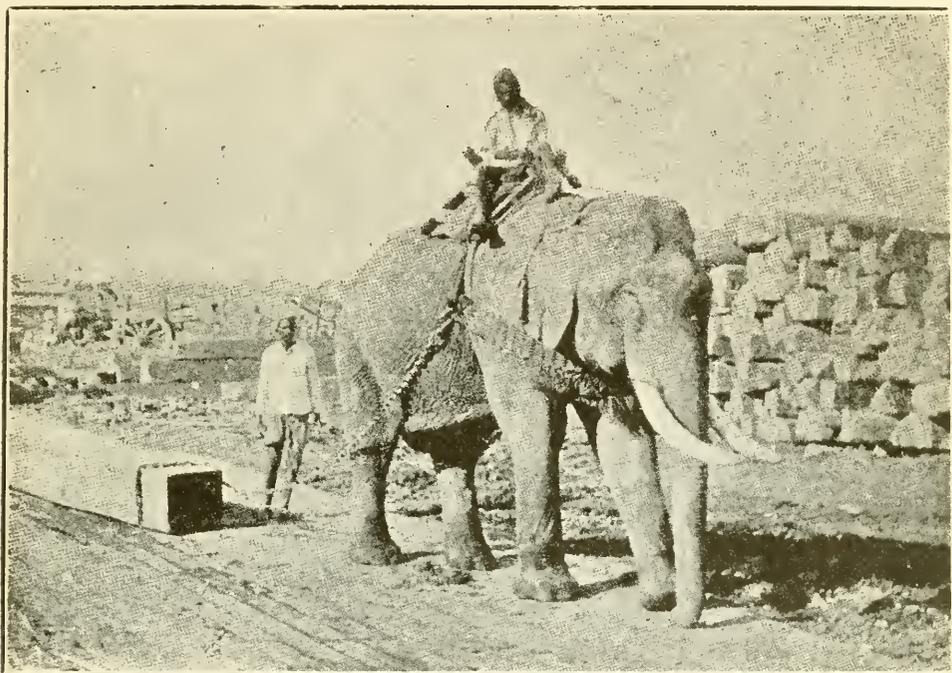
In its dealings with the native population, many instances have occurred wherein the British sense of rigid justice in dealings with native peoples is illustrated. For example, the Forest Service sometimes decides to take into the reserves a piece of land adjacent to a village. Six months in advance, advertisements are conspicuously posted in the village inviting all persons claiming any rights whatsoever in the land to be reserved to appear before the Commissioner at a given date. As often as not, the entire area is blanketed with claims two or three times over. Each claim is carefully examined and, if bona fide, is generously dealt with. In many instances the Commissioner decides cases against the Forest Officer and in favor of the native claimant and may indeed order the whole proposition abandoned if the number and character of the claims promise an abnormal

amount of trouble.

Elephants and native oxen have been the great beasts of burden. The advancing costs of elephants which now range from \$2,000 to \$3,000, has made the introduction

of modern hauling machinery desirable.

This involves the construction of roads, (which were dispensed with in the use of elephants) and consequently a heavy state investment.



HAULING LOGS IN A BURMESE TEAK YARD.

WOMEN AS RANGERS

"I wonder," asks a correspondent in the Toronto newspapers, "how the Ontario Government will get men to do the work of fire rangers? The government has to patrol miles of railroad besides the forests. Of course, women could not do the forest work, for the men have to carry all their provisions and their canoes over the portages and to cut portages and find new routes and rough it generally. Perhaps women could do the railroad patrol work, and thus leave hundreds of males free for the other and rougher and heavier work. Patrolling the

railroads is healthy, and it would be a change. What do the women think about it?"

DECLINE IN PUBLISHING

For twenty years the number of newspapers and periodicals in the United States has been steadily declining, relatively to population. In the last decade or so the number of daily newspapers has notably decreased. A contemporary reports that, though the population of the fourteen largest cities in Michigan had doubled, the number of daily papers has fallen from forty-two to twenty-three.

The Fuel Value of Wood

BY W. B. CAMPBELL

Forest Products Laboratories of Canada, March 12, 1918.

An Authoritative Guide for the Wood User, Giving Accurate Data on Fuel Values.

Owing to the scarcity of coal in the winter just passed 1917-18; many people are becoming more interested than heretofore in the use of wood as fuel. It is the purpose of this short article to discuss the value of different woods in this connection.

The primary quality of a fuel is to give off heat when burned. Secondary qualities are ease of handling, ease of kindling, amount of ash, etc. From a chemical point of view, the burning of a substance in air simply means the combining of that substance with the oxygen of the air. This reaction liberates heat in a greater or lesser amount depending on the substance burned. The amount of this heat is measurable and the unit used for practical purposes in this country is what is known as the British Thermal Unit or more familiarly as the B. T. U. One B. T. U. represents the amount of heat necessary to raise the temperature of one pound of water through 1 degree Fahrenheit.

For every combustible substance there is a corresponding "Heat of Combustion" which is invariable for that substance and is expressed as the number of heat units or B. T. U.'s. given off by the combustion of 1 pound. This quantity is the same no matter how slowly or how rapidly the combustion takes place and it has no direct reference to the temperature of the fire. If combustion is rapid a large number of heat units are produced in a short time and consequently the temperature is high. If combustion is slow the number of heat units per second is small and the heat gets a chance to become dissipated, consequently the temperature is low

When Wood is Wet

If a fuel is wet the water must all be evaporated during the burning of the fuel and this takes away some of the heat. To heat up a pound of water from the ordinary temperature to the boiling point, evaporate it and heat the steam to the temperature of the chimney gases requires about 1220 B. T. U. Consequently for every pound of water in the fuel, this amount of heat goes up the chimney. This loss is present to a greater or lesser extent with all fuels but is particularly important with wood. Coal may contain 2 or 3 per cent. water or 40 to 60 pounds per ton. Green wood may contain 1,500 to 2,000 pounds of water per cord. Air dried hardwood holds about 720 pounds per cord. The reason for demanding well dried wood is therefore quite obvious.

Why Woods Differ

The next statements may not seem quite so evident but they are equally true. The "Heat of Combustion" or "Calorific value" is, within narrow limits, the same for all woods. That is, a pound of one wood will give off almost exactly the same amount of heat as a pound of a different wood. This does not mean that a cord of one wood will give the same heat as a cord of any other wood because one cord may be much heavier than the other. Some woods are highly resinous—red pine, for instance—and these have a slightly higher heating value on this account but the difference is not great. The reason for all woods having equal Calorific Values is not far to seek. Fundamentally, all woods

consist of the same substance and one species differs from another chiefly by the way this is arranged in the wood structure. Since all woods do consist chiefly of the one substance, the Calorific Values of all of them must be the same. Measurements of the Calorific Value show that 1 pound of perfectly dry wood yields 8,220 B.T.U. For comparison it may be stated that 1 pound of good hard coal yields about 12,000 to 13,000 B.T.U. and poor coals go very much lower. Perhaps it would be better to compare these in terms of cords and tons. One cord of air dried maple or birch will contain about 3,250 lbs. of dry wood and about 720 lbs. of moisture. Its heating value will then be

3,250 x 8,220—26,715,000 B.T.U.
less 1,220 x 720— 878,400 B.T.U.
giving a net heating value of 25,836,600 B.T.U.

A ton of coal gives a net heating value of

2,000 x 13,000—26,000,000 B.T.U.
These two values are very nearly equal so that we can say that *one cord of well dried hardwood (beech, birch or maple) is equal to one ton of good hard coal.* Other woods have heating values in proportion to their weight per cubic foot.

A Guide to Values

The following table shows the number of cords of various common woods required to equal 1 cord of well dried hardwood or 1 ton of coal.

Ash	1. 10	cords.
Basswood	1. 70	"
Beech	1. 00	"
Birch	1. 00	"
Butternut	1. 60	"
Elm	1. 00	"
Maple	1. 00	"
Oak, red	0. 97	"
Oak, white	0. 93	"
Poplar	1. 55	"
Cedar	2. 10	"
Douglas fir	1. 20	"

Balsam fir	1. 80	cords.
Hemlock	1. 60	"
Jack pine	1. 50	"
Spruce	1. 60	"
Tamarack	1. 15	"

Split Wood is Best

This table gives approximately the heating value of well air dried cordwood but the amount of drying is important. Wood piled with the bark on dries very slowly so that when purchasing wood split wood is to be preferred to small sized round wood since the latter will probably not be so dry and will include more bark and rotten wood which has little heating value.

Some other consideration may at times be as important as the actual heating value of the wood. For instance, the ease of lighting is to be considered if the wood is wanted only for kindling or for a quick fire in the kitchen range in the summer. Cedar and pine are especially good for this purpose. For an open fireplace the hardwoods are best. Spruce makes a very "crackly" fire which is sometimes an attraction but there is always some danger that a spark may be thrown out of the fire to the detriment of clothing or the rug.

A Comparison of Ashes

Another point worth bearing in mind in connection with the use of wood in place of coal is the difference in the amount of ash produced. A cord of wood makes only about 100 lbs. of ashes while a ton of coal makes from 200 to 300 lbs. Judging from the amount of ash coming from a ton of coal past winter it is not surprising to find lots of ash in the fireplace. It is especially true in the case of the Tamarack.



1. An example of colored lantern slide cartoons prepared and circulated by the Canadian Forestry Association at its own expense in scores of motion picture theatres in timbered districts. Special designs and wording are being used in French-speaking Sections of Quebec.

Arch Trees Change Their Habits

Coniferous trees retain their habit of the winter. So the habit that the arch trees up are often common part of the forest, a number of conspicuous arch trees which are lar- arch trees.

Whether they have always been deciduous, or whether they have gradually adopted the deciduous habit is therefore, an interesting question. Some light is thrown upon the subject, however, by the behaviour of young larch seedlings. It is well known that plants in the immature condition often run through more or less rapidly former conditions of existence. Thus the young cactus plant may produce leaves and only later take

"NO MAN'S LAND" IN CANADA



Decide for Yourself

**THE MAN WHO STARTS A FOREST FIRE
THIS YEAR IS DOING THE KAISER'S WORK!
PUT OUT YOUR CAMP FIRES- PUT THEM
DEAD OUT!
CANADA NEEDS HER FORESTS AS NEVER BEFORE**

CANADIAN FORESTRY ASSOCIATION

2. Another example of Canadian Forestry Association cartoons exhibited between reels in picture theatres.

on the usual cactus form. Larch seedlings appear to be no exception to this rule. For some years after the seeds have sprouted, the plants retain their leaves through the winter, but when older, they throw them off. It seems, therefore, that the larches were once like the other evergreen cone-bearers, and have since adopted the deciduous habit. A similar condition exists today among genera, represented in both the tropics and temperate zones. In the tropical rain forest, the species are deciduous. Tropical oaks are evergreen and those of northern regions are deciduous, but even in

the latter regions seedling oaks often retain their leaves through the winter. The deciduous habit is very apparently an adaptation to avoid the drying effects of the cold. Only in the dried parts of the tropics do the broad-leaved trees drop their leaves and then it is for the same reason—to avoid injury through drouth.—*The American Botanist.*

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

An Ounce of Prevention or a Ton of Cure?

One forest fire last year swept 14,000 acres.

Prevention of that fire would have cost: One man's Vigilance.

To replant that area would now cost \$140,000.

To replant that area would take 14,000,000 trees.

"Almost everyone who discusses the forest situation in Canada asks: What are you doing in reforestation? Yet the same man will go out in the forest and drop a match or a cigarette stub, and in one fire burn up more young trees than

could be planted in twenty years. A fire in Southern Manitoba this year (1917) destroyed 600 acres of vigorous young growth. To replant this would cost probably \$10 per acre, or \$60,000, and would require 600,000 young trees. Solely as a result of the inefficiency of a forest ranger one fire in another place ran over 14,000 acres. To replant this would cost \$140,000 and take 14,000,000 young trees. Similar cases might be cited all over the country." Excerpt from article by Mr. R. H. Campbell, Dominion Director of Forestry.

A Forest Dilemma in Australia

HON. W. G. ASHFORD,

Minister for Lands and Forests

In many respects the forest wealth of Australia is unique. In bygone years, before the settlers' axes broke the stillness of the mighty bush, the number of our trees and the variety of their species placed this island continent in the front rank of the timber-producing countries of the world, but those who had the ordering of things did not know—certainly did not appreciate—the immense waste that was being caused by the indiscriminate inroads that were made in order that people might clear the land for the grazing of herds and flocks, or for growing crops. Only in recent years has there been recognition of the importance to Australia of a systematic and stable policy of forest conservation, improvement and utilization; but even now few people take any interest in the subject of forestry as a national concern, and fewer still have troubled themselves to think why Governments reserve

large areas of land for the sake of the trees that grow and may be grown upon it.

In other words, forestry in Australia is, so far as the public, who own the forests, are concerned, a subject of no interest. The labour expended upon them is not understood; the strict rules made for their protection are often misunderstood, sometimes ridiculed, and not infrequently wilfully ignored. That is not as it should be; but the reason is not difficult to find. The people do not understand their forests; they do not know the great commercial value they are to the country; they have not been taught to look upon trees as much more than a source of supply for fuel and fencing material; and they have been satisfied that the great countries overseas should send us the timber needed for everyday requirements and take in return our good Australian gold.



One of the New Ranger Cabins in Northern Ontario

The Substitute's War on Wood

"Cement, steel, iron, tin, brick, tile, tar compositions, asphalt compositions, paper board, patent plaster, gypsum, patent roofings, floorings, patent framing—dozens of interests, hundreds of companies, and thousands of individuals are all working to the same end—to create a feeling against wood and, correspondingly, to increase the use of their goods. President to office boy, every employee, every stockholder, every co-related commercial and financial interest is working without cessation for the injury of the lumber industry in order to build up its own."

"Meanwhile, what have those who gain their livelihood out of lumber been doing?" asks the Southern Pine Association of the United States.

"Largely nothing."

"They have sat still in sweet, peaceful half-slumber, half-trance—either wholly oblivious of the fight on their property, or in a state of self-hypnosis, convincing themselves that the demand for lumber would through some magic means continue as it had in the days of prosperity, unaffected, untouched; and therefore

their incomes would likewise continue without diminution.

Who to Blame?

"The actual result has been that profits have shrunk, withered, and in many cases been transformed into losses. Jobs have grown fewer, and salaries have at least not grown. The lumber manufacturer, lumber dealer, employee, and the stockholder can all blame themselves, for all are responsible in varying degrees.

"It is only very recently that the lumbermen have come together on anything promising a national movement to protect their property. The cold blooded truth of the matter is that the average lumberman, his employees, and his business associates have been satisfied to get their living in part or whole out of lumber, without a thought of their duty toward the protection of their means of livelihood against unjust attacks.

As Prosperity Vanished

"It has required a change in the prosperity of the lumber trade to bring about a change in the attitude

of those interested in lumber. At least some of the men interested in wood have come to realize the danger confronting their business, and they are now asking you and every man and every woman who has a direct or indirect connection with the sale or manufacture of wood to give help.

"Your individual help is asked—it is needed. If you have any regard for your prosperity you will come to the front.

"How?

"With the truth—with the facts about lumber and its uses, and

with the truth and the facts about the misrepresentations that are being scattered over this country in regard to wood.

"Wood Burns" the substitute manufacturers have declared.

"Wood *does* burn!"

"And concrete crumbles, brick walls collapse, steel girders twist into bow knots, composition roofings literally blow up—under certain fire conditions. But little or nothing is ever said of the defects of the wood substitutes; it is only when wood burns that the fact is dwelt upon publicly."

The Practical Application of Scientific Forestry

BY R. O. SWEEZEY, B.Sc.; C.E..

Consulting Engineer, Montreal

A Call to Wood-Using Companies to Grapple With the Menace of a Deteriorating Forest.

Now that Canadians are really becoming impressed by the glaring facts concerning the rapid depletion of our spruce forests the question properly asked is how can we arrest such destruction?

Must we in Quebec Province, for example, stand by and see the St. Maurice valley reduced to such deplorable conditions of forest waste as we find today in the Trent Valley, the Madawaska or the slopes of Lake Huron?

We do not all realize it but it is none the less true that we are eating into our forest capital at such a rate that the St. Maurice region is but a convenient example of depletion. Like the depleted areas in Ontario its soil is dry, it is a sandy region and totally unsuited to agriculture.

If the forest cover is destroyed we will then have barren waste or at best, a most inferior type of woods that suppress the more valuable conifers.

Decrease in Fire Losses

That some realize the seriousness of the situation is evident and, thanks to the excellent co-operation of timber limit owners, fire risks are yearly becoming less severe. Despite the eminent success attending co-operative fire protection, however, we shall yet no doubt suffer heavy fire losses, which, combined with our present methods of cutting, must result in the complete abandonment of large spruce forests to inferior types like poplar and birch. Indeed even these poor types have failed to provide decent clothing for the bare slopes of large sections of Ontario and parts of the Ottawa valley. Therefore, when we observe this condition now creeping over the St. Maurice valley with accelerating progress there should be no doubt as to the outcome unless the unhealthy condition is interfered with immediately. It is even now so far gone that ere long we shall see pulp and paper mills on the

St. Maurice having to procure pulpwood from the northern forests of the lower St. Lawrence to supplement the wasted resources nearer home. Nor are these conditions alone peculiar to the St. Maurice. New Ontario is making rapid strides towards copying the destructive methods of old Ontario. Even British Columbia will wake up before long to find that statistical experts have their peculiarities.

When we realize that pulp wood and lumber operations annually cut clean an area of two to three million acres leaving little or no chance for reforestation, natural or otherwise, perhaps someone whose business it is to think of these things will "start something." All power to him when he does!

But the question persists,—what is the solution of the difficulty?

How are we to prevent the wiping out of our coniferous forests?

A Question of Cost

It is purely a question of cost—not exorbitant either. And it is not necessarily "up to" the Governments, though experience teaches that they may properly be requested to keep their politicians out of the discussion. The solution should be brought about by the manufacturers of forest products and when they convene to this end they must be permitted to co-operate without having unjust accusations of price-manipulation hurled at them. For be it understood that if Canadian forests are to be saved from destruction they must be properly managed—call it scientific or practical management, if you wish, but it will be pure common sense nevertheless. And it will cost something; just how much is difficult to estimate, but the point is that the consumer obviously must pay for it. Hitherto the cost of spruce pulpwood has been so low that the ordinary man could see no advantage in conserving something that had no particular value. Waste therefore started in the lumber camp and has been maintained right through to the

press room where it reached its maximum.

Since the forest provides the raw product for the largest industry in Canada, the manufacturer of pulp and paper with whom rests the initiative in this vital matter is about due to act in no uncertain manner for the conservation of the forest by proper management and operation.

He realizes or should realize that it takes one hundred and fifty years to grow a mature spruce forest but by taking advantage of the natural conditions offered in our existing forests the period of maximum volume growth may be perpetuated with the result that a vastly greater forest crop may be relied upon. We know, for instance, that trees grow by accretion of outer rings—adding one each year, therefore the larger the tree the greater will be the volume of accretion. The idea in operation then is to keep the forest at that stage of maximum annual increment cutting only the largest trees and leaving the other immature ones undamaged by too much thinning or insufficient cutting—a process to be guided by local conditions and under experienced men. Proper management further requires the suppression of inferior or damaging species, also seeding or planting where necessary to assist or supplement nature's efforts.

Wider Areas of Operation

All this necessitates operation each year over very large areas compared with the areas now cut clean and left to utter destruction as forest land. It will require intricate road systems, gradual cleaning up of underbrush, permanent camps and steady expansion to eventually embrace the whole of our forests—a process that must necessarily take many years to complete. The capital expenditure involved will be great but no better investment could be undertaken when considered on a permanent basis looking to the future.

Once the system is established, operating costs will become much less but, whatever happens, pulp-

wood prices will have to be maintained at a high level else its very cheapness will render it unworthy of conservation.

To this important end if manufacturers will combine and agree upon proper restrictions to be incorporated into laws of the country they will eliminate the temptation of any one firm to mine its forest area in order to liquidate at high profits.

The Reward of Conservation

No one of course is foolish enough to suppose that anything of this nature can be accomplished at one fell swoop. The change from destruction will probably pass through a stage of obstruction before entering the realm of construction. High hopes, however, may be centred upon the recently organized woodlands Section of the Canadian Pulp and Paper Association which is composed of practical and technical woods men who will gradually come round to conservative forest operation in

the strictest sense. And when they accomplish that aim our forests will be shown capable of maintaining in perpetuity a vastly greater output than at present, notwithstanding the alarming situation that threatens to reduce them to such inferior types as poplar and birch.

Consumers of wood, pulp and paper products will be well advised now to adjust themselves to an understanding and realization of conditions as they are and prepare to share the responsibility of proper forest management. And when manufacturers get together for the purposes of such commendable actions as involved in struggling to solve this problem they should be encouraged and not regarded as conspirators merely because the solution of the difficulty perforce involves commercialism. They will be promoters of a national cause as well as the protectors of their own essential industries.

R. O. Swezey

New Brunswick Launches Its Forest Service

The Government of New Brunswick is rapidly implementing its assurances of a new era in forest fire protection and public forest management by legislation now under discussion at Fredericton. An Act to establish a Provincial Forestry Advisory Commission to consist of the Minister of Lands and Mines, as Chairman, the Deputy Minister, a Provincial Forester, one licensee and a representative of the owners of Crown Granted forest lands is in course of adoption by the Legislature, and will fulfill a most valuable purpose. The function and object of the Forestry Commission will be to advise in regard to all matters relating to the administration of the Act, and to supervise all permanent appointments to the forest service. The latter will administer all statutes, rules and regulations relating to Forestry, hunting and

fishing; protection of the forests from fire; construction and maintenance of permanent improvements, such as telephone lines, look-out stations, etc., and reforestation.

Provision is made for the obligatory appointment of an examining board to consist of the Provincial Forester and two other qualified men, all appointments to have the further approval of the Forestry Commission.

A protection fund for the purposes of the Act is made to consist of \$30,000 of the revenues from the wild land taxes, $\frac{1}{2}$ cent per acre from license holders, all fees, fines and penalties collected under the Forest Fires Act and Game Act, and to this total shall be added sufficient from the consolidated revenues fund to make a protection fund of \$100,000.

The Act for Prevention of Forest Fires is comprehensive enough to safeguard the province under any

reasonably efficient administration. A system of burning "permits" is imposed on those clearing land or roadways. A penalty of \$50 is attached to acts of wilful carelessness such as the dropping of lighted matches or tobacco within or near any forest or woodlot. Provision is made for compulsory piling of slash within 300 feet of the railway track. The Act profitably appropriates certain clauses by which the Dominion Railway Act has safeguarded the territory contiguous to roads under its control from fires caused by railway smoke stacks, ash pans, etc. The clauses dealing with the inspection of railway appliances, the enforcement of railway patrol, etc., should quickly do away with the large number of fires which have caused needless losses in the past.

Editorial, Fredericton Gleaner

To what extent does the annual cut in this province exceed the

annual growth? It was said some eight years ago that the annual cut was not in excess of the annual growth, but recent information does not appear to support this opinion. If we are cutting in excess we are impairing our capital. The Minister of Lands and Mines appears to be strongly of the view that we are cutting largely in excess, for he argues that at the present rate our forest lands would be almost depleted of spruce and fir in about eighteen years, if the annual growth were not taken into consideration and the annual growth he figures at something less than five per cent. We must, therefore, proceed cautiously and prudently, seeking not only to increase production and to eliminate unnecessary waste but also to get adequate returns from the annual cut.

Planting by Dynamite

By F. Norman Supplee, Landscape Engineer.

At the Cheshire Hunt Club Kennels at Unionville, Pa., owned by Mr. W. Plunkett Stewart, considerable landscape development was undertaken.

A farm, perhaps two hundred years old, had been purchased on which the original mansion stood and the lane leading up to it was lined by 150 year old pines. With here a branch gone, there a top taken out by some severe storm, but stalwart, though gnarled, they still raised their grand heads to face the storms of the four winds. Mr. Stewart, realizing that some day these old fellows must go, decided to plant some young evergreens to take their places and then to continue from where this lane struck the public road right on up into the

opposite field with another lane of evergreens to the kennels.

In order to give a pleasanter treatment around the manse, it was decided to plant a screen separating it from the barn, and to make the houndsman's cottage more picturesque, some planning to soften its outlines and to tone down its color was made. The owner also decided upon some foundation planting around the base of the manse, with an immense group of 150 year old box in the circle of the driveway.

In the planting of the trees along the old lane, it was found to be practically impossible to dig with any expediency among the old pine tree roots. Up the new lane a ledge of rock of mica formation was struck and in the screen between the manse

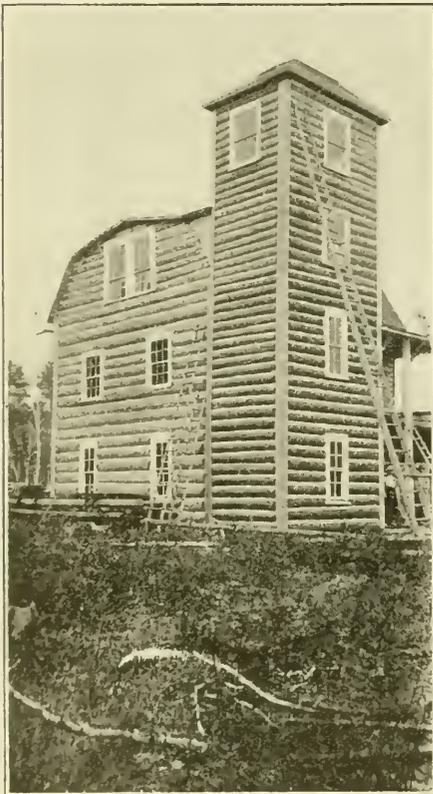
and the barn a stratum of ground, composed of large stones and clay, hammered into place, it might be said, by the wear and tear of years; therefore, dynamiting, as an easy way out, was decided upon. One-third of a stick was used for each shot with one and a half foot of fuse. Two men made the holes and one man cut and prepared the charges, and two men placed the charges in the bore holes. Two hundred and fifty trees were planted in two days with this force.

The nursery had offered a price of \$1.50 each for the planting when they realized the obstacles they were up against. The total cost

of planting with dynamite, including the cost of it, was \$98.50. Only nineteen trees were lost out of the two hundred and fifty, and that was more due to the fact that that year was the driest summer that we had had in forty years.

The next year the trees made a foot of new wood. Some of the evergreens were ten feet in height. Two years have now gone by since the planting was done and the trees planted with dynamite are a foot taller than trees of larger size which were planted a year previous to this planting but with pick and shovels.

A Log Castle Built by One Man



This is a picture of "Sterling Castle,"—not the original in Scotland, but an improvement, built by Mr. James McQuot, a hermit of White Otter Lake, Western Ontario. Mr. McQuot settled on White Otter Lake, in the wilds some forty miles north of Rainy Lake, about fourteen years ago, and immediately started to build this structure, which has but recently been completed. He cut the timber, dragged the logs to the building site, and put every log in place without any assistance whatever; in fact, he would have no assistance from any one.

The "hermit" is well known among the trappers and loggers in that part of Ontario. He is literally "monarch of all he surveys," since there are no other settlers—not even Indians—in the territory for miles around. Why he erected this pretentious abode for himself it is difficult to say. Directly across the lake from the castle he has constructed a tomb, where he wishes to be buried; and he has announced that there is a reward of fifty dollars awaiting any one who finds him dead and safely consigns him to his tomb, overlooking White Otter Lake.

The Forests of Alberta and the Public Welfare!

The forest has a relation to all the important interest in Alberta. It is a great assistance to agriculture. The farmer needs lumber for buildings, he needs fence posts, fuel and wood for various general uses. The more easily and conveniently such a supply can be provided the better. The small forest reserves throughout the prairie have been set apart for this purpose and are being protected from fire. Those that are denuded of trees will be reforested as rapidly as possible and on those covered with trees steps will be taken to introduce more valuable species where it is considered advisable. The forest reserves will supplement the supply of wood which will be grown on the prairie farms from the trees supplied by the Dominion Forestry Branch which now amounts to over four million annually.

Industrial Growth

The forest has a direct relation to the industries of the country. Sawmills, box factories, and other industries are directly dependent on the forest and can only be continued if the forests are perpetuated. The spruce and poplar of the prairie provinces are the best species for making pulp and that manufacture opens up a field for many varied products and industries. There has been a good deal of discussion of the development of water powers but there has not been enough consideration of the question of the raw material that is to form the source of supply for the upkeep of the industries to be developed by the power. It is not making too strong an assertion to say that the forests and the industries dependent thereon will be the mainstay of the northern parts of the provinces of Manitoba, Saskatchewan and Alberta if the forests are properly managed.

The regulative effects of the forest on stream flow have an important effect on the use of the streams for water power and for irrigation. Water power development is possible in almost all parts of the country and will be necessary for building up industries. Irrigation gives permanency and security to farming in such parts as have not a heavy precipitation and makes intensive farming and closer settlement a possibility.

The investigations of the Geological Survey show that the coal consumption in the prairie provinces is increasing at a much more rapid rate than the population. In considering, therefore, the future needs of the northwest provinces, it is quite evident that in a few years—unless new mines are opened—the present plants will be taxed to their full capacity.

Fuel Needs

The first need of the population is domestic fuel, and much of this is being supplied from the lignite belt. Transportation and manufacture next demand fuel for power production. Thus the per capita coal consumption will increase with added population.

As the mining of one ton of coal will require on the average about two lineal feet of mining timber and it is timber which will hardly stand a long haul it will be seen that the development of the coal mines in a very essential way depend on the protection of the forest areas.

When the lands are not of first class agricultural character the retention of lands in forest or the reproduction of the forest means the possibility of a larger population. The depopulation of the Highlands of Scotland has made a sad theme for poet and historian, but the only suggestion for improvement of conditions in this respect in that the

re-forestation of a large portion of the Highlands, combined with a system of small holdings, is the only possible outlook for an increase of population. On such lands on the continent of Europe the forests are preserved and as a consequence the population is large and fairly prosperous. With the forest in existence three or four times as many people can be supported.

The Division in Europe

To show how the matter works out in Europe the following comparison of population and percentage of area in forest will be of interest:—

	Population per square mile	Percent. of land in forest
Belgium.....	652	18.3
Germany.....	310.4	25.9
Austria.....	247	32.5
Switzerland.....	234.8	22.7
France.....	189.5	18.7
Russia (in Europe).....	64.6	31.0
Sweden.....	32.4	47.8

The area so far set apart permanently for forest purposes in the prairie provinces works out at the following percentages:—

	Population per square mile	Percent. of land in forest reserves
Manitoba.....	1.81	2.1
Saskatchewan.....	1.96	5.0
Alberta.....	1.47	13.5

It should be noted also that in spite of the considerable percentage in forest in Belgium, Germany, Switzerland and France, the import of timber is heavy even after deducting the quantity exported.

In Belgium the excess of imports over exports is more than the timber produced in the country annually.

Wood Crops

The question to be determined then is the best and most valuable product that can be got from any particular tract of land and devote it to that purpose. If wood is the most valuable crop and the most required it should be grown. If, on the other hand, the best results can be obtained from devoting the land to agriculture or to grazing that should be done. The determination of the best use of the land should not be left to chance. The experience of Europe, of the United States and of eastern Canada is a sufficient guide, for a general decision and the necessary examination to determine the question should be made without delay. In such an examination expert agricultural knowledge should co-operate with expert forestry knowledge so as to assure a determination as near as possible to the final and permanent one.

The Campaign With School Children

From a principal of a Kingston, Ont. school: "The pupils all appeared to enjoy your printed "Talk on Forestry" and when questioned, expressed a desire that they might receive more of a similar kind. These talks supply useful information and material for other "talks" by the teachers. You are to be commended for the work you have undertaken in this connection."

From a New Brunswick school principal: "Your stories for classroom use are exceptionally useful. I should like to be put on the mailing list permanently. These forestry talks are looked for in my school. I also think that a loose leaf book could be made of them and kept in the school library for future use and reference."

Scientific Fire Fighting on St. Maurice

The St. Maurice Forest Protective Association, the pioneer of the Canadian Associations, had an unusually successful year in 1917, the Annual Report of which rebounds to the credit of President Ellwood Wilsun, Manager H. Sorgius and Directors Robert F. Grant, A. Laurence De Carteret, J. M. Dalton, Charles Lebrun and J. H. Dansereau.

Mention is made that the 1917 season, while in the main we had enough dry weather to be dangerous, and more than the average number of fires. I think the reduction in the cost of extinguishing fires by extra labor is a good index of the efficiency of our organization. This cost was \$13,004.00 in 1914, \$7,329.00 in 1915, \$2,759.00 in 1916, and \$1,011.00 during the season just passed. That is, the cost has been cut in two each year progressively, and we hope that this cost will not increase in the future. It shows that the rangers, who are the backbone of our organization, have been right on their jobs, and have not had to call for much help.

"The amount of money expended per acre has not increased, in spite of the increase in the cost of labor and equipment, and we have added to our equipment and kept it in good repair. We are doing the patrolling cheaper than any other protective agency in Canada.

"We have increased our capital account by new speeder sheds and by the purchase of a storehouse and boarding house of our own at La Tuque, which saves us rent and makes accommodation for our men and equipment very much better.

"In this connection I might mention that the appearance of the country is rapidly changing since fires have been reduced and the young growth has had an oppor-

tunity to start. I have estimated that the growth average, per acre, over the whole of our territory, is at the very least ten cents per acre per annum, so that the small expenditure of 1-3 of a cent per acre is well worth while.

Over 9 Million Acres

The area patrolled was 8,049,645 acres, to which must be added 1,000,000 acres of Government lands not under license and lots taken out by settlers, also 229,800 acres which we patrolled for The Laur-entian Forest Protective Association.

The net cost of operating amounts to \$24,987.12, which is equal to less than one-third of a cent per acre.

It is gratifying to note that the cost of fire fighting during the past season was only 37% of that of season 1916, and 7% of that of season 1914.

According to the reports of our Inspectors and Rangers 217 fires occurred during the season, of which 15 required extra labor to extinguish, burning over an area of 4,341 acres; of these 287 acres were green standing timber, 216 $\frac{1}{4}$ acres young growth not yet merchantable, 2,373 $\frac{1}{2}$ acres cut over land and 1,564 $\frac{1}{4}$ acres old burn. The amount spent in fighting fire was \$1,011.75, of which the

Causes of Fires

Settlers.....	4
Drivers.....	5
Railways.....	122
Unknown.....	38
La Loutre Dam Construction.....	26
Sectionmen.....	1
Fishermen.....	8
Construction Crews.....	8
Jobber.....	2

Total

217

Educational "Drive" in Gaspé

Splendid educational work is being done this season by the Southern St. Lawrence Forest Protective Association which patrols the territory to the end of the Gaspé Peninsula. Under the stimulating leadership of Mr. W. Gerard Power, Mr. R. L. Montgomery, Mr. Simmons Brown and other directors and officers, the educational part of fire protection is being given its just due. Mr. J. D. Brulé, equipped with a modern stereopticon and a set of lantern slides, etc. furnished through the Canadian Forestry Association has combined his duties of manager of the Eastern Division with propagandist.

In the latter part of March and the first week of April he delivered no fewer than twelve illustrated lectures in the Metapedia Valley and Gaspé District and plans to hold six more meetings on the northern coast of the Peninsula.

Mr. Brulé has been dealing almost wholly with settlers who in all parts of Quebec are still a great fire menace. This is a natural condition in the

absence of educational work. Few settlers are wanton timber destroyers. The majority only need to be informed of the relation of the forests and forest industries to their personal welfare, the impoverishing local effects that follow wholesale conflagrations, and other matters in which the timber resources form a partnership with the farmer. An intelligent settler is usually careful about timber burning.

Following are some of the places visited by Mr. Brulé with the excellent record of attendance:

	Attendance
St. Gabriel, Rimouski Co.....	225
St. Francois, ".....	175
St. Marcelin, ".....	125
Ste. Angele, ".....	650
St. Leon Le Grand, Matane Co.,..	175
Ste. Florence Bonaventure.....	250
Causapscall, ".....	125
St. Luc, Matane.....	200
St. Leandre ".....	250
St. Majorique, Gaspé.....	200
L'Anse au Griffon, ".....	150
Total	2425

The Future Belongs to the Engineer

BY FRAZER S. KEITH

General Secretary, Canadian Society of Civil Engineers

"The lawyer and the politician have admittedly failed to solve the industrial relations of man to man and the relations between capital and labor. The very qualifications of mind and training that have enabled the engineer so successfully to grasp and solve any problem set before him will be called upon and required to solve and to deal with what will be, after the war, the greatest problem which we have to face.

"We find already many of the executives of large industrial con-

cerns being chosen from our own profession, and more and more will the men who have received a thorough training in technical matters be called to the high positions in industrial affairs. This will mean the opening up of a scope for the profession, giving rise to a future that will place the technical man in control of the industrial life of the nation. Coincident with that is arriving a condition whereby the engineer must, besides drawing plans and specifications, give his advice in connection with financing of any

industrial or engineering undertaking, so that the time is coming, and very soon, when the engineer, instead of receiving the reward that capital is willing to offer, will walk hand in hand with the capitalist on an equal footing, and will share in

the rewards that the other has heretofore enjoyed."

An Oak Tree in one of the Compeigne Forests, on the French War Front, is 6 ft. in diameter and 110 ft. high. It has been named "The Oak of the Allies."

Forests and Civilization

BY ELLWOOD WILSON

Forests and civilization are inseparably bound together. Not all forested countries have reached a high degree of civilization, but no unforested country has ever reached a state of culture. Egypt, Babylon, and Assyria may be mentioned as exceptions, but the probability is that they were all forested at the zenith of their progress, and that their decline may be directly attributed to the disappearance of their forest wealth. The whole north coast of Africa, Palestine, and China were at one time well forested, and, with the vanishing of the trees, these civilizations waned and are now at a low ebb. China is probably the best example of deforestation which we have. Originally a country of great wealth, both in timber and agricultural lands the removal of the woods has, over very large areas, destroyed the farms by allowing the rainfall to rush down the hillsides in the form of torrents, carrying large amounts of sand and gravel, which have covered up and destroyed the arable lands. To-day China is a desolate, treeless country, forced to use dung for fuel, and to carry on the most intensive form of agriculture in order to wring a meagre sustenance from an impoverished soil.

Where timber is removed from hills and mountains by lumbering, fire almost always follows and burns not only the timber but also the soil, right down to the rock. If the formation is not rock the situation

is far worse, for the soil is washed down year after year into the fertile valleys, destroying them completely. In the Cevennes and Pyrenees districts in France 8,000,000 acres of farm land were destroyed by floods, and a huge sum of money had to be spent by the government in reclaiming them. Where forests are removed in sandy country the wind soon strips the soil of the meagre remaining cover and carries the sand for miles over the surrounding country, converting it into a desert. This happened along the west coast of France, and millions were spent to arrest the devastation. An old friend of mine, Senor Don Ricardo Codorniu, a Spanish forester, has spent his life in this work of stemming torrents, replanting denuded mountain slopes, often carrying earth up on mule-back to start the nucleus of a future protective forest. His work in connection with drifting sands has been most interesting, especially where the sand had commenced to invade a village, burying houses in the suburbs. Wattle fences had first to be built, and between these pines were planted, and when the sand had piled up against the first line of fence this had to be raised to prevent the little trees from being buried before they could fulfil their function. Nor do we have to go so far afield to see the results of axe and fire. Travel west on the C.P.R. through Ontario; take the Canadian Northern to Lake St. John, or the

National Transcontinental to Winnipeg, and see the blackened waste which should be one of our greatest tourist attractions. On the Lievre River there is a large tract of country where the hills are of white quartz. Fire has passed over it and the rain has washed away the burnt soil, and to-day seen in summer, from a distance, they look like snow-capped peaks. There is another hill of this character at Riviere a Pierre Junction, on the Q. and L. St. J. R.R. At Lachute, Que., and along the line of the C.P.R., near Berthier Junction may be seen the drifting sands which have swept over several square miles of once fertile country, turning it into a desert. Fortunately, our progressive Minister of Lands and Forests, the Hon. Jules Allard, through his chief forester, Mr. G. C. Piche, has begun the work of checking this menace, and at Lachute has planted a large area with beech, grass, and young trees to hold back the devouring sand.

AUSTRALIA ISSUES A JOURNAL
The Canadian Forestry Journal greets the first issue of "The Australian Forestry Journal," published by the New South Wales Forestry Commission, Sydney, Australia.

The magazine represents an effort to arouse public sentiment to the importance of forestry and to disseminate information as to Australia's imperative need for conservative policies. It is bound to attain its object if the newness of the first issue is maintained.

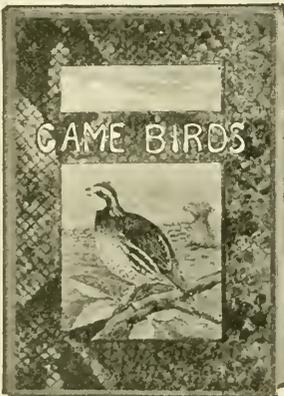
BOY SCOUT LECTURES

A number of special illustrated lectures to large assemblies of Boy Scouts is being arranged by the various headquarters of the Boy Scout movement in Ontario and Quebec for the Secretary of the Canadian Forestry Association. It is expected, also, that out-of-doors lectures will be given on Conservation topics while the boys are encamped at various outing places during the month of June.

How many North American Game Birds Can You Name?

Can You describe twenty-one kinds of ducks—six kinds of geese?

If not, there is a good time awaiting you in a copy of "Game Birds." and by a piece of good luck the price is just 50 cts. post free.



A splendid little book of 64 pages, 5 x 7 inches, made up of heavy coated paper throughout.

Forty-nine of the best illustrations in life-like natural colors you ever saw—really a beautiful piece of quadri-color printing. Decorated board covers.

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

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

FIFTY CENTS A COPY, POST FREE.

(STAMPS OR MONEY ORDER)

CANADIAN FORESTRY JOURNAL

206-207 Booth Building, Ottawa.

Widening the Field for Aeroplanes

Apropos of recent articles in these columns on the use of airplanes in forest protection, it is interesting to learn that there are at least ten thousand airplanes in constant readiness for use on the Western front, with probably thrice that number of trained pilots. When the war broke out the principal European powers had 2,786 military planes, and slightly over three thousand trained military pilots. Before peace comes, provided the United States completes its aviation construction programme, there will be not less than twenty thousand air-planes in commission, and probably sixty thousand trained pilots. Is this vast capital investment to be of no value to civilization after the war? Are the pilots to go back to their former occupation—wingless eaglets compelled to crawl on earth when they would fly in the upper blue?

Edgar C. Middleton, a pioneer aviator, whose book "Airfare," has recently been published by Constable & Company, and deals in a very thorough way with the airplane, the seaplane, and the airship in peace and war, is convinced that great aerial fleets will be built up after the war not only for the transportation of passengers and mails, but of certain classes of freight, including silks, spices, tea, furs, ivory, and similar valuable commodities. He even outlines the principal aerial trade routes from London to the East and South, the Western route across the Atlantic having still to be tried out. The Atlantic stretches are too wide to permit of airplanes as at present operated carrying either passengers or mails, the entire lifting capacity being required for the petrol necessary for the journey.

An illustration of the route to Cape Town from London by the West African aerial service is thus presented by Lieut. Middleton: Allowing a minimum average of 110 miles an hour, with light wind,

and half an hour for each landing, an airplane leaving London at 8 on a Monday morning would keep the following time-table:

London, 8 a.m., Monday.

Paris, 10 a.m., Monday.

Bordeaux, 1 p.m., Monday

Gibraltar, 8 p.m., Monday.

Fez, 9 p.m., Monday.

Lagos, 5.30 p.m., Tuesday.

Loango, 2 a.m., Wednesday.

Johannesburg, 8 p.m., Wednesday.

Cape Town, 4 a.m., Thursday.

Total time London-Cape Town 2 days, 20 hours. By steamer, via Funchal, the time taken is three weeks, which gives an advantage of two and a half weeks. Another route to Cape Town would be London-Paris-Lyons-Rome-Alexandria-Ankobar-Mombasa-Zanzibar-Bulawayo-Johannesburg-Cape Town.

STONE CROPS VS. TREES

(*Kingston Standard*)

In the days long past these districts were gone over for pine; later on for other timber; farmers settled on the partially cleared ground in order to grow supplies for the lumber camps. But theirs was terrible work; the land was unfit for proper cultivation; the "stone walls" which are to be seen there are sufficient proof of this. "Stoning" was a regular part of the farmer's and his family's work and we have been told by a man who went through this from his boyhood that he often used to stone till his fingers bled. It is little wonder that one leading agriculturist has said that every crop raised there represented blood and tears.

The Toronto Globe says that the fact has been familiar for a quarter of a century to private observers that the "ranching" of cattle is perfectly feasible on the so-called "waste" lands of Ontario, meaning those northern areas that have been stripped of their crop of valuable timber, especially the white pine.

These areas are to be found scattered over the part of the Province north of a line located approximately from the mouth of the Severn River to Sharbot Lake, and thence along the height of land northwestward and westward to the Manitoba boundary line. It goes on to say that "Of such lands, fit for the ranching of beef cattle and in some places

also of sheep, there are many millions of acres that ought to be seeded for a new crop of pine, and should, during the next half century, be devoted to the production of beef, mutton, venison and the flesh of the moose, with the very finest of freshwater fish in thousands of lakes and streams which abound perennially with water."

Settlers Still a Great Fire Factor

A striking fact in the Annual Report of the Ottawa River Forest Protective Association for 1917 is that out of 108 fires, no fewer than 40 were caused by settlers. As the result of special measures to be taken this year, however, there promises to be a reduction in this class of fires. The Ottawa River Association, Eastern Section, experienced 74 fires in May and 17 in September. Fires burned over 5,270 acres in the limits and 3,599 acres on private lands the most of it on old burns and cuttings. In addition there occurred on the western section of the Association, damage to standing timber estimated to be less than 30,000 board feet partly scorched. Only 28 fires were encountered on the western section seven of which required extra labour to extinguish. The western section shows a total of 305 acres burned over on limits and private lands.

The total area patrolled by the Ottawa River Association is now 20,967,529 acres. The total net cost of patrol was \$22,264.

BOOKS FOR THE CHILDREN

The circulation of "Twenty Canadian Trees," a book for school children or their seniors, issued about two years ago by the Canadian Forestry Association for free distribution, has reached its seventeenth thousand and will soon be over the twenty-thousand mark. Recently, Boards of Education have been purchasing extensive editions

of this little book for presentation to the senior children. The School Board of Sault Ste. Marie, Ont., ordered 1200 copies.



A modern lookout tower on the Abitibi Pulp Limit in Northern Ontario. This tower is typical of the excellent work being done this year and last by the Ontario Department of Lands, Forests and Mines in extending forest fire protection.

Fire Rangers Want Your Aid This Year!

The danger season for forest fires is at hand. Rapidly drying soil has left the old grass, brush, leaves, etc. in most perilous condition for starting fires.

An effort is being made by the fire rangers in this province to keep down the forest losses this year to a minimum. They will succeed only if every camper carefully extinguishes his camp-fire before leaving it, if every smoker refrains from tossing away burnt matches or tobacco in or near a wood, and if settlers in the newly-opened districts guard their land-clearing fires with the utmost care. Settlers' fires continue to be

the very worst source of forest conflagration, although campers and careless smokers are close competitors.

"The fire rangers," says the Canadian Forestry Association, "want every good citizen to regard himself as a deputy ranger from now until November first.

"A Canadian forest was never worth so much as to-day, never gave so many jobs as to-day, never put money into circulation as it does this year."

Sample of Bulletin used by hundreds of English and French newspapers in Canada during April.

"Passing the Buck" on a Wood Supply

Instigated, no doubt, by the U.S. Fuel Controller, the order has gone forth through Canadian Fuel Controller Magrath that those ordering their next winter's anthracite coal are to receive seventy per cent. of actual requirements, the stock on hand being taken into consideration. In other words, consumers are to have in their cellars, when stocked up, only seventy per cent. of next winter's probable consumption. It is also intimated that this order may be abrogated later on, but it will hold until further notice. Which may be taken to mean says Toronto "Saturday Night," that it will terminate only when the situation clears up, if it does. This policy is, no doubt, adopted in order that there shall be a more equal distribution throughout the continent; and it may be stated in this connection that the United States Fuel Controller is treating our various Provinces in respect to coal exactly as if we were just so many States in the American Union. There is absolutely no discrimination against

us, as with other foreign countries and as applied by the United States not only on coal but various other necessary commodities.

The very fact that a cut of thirty per cent. in our probable coal requirements for next winter is deemed necessary by the American Government, should awake us to the necessity of doing what we can to aid ourselves through our own resources. As it stands, however, we appear to have done little or nothing, preferring to pass the buck on to Uncle Sam, letting him become responsible for keeping us from freezing to death next winter. As the Provincial and the Ottawa Governments appear to have passed up the entire question, it seems necessary that our various municipalities in Ontario and Quebec take up the question of providing a certain proportion of firewood for emergencies. These organizations should be getting together now, and a couple of months hence the wood should begin to arrive, else it will be too late."

Lumberjacks on Liberty Tour

The picture shows four employees of the Brown Corporation, Berlin, N.H. and La Tuque, Quebec, who recently penetrated the snow-bound fastnesses of the lumber camps and sold war savings stamps worth \$4,185 in five days.

Equipped with a melodeon, which made up in volume of music for what it lacked in size, a violin, and hundreds of leaflets on which were printed the words of patriotic songs, these four men chartered a stout pung, painted a vivid blue, and started off on the oddest concert tour New England has ever seen.

Besides all the regular patriotic songs their repertoire included

"Over There," "Good-by Broadway, Hello France," "Keep the Home Fires Burning," "The Long, Long Trail," etc. The lumberjacks now have choral clubs. The party met temperatures of 52 below, and sometimes had to resort to snowshoes.

In all, the concert tour covered 136 miles of snow-bound country. They returned with stamps worth \$4,185 accredited to the "lumberjacks" of the North Country, and the firm conviction that the "up river" folk have as warm hearts, as lusty voices, as wideopen pocket-books, and as strong a patriotism as any to be found in the country.



LOOKING OUT FOR 1950!

A letter to Toronto Saturday Night

London, Ont., March, 1918.

Dear Sir,—Following up your timely article on the advisability of laying up a supply of wood for the coming winter, thereby avoiding another fuel shortage, would it not be well for our Ontario Government to take up the matter, if it has not already been done, of making the province a producer and not a consumer alone of this kind of fuel? Many sections of Western Ont-

ario in particular, which were once heavily wooded are now practically bare and in a few years time good timber will be as little seen as the Buffalo on our western prairies. A timber raising campaign might be started to put in a dozen or more trees of good varieties for every one moved and thus in some way meet the future requirements for timber and fuel and should as well be profitable.

Yours truly,

TRAVELLER.

AN IMPLEMENT FIRM'S WOOD REQUIREMENTS.

In a letter to the Forestry Journal, the Massey Harris Company, Toronto, state that the average annual consumption of timber in their Toronto and Brantford factories in the making of farm implements amounts to 20,000,000 board feet.

RENNIE'S War Time Production Seeds

THERE must be no "slackers" this year, either among the seeds or the growers. Every man and woman with garden space, must produce to the limit of his or her ability. And that is why Rennie's seeds are so essential—live, vigorous seeds from tested stock, to ensure record crops.

	Pkt.	¼ Oz.	Oz.	¼ lb.
BRUSSELS SPROUTS — Amager Market.....	.10		.90	2.75
CABBAGE —Rennie's First Crop..	.10		.75	2.25
CABBAGE —Early Jersey Wakefield (Improved).....	.05		.60	1.75
CAULIFLOWER —Rennie's Danish Drouth-Resisting.....	.15 & .25	1.00	3.50	10.00
CELERY —Paris Golden Yellow, Extra Select.....	.15	.60	2.00	
TOMATO —Bonny Best (Original).	.10		.60	1.75
Rennie's Improved Beefsteak..	.10		.75	2.50

FLOWER SEEDS

	Pkt.
New Giant Astermum—Mixed Colors.....	.15
Rennie's XXX Giant Comet Asters—Mixed.....	.10
Dreer's Peerless Pink Aster.....	.15
Early Blooming Cosmos—Mixed.....	.10
Rennie's XXX Exhibition Mixture Pansy.....	.25
Rennie's XXX Prize Ruffled Giant Single Petunia—Mixture.....	.25
Rennie's XXX Large Flowering Globe Stocks—Mixture...	.20
Rennie's XXX Mammoth Verbena—Mixture.....	.10
Giant Zinnia—Mixed.....	.15

**Mail Your Order
TODAY**

LOOK FOR THE STARS

Turn the pages of your Rennie catalogue. You will notice a great many paragraphs with stars at the corners. These are extra special values that defy competition. When buying from dealers insist on RENNIE'S.

THE WILLIAM RENNIE COMPANY LIMITED.
KING & MARKET STS TORONTO
ALSO AT MONTREAL WINNIPEG VANCOUVER

The Pine Tree Overseas

A pamphlet called "The Pine Tree" was issued by the Canadian Forestry Association some weeks ago, containing items of information regarding Canada's needs and progress in forest conservation. This was designed for the overseas members of the Forestry Battalions and a first edition of 1000 copies was sent to Y.M.C.A. camps, foresters, etc. in England and France. The aim of the pamphlet which will be followed up by others; was to give the rank and file a better idea of the forestry situation in their own Dominion so that what they witnessed in the forests of Europe might be properly related to home conditions.

An officer writes as follows from the 76th Co. C.F.C. in France: "I can assure you that such literature

is thoroughly appreciated by the personnel of this company and I trust we may be favored further by your kindness and thoughtfulness.

"The first leaflet of "The pine Tree" is an introduction and there can be no doubt of the great value to this and other forestry companies of further supplies of information."

Another officer in France writes: "The Pine Tree is very interesting and I have circulated copies where I thought they would do most good."

From Captain Douglas Weir, (for Director of Timber Operations) London: "Copies have been forwarded to the various officers in charge of districts for distribution among the reading huts of the camps."

FIRE EXTINGUISHERS !!

Head Off the Fire Season This Year by Employing These Lantern-Slide Sermonettes In Your Local Motion-Picture Theatre.

The Canadian Forestry Association is sending out to a large number of motion picture theatres in or near timbered districts educational films (dealing with forest fire prevention) and educational lantern slides.

We cannot cover the whole country. You know your district best. Suppose you order a dozen of the slides for your local use! They can be had at the slide-maker's price, 20 cents each. Or we will gladly prepare new reading matter applicable to your own territory, without any charge to you.

Any motion picture theatre will gladly utilize these slides between the reels of film, thus bringing sharply

to the attention of the audience the need for care with fire.

Your local theatre will show a new slide every night if you keep it supplied.

ENGLISH WALNUTS FAIL

The Persian or so-called English walnut is of commercial importance in this country only in the far Western States. In the South, it has thus far failed altogether. In the North and East it has held out gleams of hope, first bright then dull, for more than a century. There is no way of telling the number of three of this species which have been planted in the northeastern section of this country but let us imagine it to have been 60,000. Of these, fully 50 per cent. have succumbed to climatic conditions; 25 per cent. have been but semi-hardy, and possibly 25 per cent. have attained the bearing age. A part of each of the last two classes have borne crops of commercial size for a number of years.

produced nuts of good size and quality. A great many of all those surviving are now proving susceptible to a walnut blight.

A liberal estimate of the present number of Persian walnuts in this part of the country would be 10 per cent. of the original supposed 60,000 or 6,000 trees. Of these, the writer has positive knowledge of none which are now bearing

crops of nuts in such quantity, and of such size and quality and with such regularity and which have so borne for such length of time as to encourage commercial planting. Few of the Eastern grown nuts are so free from tannin as to be really pleasing to the taste or favorably comparable with the best nuts of the market.

RENNIE'S SEEDS

For Better Gardens

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

**For
Planting
Mar. 1st
to
Apr. 15th
Order
Now!**

Cabbage		pkt.	¼ oz.	½ oz.	oz.	1 lb
Danish Summer Roundhead	.10	....	....	....	0.90	2.75
Cauliflower						
Rennie's Danish Drouth-Resisting	.15 & .25	1.00	1.85	3.50	10.00	
Celery						
Paris Golden Yellow (Extra Select)	.15	.60	1.10	2.00		
Onion		pkt.	oz.	¼ lb.	lb.	
Rennie's Extra Early Red	.05	.35	1.00	3.75		
Radish —Cooper's Sparkler	.05	.20	.65	2.20		
Tomato —Market King	.10	.60	1.75			
Rennie's Improved Beefsteak	.10	.75	2.50			
Pansy —Rennie's XXX Exhibition Mixture	.....					.25
Sweet Peas —Rennie's XXX Spencer Mixture	...					.15
Nasturtium —Rennie's XXX Chameleon Mixture	.....					.10
Stocks —Rennie's XXX Large Flowering Globe Mixture	.....					.20

LOOK FOR THE STARS

Our 1918 Catalogue should be in your hand by now. It is your patriotic duty to consult it at every opportunity. Our Government insists we must produce more. Start right, then, and be sure and sow good seed—RENNIE'S SEEDS. Look for the special star border bargains in our Catalogue—it will pay you to do so.

THE WILLIAM RENNIE COMPANY LIMITED.
KING & MARKET STS TORONTO
 ALSO AT MONTREAL WINNIPEG VANCOUVER

He Would Conscript Beaver as Fire Rangers

(An Article by a Detroit Ranger in the North Woods.)

While beaver have generally been considered somewhat hostile to the inroads of civilization and averse to having near neighbors, it has occurred to the writer from observations made this summer that they might be prevailed upon, albeit unconsciously, to relinquish this theory, and turn their well known industry to good advantage in the development of this district.

It has been my privilege, while covering my district during the past year, to see considerable of a beaver colony and their work. This particular colony has chosen as a home, Judicial Ditch No. 13, the main drainage ditch in the lower Rapid river district one-half mile south of Baudette and Spooner, on one of the three main highways leading to the two towns.

The dam is about thirty feet long and holds about a nine-foot head of water. Not having access to green popple, which is their preference for food and construction work, they have adapted themselves to their surroundings, and have cut the scrub alder and willow from the ditch bank and skidded dry tamarack and spruce from adjoining lands. Combining this with a good supply of weeds and mud, they have constructed a dam that is almost as impervious as concrete. Settlers have in a number of instances been compelled to destroy part of the dam, as it hinders drainage for a distance of about two miles, but invariably the following morning the dam is complete and full of water. One evening last week while going in an auto, it was necessary to stop the machine in order to make way for a big husky who was trying to drag a large tamarack across the road. We ran the machine up to within twenty-feet of him, but he tenaciously

hung on until the log was landed in the pond, and then quickly disappeared.

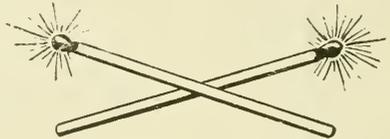
The point I wish to bring out is that it might be an excellent idea to press a few of these fellows into service, and have them conserve the water at strategic points for use on these peat-grade fires which are causing us no end of trouble just at present.

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

ASK



FOR



Dry Matches

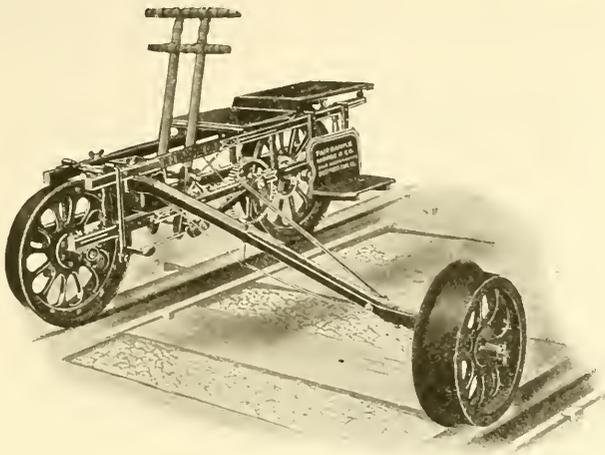
After all day in a boat, rainstorm or wet snow. Ask your dealer for

MARBLE'S

WATERPROOF MATCH BOX

If he can't supply you, we will send prepaid for his name and 50 cents. Dry matches may save your life.

MARBLE ARMS MFG. Co.
Dept. 5160 Gladstone, Mich., U.S.A.



F-M Speeder

Easy Running---Durable

The F-M Speeder is easy running and durable because it is carefully built and it is equipped with ball bearings and accurately machine cut gears.

These machines aid Government and Railway Forestry Officers to easily cover their routes and reach an objective quickly.

*For Further Information please
address our nearest house. . .*

The Canadian Fairbanks-Morse Co., Limited

"Canada's Departmental House for Mechanical Goods."

St John, Quebec, Montreal, Ottawa, Toronto, Hamilton,
Windsor, Winnipeg, Saskatoon, Calgary, Vancouver, Victoria

A Free Lecture in Your Locality on "Guarding the Forests"

The Canadian Forestry Association provides free of charge special lecture outfits consisting of 56 photographic lantern slides (many in colors) and a complete manuscript. Can you make use of this in your locality?

These 'forest travelogues' have proved of lively interest wherever shown. The Manuscript discusses entertainingly the subject of forests, forest industries, fire rangers, lessons from home and abroad, the trail of the Fire Demon, etc. For each lantern slide a descriptive paragraph is provided.

Anyone having a stereopticon can give the lecture effectively and there is no dull material in it. A 'forest travelogue' in French will presently be available.

Arrangements have been made for the purchase and
circuiting of motion picture reels showing forests in
flames, and old and new methods of fire prevention.

An Ontario school principal said of our lecture outfit: "We all enjoyed the scenes, and ideas expressed in the lecture were timely and instructive."

From a Quebec user: "We gave the lecture at two points and everybody was much pleased."

From a Western clergyman: "I gave the lecture before the Boy Scouts and again before my congregation. They all liked it greatly and I congratulate the Association for taking this excellent means of awakening the public."

CANADIAN FORESTRY ASSOCIATION

206-7 BOOTH BUILDING, OTTAWA.

TREES, SHRUBS AND SEEDS

Hardy Northern Trees and Shrubs at Lowest Prices. Native and Foreign Tree Seeds

EDYE-DE-HURST & SON, DENNYHURST

DRYDEN, ONT. Shippers to H. M. Government, Etc. Correspondence Francaise.

Hill's Seedlings and Transplants

ALSO Tree Seeds for Reforesting. Best for over half a century. Immense stock of leading hardy sorts at low prices. Write for price list and mention this magazine.

Forest Planters Guide Free.

The D. Hill Nursery Co., Evergreen Specialists
Largest Growers in America.

Box 503 Dundee, Ill., U.S.A.

Try This Stump Puller at Our Risk

The Smith Stump Puller will take out every tree and stump by the roots, clearing from one to three acres a day, doing the work of twenty men. We want you to send for our 3 year guarantee against breakage and our free trial proposition. Address

W. Smith Grubber Co.
11 Smith Sta.
LaCrescent, Minn.



YALE UNIVERSITY FOREST SCHOOL

NEW HAVEN, CONNECTICUT, U.S.A.

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

For further information address

JAMES W. TOUMEY, Director
New Haven - Connecticut



On the North fork of the North Saskatchewan River. The common consequences of a forest fire: a "mine" of maturing timber wrecked in a few hours.

PERFECTION SLEEPING BAG WITH PNEUMATIC MATTRESS

These evenly-soft air mattresses may be used on damp ground with perfect safety—they are non-absorbent. And they are absolutely sanitary, with no place for dust or vermin to collect. Easily deflated and inflated—may be rolled into a small light bundle and easily carried in and out of the house. Last indefinitely. Invaluable for motor, yachting and camping trips. Endorsed by the Federal Government.

Write for Catalog and endorsements to-day.

Pneumatic Mfg. Co. 537 17th Street, BROOKLYN, N. Y.



CONFEDERATION LIFE ASSOCIATION UNCONDITIONAL ACCUMULATION POLICIES

Are liberal up-to-date contracts which guarantee to the insured every benefit consistent with safety.

Write for Particulars

which will gladly be furnished by any representative of the company or the

HEAD OFFICE, TORONTO



QUEEN'S UNIVERSITY

KINGSTON
ONTARIO

ARTS MEDICINE
EDUCATION
APPLIED SCIENCE

Mining, Chemical, Civil, Mechanical and
Electrical Engineering.

HOME STUDY

Arts Course by correspondence. Degree with
one year's attendance.

Summer School **Navigation School**
July and August. December to April.

GEO. Y. CHOWN,
Registrar.

MINIATURE CONSTRUCTION

Landscape, Mechanical and Architectural Models, Topographical Maps and Paintings. for

SCHOOLS — COLLEGES — MUSEUMS
Government work a specialty

MORGAN BROS. CO., Inc.

MODEL MAKERS

Room 1650 Grand Central Terminal
Phone 7720 Murray Hill

NEW YORK CITY

UNIVERSITY OF NEW BRUNSWICK

FREDERICTON, N.B.

DEPARTMENT OF FORESTRY

Established in 1908

Best of facilities for definite instruction and supervision in Practical Forestry.

Surveying, cruising and construction work carried on in our own tract of 3600 acres, with Forestry Camp in the centre.

Competent men from the School at present in demand to take up Forest Survey work with the Provincial Crown Land Department.

For further information address :

DEPARTMENT OF FORESTRY

University Calendar furnished on application.

C. C. JONES, Chancellor.

R. O. SWEEZEY

(B. Sc., M. Can. Soc. C.E.)

CONSULTING ENGINEER.

Water Powers. Timber Lands.
Financing Forest Industries.

164 St. James St. MONTREAL.

YOU SHOULD HAVE THESE HELPS!

They contain up-to-date information covering the various branches of forestry, and have been written by men who are recognized as authorities in their respective fields. Your library will be complete with copies of these books.

HANDBOOK FOR RANGERS AND WOODSMEN.

By Jay L. B. Taylor.

A helpful guide to all engaged in woods work, and those whose recreation takes them into rough and unsettled regions. It covers thoroughly the essential problems of woods work, and explains all unusual trade or professional terms.

429 pages, 4¼ x 6¾, 236 figures. Flexible binding, \$2.50 net.

THE THEORY AND PRACTICE OF WORKING PLANS.

Second Edition, Thoroughly Revised.

By A. B. Recknagel, B.A., M.F.

This book is the result of the author's study abroad and the experience gained in years of work for the forest service in various parts of the United States.

279 pages, 6 x 9, illustrated. Cloth, \$2.00 net.

LOGGING.

By Ralph Clement Bryant, F.E., M.A.

This book covers the principles and general methods of operation in the United States.

608 pages, 6 x 9, illustrated. Cloth, \$3.50 net.

FOREST PHYSIOGRAPHY.

By Isaiah Bowman, Ph.D.

Covers the physiography of the United States and principles of soils in relation to forestry.

781 pages, 6 x 9, illustrated. Cloth, \$5.00 net.

FOREST VALUATION.

By Herman Haupt Chapman, M.F.

310 pages, 6 x 9. Cloth, \$2.00 net.

MECHANICAL PROPERTIES OF WOOD.

By Samuel Record, M.A., M.F.

173 pages, 6 x 9, illustrated. Cloth, \$1.75 net.

Canadian Forestry Journal

206-7 Booth Bldg., OTTAWA.

A Live Book on Our Wild Animals at a Bargain Price!



During the bright spring days there is opportunity for burnishing up your half-forgotten knowledge of our Canadian wild animals and for learning a hundred things you never suspected before.

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

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

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

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

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

Canadian Forestry Journal, Ottawa.

Please send copy of 'The Animal Guide' in leather binding to the following address. One dollar is enclosed.

Name

Address



This type is not commonly recommended for inland situations. Some years ago, the steamer ran on the Lesser Slave Lake but was 'scrapped' when the railway arrived. The fire rangers have found it quite a convenient look-out tower and have appropriated it as a piece of equipment unmatched on any other fire district.

P. L. BUTTRICK

CONSULTING FORESTER

NEW HAVEN, CONN., U. S. A.

P. O. BOX 607

TIMBER ESTIMATES

UTILIZATION STUDIES

PLANTING PLANS

Landscape and General Forestry Work.

Eight years experience in practical forestry work of all sorts.

PHILIP T. COOLIDGE

FORESTER

Timber Estimating and Mapping.

Supervision of Lumber Contracts.

Surveying. - - Forest Planting.

STETSON BLDG., 31 CENTRAL ST.
BANGOR, MAINE.

Useful Forestry Books

FERGUSON—FARM FORESTRY

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

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

KINNEY—THE DEVELOPMENT OF FOREST LAW IN AMERICA

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

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

KINNEY—THE ESSENTIALS OF AMERICAN TIMBER LAW

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

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

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

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

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

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

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

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

TAYLOR—HANDBOOK FOR RANGERS AND WOODSMEN

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

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



PETERBOROUGH CANOES

For service our Canvas Covered Canoes are unequalled. We make a complete line of Canoes, Skiffs and Motor Craft. Our catalogue will be of interest to you.



Peterborough Canoe Co., Ltd., Peterborough, Canada



(Successors to Metropolitan Air Goods Co.)

SLEEP ON AIR with a COMFORT SLEEPING POCKET

Recommended by the Forest Service, Campers, Physicians, Invalids, Tuberculosis Patients and Sportsmen everywhere. A warm, dry, comfortable bed. Wind, rain, cold and water-proof. Packs 6 x 25. Air goods for home, camp, yacht, canoe, etc. Illustrated Circular Free by mentioning Canadian Forestry Journal.

ATHOL MANUFACTURING CO.,
ATHOL, MASS., U.S.A.

Dealers write

FOREST TELEPHONES



Make the life of the forester better worth living. They relieve him from the appalling loneliness. They help him to keep in human voice touch with foresters miles away.

In emergencies—fire—sickness—hunger—the speed with which they can summon help is marvellous.

Write for full particulars of how to install the Northern Electric Forest Telephone System. Address the Office nearest you.

Northern Electric Company
LIMITED

Montreal	Toronto	Regina
Halifax	London	Calgary
Ottawa	Winnipeg	Vancouver

Northern Electric Forest Telephones

Canadian Forestry Journal

Vol. XIV
FACULTY OF FORESTRY

MAY, 1918

No. 5

JUN 4 1918

UNIVERSITY OF TORONTO



Our National Precept: "GREATER PRODUCTION."

TENTS IN EVERY STYLE

May be had made up of
the celebrated



Write for Samples and Prices.

The Woods Manufacturing Co., Ltd.

FORMERLY SMART-WOODS, LTD.

OTTAWA - TORONTO - MONTREAL - WINNIPEG

THE UNIVERSITY OF TORONTO

AND

UNIVERSITY COLLEGE

WITH WHICH ARE FEDERATED

VICTORIA, TRINITY, ST. MICHAEL'S
KNOX and WYCLIFFE
COLLEGES

FACULTIES OF

ARTS

APPLIED SCIENCE

MEDICINE

EDUCATION

HOUSEHOLD SCIENCE

FORESTRY

For further information, apply to the Registrar of the University,
or to the Secretaries of the respective Faculties.

Canadian Forestry Journal

CIRCULATION 6500 COPIES MONTHLY

Vol. XIV.

WOODSTOCK ONT., MAY, 1918

No. 5

CONTENTS FOR MAY

“Britain Turns to Canada’s Forests”

“Russia’s Grip on Britain”

“Farming Muck Lands”

“The Control of Foliage-Eating Insects Under Forest Conditions”

By John D. Tothill.

“Facing the Truth of Forest Exhaustion”

“Forests of South May Last 25 Years”

“Wooden Fences and Yard Improvement”

“‘Going it Blind’ on Fuel Supply”

“A Model Municipal Wood Yard”

“The Fire Fighter’s Profession”

By E. T. Allen.

“The New State-Sense and Conservation”

“The Menace to Our White Pine”

By Prof. J. H. Faull, Ph. D., University of Toronto

“Firmer Handling of Crown Forests”

“Forestry and the War”

By Dr. B. E. Fernow.

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

Address all Communications to

THE CANADIAN FORESTRY JOURNAL

206-207 BOOTH BUILDING, OTTAWA

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

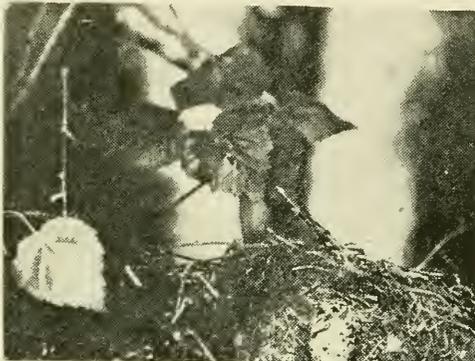
Entered at the Post Office at Woodstock, Ont., as second-class matter.



Black Tern Incubating



Canada Jay



Solitary Sandpiper's Nest With Egg



Holboell's Grebe Incubating



Young Loon With Unhatched Egg

Britain Turns to Canada's Forests

An Imperial Call to Stop Deterioration of Canadian Forest Resources and Realize New Profits.

"There appears to be no reason why the Canadian forests should not supply the United Kingdom with coniferous timber and meet its growing needs for many generations.

"Meanwhile the forest capital of Canada is growing less year by year. This we submit, is an Imperial question of the first magnitude which deserves the immediate attention of the Imperial and Dominion Governments."

The foregoing statement sums up a conclusion of the Forestry Sub-Committee of the British Reconstruction Committee which has particular interest for Canadians. Probably few readers of the Forestry Journal have thought in times past that the forests of Canada held such a vital relation to the needs of the Mother Country. Yet the fact cannot be contraverted that Great Britain has been to the extent of 60% of her daily needs at the mercy of the Russian timber exporter. Who shall say in these uncertain times what degree of freedom the Russian exporter will enjoy during the next ten years at the hands of his German master? The radical re-arrangement of the political conditions in Russia has given new weight entirely to the counsels of those Canadians who have striven for a larger share of Britain's timber orders even in face of obviously higher freight rates. At the same time if the Canadian people are to take any profit whatever from the conclusions of the British Reconstruction Committee, they will have to recognize that no permanent trade arrangement in timber supplies can be founded upon a deteriorating source of raw materials. Canada cannot reasonably present any plea for a greater proportion of John Bull's timber trade until some guarantee can be given that

the forestry policies and practices of the country are capable of assuring permanence in production of forest materials.

At Russia's Mercy

The Forestry Sub-Committee was composed of men of unquestioned standing and practical knowledge of world wide conditions, such as Lord Lovat, Sir John Stirling-Maxwell, Sir William Schlich, Lord Cavendish, Hon. F. D. Acland, and others.

"The United Kingdom," they observe, "is dependent for more than 60 per cent. of its timber on the virgin forests of foreign countries which are being steadily depleted. The proportion derived from sources within the Empire fell from 22 per cent. in 1899 to 10 per cent. in 1913. Every year we become more dependent on Russia, which in 1913 supplied us with nearly half our total imports. We have no means of reckoning how long the virgin forests will last, but unless they are brought under systematic management their exhaustion can only be a question of time. The arguments advanced on this subject by competent students have been supported since 1895 by a steady rise in price.

Canada's Importance

The only large reserves within the British Empire are those of Canada which are rapidly being depleted by fire. The Dominion Government has initiated measures for their protection, but the problem is both large and difficult. It is one in which the United Kingdom has a deep interest since the Canadian reserves are the only source on which the United Kingdom can fall back if supplies from Russia fail. The arrangement prevailing before the war under which the exports from the Canadian forests were absorbed by, the United States, while the

United Kingdom, drew its supplies from Russia, no doubt found much justification in economy of transport, but unless the Canadian forests can be adequately protected and made available in case of necessity for the United Kingdom, it is certain that the area of timber within the British Isles must be increased far beyond that recommended in the proposals made in the following pages. We commend this Imperial question

to the attention of the Conference meeting in London.

"It is urgent because preparations made now cannot mature for many years, and unless provision is made now either in Canada, Russia or the British Isles, it is practically certain that the United Kingdom will find timber difficult to procure in sufficient quantities before such preparations can mature."

Russia's Grip on Britain

"Russia, as will be evident from the facts already given," continues the Forestry Sub-Committee, "is now the crux of the whole question. She is, and has been for several years, the only source on which we could, under present conditions, rely to make good the decline in our imports of coniferous timber from other countries and meet our ever-expanding demand. She has accomplished this by increasing her supplies to us from 2,241,000 loads in 1889 to 5,401,000 loads in the year preceding the war. We have now reached the point when any check in the Russian supply would inevitably cause a timber famine in the United Kingdom."

The Russian forests are something of a mystery, and the reports which reach us are conflicting. The area of land classed as forest in Russia and Siberia is enormous, amounting to 1,260,000 square miles, of which by far the greater part belongs to the State. Much of the so-called forest is without commercial value. Of the million square miles belonging to the State, less than two-thirds are true forest land. Applying this proportion to the whole area the total extent of true forest land in Russia and Siberia is estimated at 811,000 square miles. To this must be added 82,000 square miles of forest in Finland, making a total of 896,000 square miles for the Russian Empire. These forests spread over a very wide area and in climates ranging from temperate to arctic,

vary greatly in the amount of timber they carry and in the rate of growth. The forests of Central Russia appear to be generally of poor quality, and with regard to Siberia railway construction on a large scale would be necessary to make its timber available for export. Devastation by the inhabitants and fires have also deprived a great part of the Siberian forests of their value. The timber imported into the United Kingdom has hitherto come from the virgin provinces and from Archangel. While the information at our disposal indicates that the timber produced by these northern forests could be very considerably increased without exceeding the annual growth, it is evident that permanency of the supply must depend on the introduction of systematic management. The growth in the northern forests is extremely slow and it will take a long time to replace the pine, spruce and larch now being felled. It must also be remembered that the development of the Russian Empire is certain to be accompanied by an increased home consumption, which may, as in the United States, gradually curtail or even, extinguish the reserves available for export. We have already indicated what this would mean for the United Kingdom.

Planting Programme

The Sub-Committee recommends the immediate institution of a planting programme to cover 1,770,000

acres of waste land, two thirds to be planted within the first forty years. It is estimated that probably

£15,000,000 will have to be invested in the project over a forty year period.

Farming Muck Lands

Some Practical Suggestions Applicable to Clay-belt Development in Ontario and Quebec.

BY DR. B. E. FERNOW

In these days of movements to make the extensive peat bogs of the Dominion useful for fuel and to provide for the settlement on farms of returned soldiers, it is of interest to inquire also into the agricultural possibilities of these muck lands.

The first thing to realize is that such lands are a specialty and a specialized study of their nature and their requirements must precede the attempt at farming them. They are a rich resource if properly treated, but without this proper, special knowledge enormous waste of human energy may be experienced in futile attempts to farm them. Attempts at settlement on these lands without that knowledge may prove a disaster.

The United States Department of Agriculture has lately brought together information on this subject in a bulletin* The information is simply a record of actual happenings, not of theories or scientific investigations. While the experiences may perhaps not be immediately translated for use in the clay belt, for instance, they are suggestive as to the difficulties and the possibilities of such farming.

An analysis of the results of 140, muck-land farms in Southern Michigan and Northern Indiana leads to the following summary:

1. The muck soil of this region is well suited to the growing of celery, onions, peppermint, cabbage, corn, and hay, and, when properly fer-

tilized or manured, is fairly well adapted to oats, wheat, and rye.

2. The use of fertilizer, especially potash, on muck soils is very profitable, the yields being increased in most cases from 50 to 200 per cent. Manure also gives excellent results.

3. Celery and onions require an enormous amount of man labor as compared with corn, oats, and hay. Peppermint, cabbage, and potatoes occupy an intermediate position with regard to man labor.

4. The gross acre value of intensive crops is high, but the value of these crops per day of man labor is not as high as in the case of extensive crops.

5. The average labor income for 28 celery farms was \$394; for 23 onion farms, \$1,732; for 10 peppermint farms, \$1,519; for 39 grain and stock farms, \$1,056; and for 7 of the more successful grain - and - stock farms, \$1,994.

6. Grain and stock farming is a much safer type of farming than any intensive type, although the profits per acre may be much less.

7. A small muck farm, even though operated intensively will usually return only a moderate labor income.

8. Tile drains were used on most of the muck farms studied. The best results have been obtained with 5 or 6 inch laterals laid 5 to 12 rods apart and at a depth of 3½ to 4 feet, although small open ditches are very satisfactory in some cases, especially on the celery farms.

9. The growing season on muck land is considerably shorter than on other land in the same region, on account of later frosts in the spring and earlier frosts in the fall.

*Farmers' Bulletin No. 761, U. S. Dept. Agr., 1916, pp. 26. Management of Muck-Land Farms in Northern Indiana and Southern Michigan, by H. R. Smalley.

10. Nearness to a market or shipping point is of great importance in the profitable production of truck crops.

The intensive crops of vegetables require an enormous amount of labor, and hence on that ground alone will have to be ruled out. Moreover, the market is only limited, even if it were near enough.

Difference in Labor

An interesting table shows that, while hay, oats, rye, wheat can be grown with less than five labor days per acre, potatoes require nearly double and other vegetables up to six and eight times the labor. While one man may tend as much as 75 acres of the first mentioned crops he may not handle more than five of celery and onions. The farmer who has to depend largely on his own labor will almost invariably make better labor income from the extensive crops, so that, while the average per acre production of 100 farms showed somewhat over \$18 for extensive crops, and nearly \$102 for intensive crops, the result per day of man labor was \$8.73 for the former and only \$5.54 for the latter.

Clearing muck-land of a growth of tamarack, black ash or elm is found to cost \$15 to \$30 per acre, but in some cases going up to \$75 and \$100.

All muck-land must, of course, be drained. The rapid settling of new muck-land necessitates the laying of tile drains deeper than usual (3.5 to 4 feet). If placed nearer the surface, uneven settling of the soil will frequently throw the tile out of line, thus ruining the drain. Open ditches may, of course, answer for a temporary measure.

Next to drainage, fertilizing or manuring is the most important factor in determining crop production on muck-land, even on the mild hardwood muck to which this study refers.

"Many muck soils have produced fairly good crops for a year or two, after which production diminishes rapidly unless fertilizers or manures are applied." The deficiency is mainly in potash and phosphates. "The most experienced muck farmers

use fertilizers from the very start without waiting to see if a crop can be produced without it." From 100 to 200 pounds of muriate of potash per acre are needed for small grain crop every two or three years. This expenditure is, however, reflected in the increased yield; without potash, muck soils usually produce very light crops.

Compacting the muck by means of heavy rollers does not only produce a better seedbed, but is claimed to reduce danger from frost.

Details of soil management are given which every muck soil farmer ought to study. While the conditions in the clay belt may differ, there is much suggestive advice found in this bulletin.

B. E. FERNOW.

BRITISH FORESTS IN WAR-TIME

A wholesale destruction of woods was going on in the country, said Major Couthope, M.P., at the annual meeting of the Royal Society for the Protection of Birds. "Tens of thousands of acres of woods have been destroyed, but in many cases the destruction is hidden by means of leaving narrow belts of trees. By this time next year there will be comparatively little soft-wood timber left in the country, and hardwood timber will have very much decreased. The stumps of the recently felled trees provide breeding grounds for insects."

BRITAIN'S 4 PER CENT.

The inadequate provision of the forests of the United Kingdom for national needs is shown by the fact that only Portugal of all European countries ranks lower than Britain in percentage of total area under forest. Great Britain has just 4 per cent. in woods, Sweden 47 per cent., Russia in Europe 37, Germany, 25, Norway 21, France 18.



LAKE OF THE WOODS

Some Notes on the Control of Foliage Eating Insects Under Forest Conditions

BY JOHN D. TOTHILL

*In Charge of Natural Control Investigation, Entomological
Branch, Department of Agriculture*

How many readers have witnessed an insect outbreak in the woods? Swarms of caterpillars; trees for miles stripped of nearly all their greenery; and a sense of depression like that produced by a forest newly swept by fire! Outbreaks of this character occur at irregular intervals on most of our valuable forest trees. At such times the losses involved are often very great.

About thirty years ago, for instance, an outbreak of saw flies occurred on the larch or tamarack in New Burnswick. The insects were present in such numbers that practically the entire tamarack stand was killed and since that time the tamarack swamps have been practically unproductive. In recent years the same

forest area has been exposed to an outbreak of the spruce budmoth. This has resulted in the weakening and death of a large proportion of balsam fir (*Abies balsamea*) now of great value for the production of pulp. In this case the loss involved will probably be greater than the sum total of fire damage for the past fifty years in the forests of the same Province. Other cases could be cited for all our Canadian forest regions, but these two cases will serve perhaps to indicate how great are the losses often resulting from outbreaks of forest insects.

Camping in woods rendered desolate by an insect outbreak and far from human habitation, one is faced with the apparent hopelessness of the situation. Cre-

osoting of egg masses, tanglefooting of trees, spraying of trees, intensive forestry practice, and all such methods are simply out of the question. Can anything else be done to control, or better still, to prevent such damage? An answer can perhaps be found by considering the nature of an insect outbreak.

In the case of any particular insect, the struggle for existence is so intense that an outbreak is usually impossible. New Brunswick, for instance, probably supports at least ten thousand different kinds of insect but the competition for a livelihood is so keen that most of them are uncommon or rare. An outbreak then results from a set of peculiar conditions favoring a particular species.

A great many different factors tend to keep insects in a condition of numerical stability or control, or, in other words, to prevent outbreaks. The more important of these factors I will rapidly review.

In the first place the vagaries of climate are powerful factors in control. Hailstorms in July will sometimes free acres of forest lands from a destructive caterpillar. Ever so light a frost in June will often kill millions of tender larvae. In fact 'unusual' weather at any time is liable to produce direful results in the insect world.

Value of Birds

The useful work of insectivorous birds can scarcely be over estimated, particularly in reducing the numbers of succulent larvae feeding in the north woods. The wood warblers are pre-eminently useful in this respect as any one can testify who has camped in June and July beside one of the countless brooks in the north woods region. From dawn until the day grows hot groups of these shy little birds may be seen busily searching out a meal of insects from the leaves, from the twigs, or from the bark according to their respective preference.

Then again epidemic diseases play an important part in reducing the numbers of insects. With the insects

unduly abundant and the weather conditions favorable for incubating the fungus or bacteria organisms, causing these epidemics such a death rate may result that statistics for the great plague of London or for any human epidemic, recounted in history pale into significance. At times, indeed, injurious insects are locally exterminated in this way.

Predatory Insects

Other powerful aids in reducing the numerical strength of certain kinds of injurious insects are the predatory mites and insects. In the case of the oyster shell or mussel scale, for instance, the most important single factor in control in Eastern Canada and many other places is a tiny eight legged mite. This little organism ekes out an existence by feeding on healthy eggs of the scale. In this way the scale is often reduced from a condition of great numerical abundance to one of extreme scarcity. As to predatory insects the importance of their work can be likened in a general way to that of insectivorous birds. In a favorable year such insects were estimated to destroy three quarters of the entire forest tent caterpillar crop of New Brunswick and better tribute could scarce be paid.

No account of the factors tending to reduce or prevent insect outbreaks would be complete without referring to the work of insect parasites. Among all the insects of the earth there are two groups that stand out from the rest on account of a method of existence involving parasitism on other insects. I refer to the parasitic two-winged flies (Diptera) and to the parasitic four-winged flies (Hymenoptera). In Canada there are several thousand species of such parasites and they are among the most useful members of our wild life. Some of them attack eggs, others small larvae, others older larvae, and some again attack only pupae; so that an insect like the forest tent caterpillar is liable to attack by parasites in any of its first three stages. Any of my readers who have tried to rear adult insects

from larvae or from eggs will know how effective the parasites often are. In the northern woods, under average conditions, these insects cause an immense annual mortality among such pests as the fall webworm, forest tent caterpillar, and spruce budmoth. Under particularly favorable conditions these parasites may so supplement the work of other factors in control as to all but eliminate such an injurious insect as the forest tent caterpillar from an area as large as New Brunswick.

Thus the actual killing value of insect parasites is fully as great as that of any of the various factors making for numerical reduction of injurious forest insects. It may be noted, moreover, that the parasites, and, to a lesser extent, the predacious insects, are distinguished by having a regulative value in control. When the forest tent caterpillar, for instance, is scarce in a district it is usually true that the percentage of parasitism is low; when such a caterpillar increases so, as a rule, does the percentage of parasitism. Thus the tendency of these organisms is to keep their food supply neither exceedingly scarce nor overly plentiful.

A Disturbed Balance

With this kaleidoscopic and necessarily sketchy review of the more important restraining influences upon insect activity in the woods, we have a clue to the causes of insect outbreaks. Outbreaks result when for some reason one or more of these restraining influences have not come into play. Probably more often than not, the prime cause of an outbreak is a lack of insect parasites before the insect host concerned is noticeably abundant. When an abundant insect is suddenly eliminated by climatic vagaries, or epidemic diseases, or what not, over a comparatively large area such as Prince Edward Island, the parasites are also eliminated from the same area, that is, they perish of starvation. If into such a parasite-free area a few moths be subsequently blown, their progeny in a few years' time may produce an outbreak.

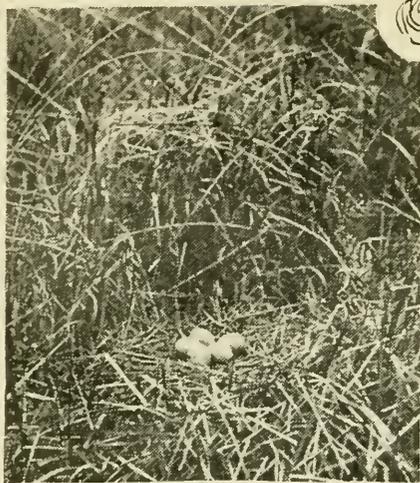
With a consideration of the nature of an insect outbreak in mind it is now possible perhaps to answer the question as to whether or not anything can be done in a practical way to control, or better still to prevent, insect outbreaks. Man is impotent to manipulate the vagaries of weather or to do very much in the way of starting epidemic diseases. He can, however, and should to the utmost of his ability encourage and protect insectivorous birds.

Distributing Parasites

Moreover, through a knowledge of the insect parasites and insect predators of given destructive species throughout their geographical range, he may in many cases discover that certain of these parasitic or predatory species present in one part of the insect host's range are lacking in another. By collecting, transporting and colonizing such species, he may help to check or may even prevent outbreaks. Such operations must of course be based upon careful study. The Dominion Entomological Service has an unusually clear-cut case of this kind under consideration at present. The forest tent caterpillar which ranges from coast to coast through the Canadian forest regions is at present comparatively uncommon in most of this range. At Sylvan Lake, Alberta, however, an outbreak of the insect has been in progress for some three years. Upon investigation it was discovered that none of the insect parasites effecting this forest pest in other parts of the country were operating there. It is proposed that certain of these parasites, known to be abundant on the lower end of Vancouver Island, be colonized at Sylvan Lake.

WOOD MEAL MANUFACTURE

The production of wood meal as a foodstuff will soon be realized. A factory for this purpose is connected with the eastern army headquarters at Souvaki; there are two factories using **Steffen's** method, and another being built. The War Commit for Cattle Food Substitutes controls the use of this meal.—German officer report.



American Bittern Nest and Eggs



American Bittern Hiding



American Bittern Shielding Her Young



American Bittern Watching Photographer



American Bittern With Young



Facing The Truth of Forest Exhaustion

United States Lumbermen Invite Scientific Guidance in Cutting and Logging.

In any "alarmist" statement regarding depletion of the Canadian forest resources are several patent dangers to the cause of conservation. At the same time, the great millstone on the conservation cause in Canada undoubtedly is to be found in the public belief that the forest supply is practically illimitable. A deep rooted conviction that we are drawing our wood supplies from an inexhaustible bank account is the real factor behind public indifference and administrative slothfulness.

To demonstrate that Canadian white pine for example is being cut and burned without provision for reproduction may suggest to some persons that they should ask their dealer for wood substitutes, to replace boards with cement and shingles with asbestos. The very contrary is the conservationist's purpose, for he is an advocate of the most thorough utilization of forest products, and has no brief for the wood substitutor. Obviously the greater the public demand for wood products, the higher the value placed by private and public administrators on the raw materials and consequently the more efficient will be methods of fire protection and cutting operations.

Truth is truth and sooner or later will out. As concerns the forest resources of Canada the earlier the truth is known and published broadcast, the lighter will be the handicap placed on the people of Canada in days to come. In the spreading of facts relating to the forest conditions of the Dominion, incidental disadvantages to private investments must be borne with what patience is possible.

Across the American border, the forestry problem at the present time is inviting the frankest discussion. The old-time inclination to hush any and all references to fire damage on private timber tracts has apparently

gone with a lot of other hobgoblins of pre-war days.

Who would have said five years ago that the Western United States timber owners would ask the government to introduce scientific control of cutting on their limits. And yet, here is what the "Timberman" of Portland, Ore., says in its most recent editorial:

"The lumbermen and the Forest Service should get together and work out some definite plan for perpetuation of the timber supply on some scientific and workable basis. The Government is interested primarily in the available supply of timber for the nation's use. Herein lies the marked distinction between governmental and private interests. The time for the lumberman to consider this question is now. There never was a more opportune time than the present for the lumbermen of the country to initiate a broad national movement looking to the assurance of the future timber supply."

And again:—

National Business

"The growing of timber is a national function. It is not the business of an individual.

"Another step in formulating a national forest policy would be the purchase of all timber lands belonging to private interests lying within the National Forests in the West.

"Then should follow the purchase of areas of timber land lying within a zone ten to twenty miles around the National Forests.

"With this as a basis there might be evolved a co-operative plan between the national Government and the private holders of timber lands whereby exchanges could be made of cut-over timber lands for cutting rights within the National Forests. The basis of exchange could be determined, in a measure, by the size of the tract, its location and adaptability for

reproduction. The condition in which the land was left after cutting would also be a factor in the exchange value. The land suitable for agriculture would be opened for settlement, the idea being to make every acre of land sustain either trees or people.

"The eyes of the nation as never before are focused on the lumbermen. There are no bigger, more broad-minded or patriotic men in any in-

dustry than are to be found in the lumber fraternity. Let us have the breadth of vision to go forward and give the country an example worthy of a mighty industry which seeks to maintain itself, not for its own sake alone, but for the country's as well. The lumber industry is the one of the few basic industries which has within itself the possibilities of perpetuation. Let us grasp them—NOW."

Forests of South May Last 25 Years

Charles S. Keith, president of the Southern Pine Association, recently made the statement before the Federal Trade Commission that the South is denuding its yellow pine forests at the rate of one and a half million acres annually, and further that not a foot of timber is being grown to replace that cut from the virgin forests. Mr. Keith based his principal contention for an advance in lumber prices on the South's rapid inroads on the nation's supply of timber. To the average lumberman, Mr. Keith's further unchallenged statement carries deep significance: **That within the next twenty-five years the South will become an insignificant factor in lumber production.** The high water mark he placed at 1911. Mr. Keith's utterances are deserving

of consideration in the formulation of a definite national policy to insure our future timber supply.

As Mr. Keith has so forcibly pointed out, the supply of timber in the South alone is diminishing at the rate of one and a half million acres a year, and reforestation is not even considered on private lands as an element in production.

Canada's White Pine

In view of the foregoing statement, it is pertinent for Canadians to inquire how long the white pine forests of Canada will last when they are called upon to take up the burden of the vanished Southern Pine? Could the entire white pine possessions of Canada last under such circumstances, five years?

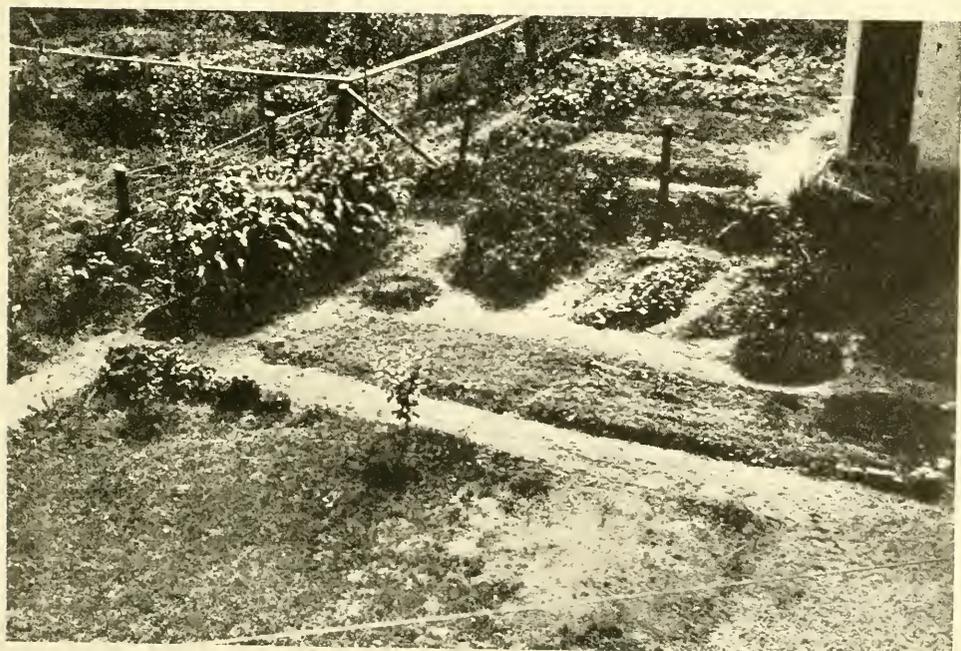
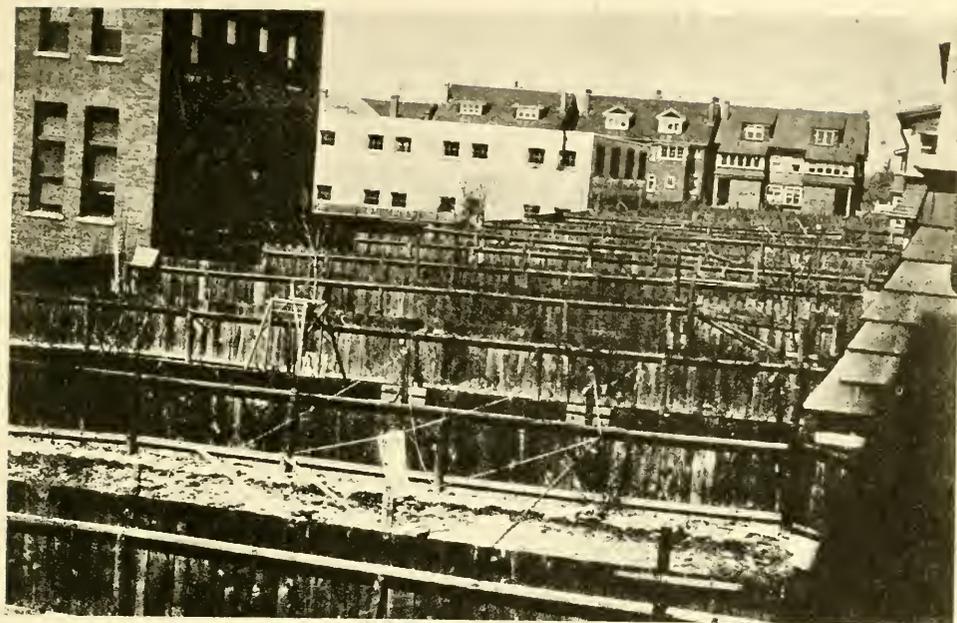
Wooden Fences and Yard Improvement

In the efforts towards improvement of back yard conditions in the City of Toronto, much emphasis is given to the riddance of unsightly back fences and the old-fashioned laneways. A member of the Forestry Association in submitting the accompanying photographs made the following comment:

"It is hardly necessary to draw attention to the fact that there is a very serious waste of lumber. Not only is there this waste of lumber, there is also a loss in productiveness, and a condition detrimental to the best sanitary state of affairs, and in addition there is a considerable loss

in community development. The smaller picture shows the junction of four back yards with wire fences. When shrubs and plants are in full bloom, the backs of these houses appear like one large garden and the neighbors vie with each other in their maintainance and productiveness.

"Can something be done to prevent the enormous waste of lumber in this way? Incidentally if open fences were adopted the fuel situation in many communities would be greatly relieved by the use of the old fences."



(See opposite page)

"Going It Blind" on Fuel Supply

People of Canada Faced with Certain Coal Shortage must Organize for Wood Reserve.

Canada is, in the main, "going it blind" on the wood fuel supply for next winter. Six months from the date of issue of this Journal will see the cold weather back again. How many municipalities have taken the U. S. Fuel Administrator at his word and have supplemented the inevitable coal shortage with fuel wood, is hard to ascertain, but judging by scores of reports in various local newspapers, amazingly little has been done. As in other campaigns the people have been waiting for leadership. They waited for it in February and March, the best months for getting the cutting done so as to allow time for seasoning. Scarcely a hint of the danger of delay appeared from any quarter save through the Commission of Conservation and the Canadian Forestry Association.

Now with winter five or six months distant, some effort in the direction of public education and warning appears. Advertisements are being circulated in the papers by the Ontario Government inviting municipalities to undertake to supply their wood fuel needs from the abundant supplies in Algonquin Park. The newly appointed Provincial Fuel Administrator, R. C. Harris of Toronto, has announced to some of the Boards of Trade that Canadians need not expect to have their houses at the same temperature as last winter nor to be able to secure a normal coal supply. Doubtless, provincial action will extend beyond a warning for very few municipalities will be found to take action of themselves if that is the limit of official co-operation.

Action Comes Late

Canadians may rest assured on one important point that we are six to eighteen months behind our United States neighbors in preparing for the coal shortage, which the U. S. Fuel Administrator says is certain to

arrive next winter.

Recent issues of the Forestry Journal have contained abundant information going to show the remarkable activity displayed by the Eastern States and the U. S. Government in supplementing the coal shortage with a wood reserve.

The Secretary of the Canadian Forestry Association recently spent a day in a small village, seventeen miles from Toronto. February had passed, March had passed and yet very few of the villagers and farmers had cut more than a few cords of wood, just sufficient to act as kindling for the anthracite coal fires they expect to enjoy next winter. At their back doors lay enough dead and dying hardwood trees to keep their homes at summer heat through five or six winters. In such communities across the border the State Fuel administrators tacitly informed the villagers and farmers that they need not expect their usual coal supply. This early warning, given six months or more ago, had the effect of driving every citizen into the nearest bush for a few days hard work.

A Grave Warning

What says the U. S. Fuel Controller, as reflected in the official statement of C. A. Macgrath, Fuel Controller for Canada?

1. That anthracite coal supplies to the points in Western Canada will be very materially restricted during the present coal year.

2. Under the circumstances, it is safe to predict that no American anthracite coal will be available for shipment to points west of Winnipeg.

3. It is also proposed to restrict shipments of anthracite to Canadian lake ports during the early part of the present season.

4. That the public, both east and west, must be given to understand that conservation of coal must be

practiced to the utmost extent by all classes of consumers.

Mr. Macgrath's memorandum said that Sir George Foster had been able to announce that the attitude of the United States fuel administration was that Canada would receive precisely the same treatment as the various states of the union. The western states had been given to understand that they must use the softer coal of the west and that the available anthracite would have to be conserved for the purpose of supplying the eastern part of the union and the provinces of Ontario and Quebec.

"Worse than Folly"

In the face of the unfounded public confidence, in next winter's developments, there is tonic effect in the recent call to action of Governor Bickett of North Carolina.

"It is worse than folly," said he, "for the people of North Carolina to depend on coal for fuel next winter. He who chops a tree in this cause serves his country no less than he who digs a trench. This is my appeal to the people of North Carolina."

This alarm is echoed by practically all the North Eastern States. Under the leadership of the United States Government the states have been organized for wood cutting purposes. Readers of the Forestry Journal who failed to read the article in the February issue on "How Uncle Sam attacked the Wood Fuel Problem," will be repaid in going back to the graphic story of Mr. Hawes.

Have Canadians any right to think that their super-confidence in an unknown factor is going to keep their homes warm next winter when Uncle Sam himself is making every effort to create an auxiliary supply of wood fuel?

It is only reasonable to suppose that if any persons are to freeze for lack of coal, it will not be the people of Massachusetts first and Canadians second.

Possibly the coal situation may work out nicely for both countries. But that is only an effervescent guess,

and will remain so until next winter actually arrives. Peat beds may be developed but not in time for 1919. Briquetting of lignite may be developed, but not for NEXT WINTER.

The only sure thing about NEXT winter is that it will bring many months of bitter cold, and that Central Canada cannot lay its hands on a single ton of hard coal, within its own boundaries.

Peat and lignite coal may serve Central Canada some day, but six months passes quickly and six months from to-day means another winter.

The Waste in Rural Parts

For the large town and city, hard coal will always be the staple fuel. But for the small town, the village, the cross roads and the farmstead, cordwood is certainly the logical safeguard. The United States Fuel Controller, while not issuing a specific mandate on the subject, has hinted plainly enough that those villages and farm homes surrounded by abundant hardwood supplies cannot expect coal to be diverted for their use next winter. The consequence is that local clubs, war fuel companies, school boy groups, etc., have been organized months ago to lay in a stock of cordwood and give it time to season.

To what costly extremes the people of Ontario may be forced six months from now is known to only too many citizens of Ottawa and other cities who were obliged to pay \$12 a cord for abominable examples of "wood fuel," consisting of green and rotted pine, mixed with green poplar, Ironwood, pieces of fence rail, old ties, and soft maple—a mixture almost impossible to burn without a previous immersion in gasoline. Such wood at such a price is at least equal to \$30 a cord for good hard seasoned maple, beech, elm, etc. However, another failure of the coal supply, coupled with a shortage of wood will bring thousands of householders to just such an experience.

The people are willing to accept advice. They are willing to act. They are keen to avoid a repetition of last winter's experience. All that is needed is rousing leadership.

A Model Municipal Wood Yard

Virginia, Minnesota, has established and successfully operated a model municipal wood yard. It has always been a problem to obtain anything but temporary and transient labor for city work because there was no form of employment which could be offered in the winter months. This possibility of using the city labor in the wood yard in the winter and thus creating a permanent employment for a better class of labor was a strong incentive to the city.

Once the idea had taken root they promptly proceeded to put it in operation in true business fashion. A considerable tract of birch and maple timber within three miles of the city was purchased at a stumpage cost of about fifteen cents a cord. An eighteen horse-power kerosene saw outfit was installed on this tract and enough six-cord racks, divided into two-cord compartments, to take care of all the delivery teams. In this way there was no delay in measuring the wood while the teams waited. The wood was measured up and waiting for the

teams at all times. The city teams were used for delivery. Ice roads and a down-hill grade to town made it possible to haul two full cords—the minimum delivered to any one address—at a load.

The office work was handled by a manager in the court house. The city papers advertised the fact that the city had wood for sale at \$3.00 per route for 16-inch wood, \$4.00 for 24-inch, \$5.00 for 32-inch, \$6.00 for 36-inch and \$8.00 for 48-inch. Full payment to be made in advance. The applicant filled in the order.

Both the citizens and the city have been greatly benefitted by the operation. They expect to do even a larger business next winter, and are so well pleased with the way the thing has worked out that they hope to make it a permanent institution.

Many other towns on the range have established city yards on one system or another, but none of the others are so well organized or so well operated as the one in Virginia.—From "The North Woods."

How to Save Coal

Many people believe that it is impossible to get cordwood into the cities at anything but fabulous prices and that no one would use it even if it were cheap. This is very largely a superstition that has been built up and carefully fostered by the coal men. A recent experiment tried in St. Anthony Park North, a part of St. Paul, shows pretty conclusively that both assumptions are poorly founded.

A community of about five hundred families was chosen as a basis of the experiment. The members of the Forestry Club of the University volunteered to distribute some order blanks as their bit in helping out the fuel shortage. A little later they collected the orders for one hundred and ten cords of tamarack wood, a species that the coal dealers claim cannot be sold at any price.

The wood was bought up North, shipped to the city in carload lots, sawed into 12, 16, and 24-inch lengths and delivered at \$9.00 per cord. A carload of oak was handled in the same way and sold at the same price.

If the same plan could be worked throughout the city, and every community of this size could be sold the same amount, and there is no reason why it could not be done, it would mean a sale of eleven thousand cords of wood in St. Paul alone. Ten thousand tons of coal saved for Uncle Sam.

—From "The North Woods"

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

The Fire Fighter's Profession

BY E. T. ALLEN

MANAGER, WESTERN FORESTRY AND CONSERVATION ASSOCIATION

The modern forest officer, whether ranger or firewarden, is accorded great respect and responsibility because of his highly trained and specialized public service. Few men except naval and aviation officers, who also must combine practical experience with technical knowledge and trained intelligence, are expected to be so proficient with hand and mind alike. Out of a service which a few years ago was not even skilled labor, and was assigned to any inhabitant of a forest region, has developed a profession of forest fire prevention which requires all the abilities of a thorough woodsman, knowledge of many engineering sciences, successful command of men, and a talent for law enforcement and enlisting public co-operation.

This new profession has been able to develop largely because improved organization of private and public fire forces has created both rivalry and co-operation among those with joint problems to solve. It has been stimulated by the very fascination to an active and inventive class of men of its ever-widening field, challenging them to devise new methods and equipment and to keep abreast of invention in other fields in order that such may be seized and adapted. Telephony, heliography, meteorology, aviation, topography, range-finding—these are but some of the sciences which have been made part of methods for detecting and controlling forest fires, to say nothing of the mechanical perfection of equipment and the systematizing of feeding, transporting and handling men under the most adverse circumstances. To educate the public into greater care with fire, new trails have been blazed into the fields of psychology and publicity. The technique of forest legislation and the processes of enforcement is an essential knowledge. Finally, there is the actual fighting of fire, never the same, defying all rules, profiting by all previous experience but calling always for new and decisive reasoning.

Ranger Specialists

The most rapid development of fire prevention knowledge will be obtained by the engaging of each officer in specialized study of the subjects which interest him most, and his contribution of the results to his colleagues at meetings and in reports. But the development of maximum efficiency in actual field application requires that every officer study the progress along all lines. As the successful surgeon or engineer keeps abreast of everything done in his profession, from time to time adding his bit, so does the successful forest officer. It is this spirit which advances the profession in value and public estimation, thereby insuring its support, and which increases the opportunity of each individual member to gain reputation and financial return.

Relation to Public

Much has been said of the proper relation of the forest officer to the public. As a rule greatest stress is laid on his personal relations. He is enjoined to be tactful and helpful; to educate his neighbors in the importance of forest protection to every citizen, to reduce fire hazard so as to have fewer fires to fight, to teach compliance with law so punishment will be unnecessary, to be popular in order to win voluntary co-operation. All of which is so well recognized nowadays as important that few if any forest officers need it repeated to them. None know it better than they do. Enough is seldom said, however, of the assistance in gaining such community influence which lies in making the job stand for the professional competence described in the foregoing pages.

People respect, and usually admire, a man who has authority because he understands a difficult subject. No matter how superior the passenger may

feel personally, he thoroughly respects the officer of the ship that carries him. He knows seamanship is as necessary as it is mysterious to him. The public is now fairly well educated in the importance of forest protection and, in time of hazard at least, it is appreciative of protective organization. But it is not sufficiently accustomed to regard the forest officer as master of a peculiar profession, who for this reason alone has been given grave responsibility for life and property. Just as he acquired greater dignity when he became the representative of a public or quasi-public organization of high public service than he had when merely the local employee of a timber owner, he has now acquired an immeasurably higher dignity with the exactions in this service for training and knowledge beyond that of other men. It is this standing, above all, which the forest officer should have in the community.

To gain it, he must take keen pride and interest in all the technic details of his profession and see that its progressiveness is realized by the public. The type of officer who will do these things is the one that will prevail.

The New State-Sense and Conservation

"We have in general left behind us the days of crude plenty, but have not adjusted our ideas nor our habits to correspond with new economic conditions. Here the need is intellectual and moral education,—a

better vision and more altruism. We need a keener social consciousness and a new state-sense, if we are ever to solve the problems of conservation."—*Foundations of National Prosperity.*

From the Log Book of a Lecturer

The welcome accorded to lecturers sent out by the Canadian Forestry Association may be gauged by reading the following excerpts from a letter by Mr. A. H. Beaubien, who has had remarkable success in Western Quebec, where he has given illustrated addresses on forest protection in the back settlements.

"I got to Ferme Neuve after a 12-mile drive through pouring rain," reports Mr. Beaubien, "and was much elated when I faced a hall packed to the doors with very eager people. There were over 200 present.

"On Wednesday, Mr. Mullin, the Chief Fire Ranger, arrived at Ferme Neuve, and took me to Ste. Anne du Lac. We made the 18 miles under pouring rain again and arrived at seven o'clock p.m. The school house was filled with over 100 people which is practically the whole male population. Ste. Anne du Lac is just a little clearance on the shores of Lake Tapanec and it was inspiring to see these brave people coming through the woods with their lanterns, or

paddling down the lake toward the village.

"On the morning of the next day we started on a 32 mile tramp to Mont Laurier and had not been going long when our buggy gave way. Luckily the fire ranger was at hand and repaired our rig but we had to walk for four miles because it was all that the horse could do to pull himself and the buggy. We got to Mont Laurier at 7 p.m. I hunted up the moving picture operator and hurried to the hall. We had a full house. M'gr Brunet, the Bishop was present with seven or eight of his priests and the main hall and gallery were packed. I reckon that over four hundred people were present. After the lecture, congratulations were offered to the Canadian Forestry Association by M'gr Brunet Dr. Cartier and some other prominent gentlemen for the good work being done."

These are the first educational meetings along forest protection lines ever held in the Quebec settlements.



SHINGLE CREEK, OKANAGAN VALLEY, B.C.

showing Yellow Pine type on slopes. This forest has sustained several fires and the hill is slightly eroded. There is little undergrowth and fair grazing.

The Menace To Our White Pine

BY PROF. J. H. FAULL, PH. D., UNIVERSITY OF TORONTO

Canada's Greatest Timber Tree Rapidly Losing Its Rank. Blister Disease Makes Headway.

White pine is the basic tree on which the forest wealth of Canada, east of the Great Plains and of the North Eastern States, has rested: it has been the source of the success and the fortunes of our great lumber companies, it has contributed largely to the revenues of our government—in Ontario to such an extent as to free us so far from direct taxation—and it has brought comfort to the home of every citizen, for it has been used inside and out as has no other in the building and furnishing of the dwelling and its surroundings, in which the home resides.

"This is the forest primeval. The murmuring pines and the hemlocks,"

so Longfellow pictured the Acadian forests of Evangeline's people. With the hemlock we are not concerned here, but what of the pine? That primeval forest of the Annapolis Basin with its closely-spaced "murmuring pines," the plumed crowns waving a hundred feet or more above the darkened floor, and the clean straight shafts three to four or five feet in diameter, stretching up sixty to seventy feet without a break was but a small corner of the glorious primeval forest of pine that covered the maritime Provinces, Quebec and Ontario south of the Height of Land, Minnesota, Wisconsin, Michigan, Ohio, New York, Maine and the

other New England States, Pennsylvania and the mountains well on down into the Carolinas. From the first coming of the Europeans it has been menaced and in many ways:

1. Vast areas were cleared for agricultural purposes; most of these areas will always be devoted to food production, but we now realize that lands of no inconsiderable proportion are unsuited for such purposes and that the removal of the forest was a mistake, and so we discover in the majority of cases the reason for the abandoned farms and fields to be found in all parts of the white pine area, and not alone in New England and the Trent watershed of Ontario; the problem of reforesting these sections has been confronting us for many years and is now more acute than ever.

2. Prodigality on the part of the early settlers and of their descendants. They and we have looked upon our pine as on our wild game and other natural wealth, as something that could be destroyed, often without rhyme or reason, often for very temporary gain, without regard to the future—happily we are coming to a more reasoning attitude, but necessity may be given some credit for that.

3. Unscientific methods of lumbering, which includes waste—often criminal in extent, disregard of provision for the natural restoration of the forest and failure to dispose of the slash, leaving it as the almost certain starting point of fires and as a nursery for various destructive fungi.

The Toll of Fire

4. Fire has been from the first and still continues to be much to our shame and our countless loss—the agent most destructive of our pine and other forest wealth. It has been and continues to be a veritable demon of destruction in spite of the fact that it could be largely controlled. It is said that “through fire waste alone more timber had been destroyed in the Dominion than had been felled by the woods-

man’s axe for ordinary commercial purposes.” “This is nothing short of appalling when we take into account the fact that the primary forest products of the country have a value of approximately \$175,000,000 annually, and the output is being imperiled through a waste that is largely preventable.” In this connection Senator Edwards has declared that “it will be only a few years when lumbering will be so reduced that, excepting west of the Rocky Mountains, it will be a very small industry indeed in Canada.” It is also affirmed that “white pine, which was long the leading commercial tree of Canadian forests, is supplying less lumber than it did five years ago by over forty per cent., while its proportion to the total cut of all kinds is only about one-fifth.”

Timber-destroying Fungi.

5. These have always been at work but never so destructively, proportionately at least, as now, for the stronger trees have been removed, slash has accumulated, and fire has made open scars which make their access sure and easy. With the diminished stock left, the losses from this source become constantly more significant. If anyone doubts this statement he has but to examine any run of logs and note the number that are defective. Little attention has been paid to this matter because there have been enough good trees to supply the demand: but this factor must receive attention, for the effect of removing the strong and healthy from the forest, leaving the weakened members is certain to produce much the same effect in the forest as in human society.

The Blister Rust of the Pine

6. The blister rust is a new comer from Europe and a very real menace—one that may render nugatory our efforts at reforestation with white pine, one that may spread with disastrous results to some of our most highly-valued western pines and one that may in time render futile the efforts we are making to preserve our white pine from des-

truction by fire, unless it can be eradicated or held in check.

This disease is caused by a fungus. The fungus attacks the living bark, causing death by girdling. All 5-needled pines are susceptible, all other kinds so far as is known are immune. The disease continues from year to year in an infected tree, but cannot spread from one tree to another. The fungus also causes a leaf disease of *Ribes* (currants and gooseberries). All species of *Ribes* are susceptible, but some, such as the cultivated black, and the red currants, more so than others. The disease spreads rapidly from *Ribes* to *Ribes* by means of spores, wind or animal-borne, but with the falling of the leaves at the end of the season, the affected plants are free from it and can be infected again only from rusted pines. It also spreads by spores from *Ribes* to 5-needled pines, and this is the vital feature with respect to the disease on the pine. This relationship was discovered in 1892. The dependence of the fungus on these two hosts is so complete, that without both its existence is impossible. Observations and tests so far made have shown that under natural conditions there is probably little likelihood of the disease passing from one host to another if they are separated by a distance of one-third of a mile.

Origin in Siberia

The history of this disease is both interesting and instructive. Its home is in Siberia and the Ural Mts., and its natural host is the stone pine of Europe and Siberia—*Pinus cembra*. Two hundred years ago our white pine was introduced into Europe and planted there extensively, for ornamental purposes and in some cases as a commercial forest proposition. About fifty years ago it was observed that the rust on *Pinus cembra* had spread westward and had attacked the imported white pines, and that, as so often happens, it was more virulent on the new host than on its own natural host. Now follows the story of its intro-

duction into the western hemisphere. A little more than 15 years ago a planting movement gained great impetus in America, and the cry was—"Plant white pine." The American nurseries were unable to supply the sudden demand for pine seedlings, and because of the greater cost of production made no effort to compete with the established European nurserymen. The result was that vast quantities were imported from Europe and with little or no question as to the health of the stock. Up to 1909 nearly 5,000,000 seedlings had been imported, about 95% of this from Germany, and distributed to hundreds of localities in the U.S. and Ontario. In 1909 it was discovered that large numbers of the shipments of that year were diseased. Then the door was closed. Examination proved that the 1908 shipments had been bad, too, and there is good reason to believe that diseased stock reached our shores even earlier than 1908. The suspected plantations that could be located were destroyed, but the records did not reveal the whereabouts of all of them, so that we have waited with fear and trembling, though with some hope that the danger had been averted. Three years ago, however, the blow fell, and reports from Ontario and a dozen states announced more or less serious outbreaks. Consternation has reigned, but state, provincial and federal governments have lost no time in determining the extent of the affected areas and in attempting some control or eradication measures. Massachusetts, New York and southern Ontario are known to be especially hard hit. As yet our great northern pine forests are scarcely reached; but it is unescapable that they are in imminent danger of widespread infection.

Infections have been reported from: Ontario and Quebec; Maine, New Hampshire, Vermont, Massachusetts, Connecticut, Rhode Island, New York, New Jersey, Pennsylvania, Ohio, Indiana, Michigan, Wisconsin, Minnesota, and South Dakota.

To be Concluded in June Issue

Firmer Handling of Crown Forests

During the passage of the two Bills in the New Brunswick Legislature creating a Forest Service, the personnel of which will be under control of a non-political Board, Hon. E. A. Smith, Minister of Lands and Mines made some interesting explanations of the problems which the forest administration of the province has been called upon to solve.

"The tremendous rise in the price of pulpwood has given an impetus far beyond anything ever experienced before in this province, to the cutting of this wood. As a natural sequence trespassing is a common occurrence requiring great vigilance on the part of the scalers in reporting these trespassers, who are now required to pay a penalty stumpage of \$3.75 per cord or in superficial feet \$7.50 per thousand. One of the hard problems I found in taking over the administration of affairs in this office was to know how to deal fairly with the settler on Crown lands in disposing of the pulpwood he cuts in making his clearing.

"If it were a matter dealing with bona fide settlers, then the problem would be a simple one, but where the records of the department show that a very large proportion do not fulfill the requirements of the settling act, it will be seen at once the question of dealing out justice is approached with a great deal of difficulty. Accordingly I gave orders that all green pulpwood cut outside of the first ten acres be subject to a stumpage of \$3.75 per cord, burnt wood \$1 per cord and payment be exacted by the department. When it is shown that the settler has complied in every way in homesteading his lot, then 75 per cent. of the stumpage collected will be returned to him.

Get Clear of Politics

"My proposal for this new Crown land policy is to remove the administration of the forests to a very large extent, if not altogether, from the sphere of politics. It is proposed

to combine the following services, viz.: Protection of forests from fires; scaling of lumber cut on Crown lands, and protection of game, with one efficient staff the chief officer of which will be the director of forest surveys under a board consisting of the Minister, the Deputy Minister, the Director of the Forest Branch and two others, one representing the leaseholders and one representing the owners of Crown granted timber lands.

The board will have authority to appoint the necessary staff to carry out these duties and the men employed to possess the necessary qualification after examination.

A new up-to-date fire service to be inaugurated to include the organization of sufficient competent men to cope with forest fires in all parts of the province, whether on Crown or granted lands; building telephone lines in the forest; erection of lookout stations; cutting fire trails; necessary tools for fighting fires; gasoline engines for railway work; in short, everything that experience has taught is necessary in the prevention of the great fire evil.

More Money for Treasury

On the first of August, 1918, the licenses which were sold in the year 1893 and not renewed under the legislation passed in the year 1913 will expire. There was strong influence brought to bear that we shall allow the licensees to pay the bonus and interest, an amount that would equalize the payments made by those who renewed their licenses under the legislation referred to, but the government thought it would be more advantageous to the province to allow these lands to go up for sale.

In these days of high stumpage values it was our opinion the tariff rates existing when we came into office were not in keeping with those charged by owners of private lands, accordingly we raised the rates on spruce from \$1.50 to \$2.50 per thousand, other lumber in proportion. The increased rate has been well received, so far as can be ascertained, by the licensees. The renewal rate of \$8 a square mile annually has been left the same.

During the year arrangements have been made for the placing of five parties in the field, whereas last year there were but three. These parties completed the survey and inspection, under forestry methods, of 925,000 acres, which is now being tabulated and mapped in this department. The total area surveyed so far amounts to 1,245,000 acres, or 16½ per cent. of the Crown lands. While the cost of labor and supplies has increased from last year the cost per acre of the survey makes a very favorable showing. The figures are as follows: 1916, \$27.20 per square mile; 1917, \$27.07 per square mile. The total amount expended since the inception of the survey is \$44,574.57.

There has also been introduced in the New Brunswick Legislature, important measures with the object of giving greater protection to the forests of the province and to stop the wastage which has been going on for years. In speaking of the proposed new Acts Hon. Mr. Smith said in part:—

Stop Deterioration

The most casual observer could note that the forests are failing. It would take only a visit to the rivers or mill ponds to see the change that had taken place within a comparatively short time, in the size and quality of the saw logs. Fir, which a few years ago was left standing in the forest, had come to a compromise thirty or forty per cent. of the operations. This was prima facie evidence that the spruce was being depleted rapidly. In the early days of New Brunswick, white pine formed the most valuable part of the forest,

and huge quantities of that timber were exported to Great Britain. White pine failed to reproduce to any extent and little remains in the province at the present time. Later spruce was in demand. Large mills and scores of portable mills were operated to meet the demand for spruce and in consequence of the indifference and the wasteful methods of the jobbers, spruce fast was going the way of the pine.

Scalers' returns from 1910 to 1917 inclusive give a total cut of 2,228,337,215 feet, an average cut of 275,500,000 feet per year. This would indicate that the present assumed commercial softwood stand is about eighteen times the average cut of the last eight years. This did not mean that the softwood would be exhausted in eighteen years, because the annual growth was applied against the annual cut.

An annual growth could be expected on the greater portion of the timber estimate given before, and also on under size spruce and fir, which would be in the vicinity of 5,000,000,000 feet. Some of the under-sized timber would reach commercial size in eighteen years. The average annual growth would apply to not more than five million acres.

Supervise Scaling

The outlook for a large return for the present logging season was not promising. From the information at hand the cut would not be more than fifty per cent. as compared with last year. One of the first questions that the government had taken up was the unsatisfactory method of obtaining a true account of the lumber cut on Crown lands.

The general principle, he said, was to pay the scaler a flat rate of seven and one-half cents per thousand on the logs he scaled, this presumably being thought an incentive to the scaler to get as large a count as possible to remunerate him for his activity. However well this may look in principle, in practice it is not borne out.

We have therefore decided to commence building up an outside service

by utilizing to some extent the forest engineers, and gradually eliminating the objectionable features of the present system.

During the short time I have been in office, I am convinced the present methods of scaling are antiquated and very often not much more than a guess, said the speaker.

Having been convinced of the difficulties of lumbermen in estimating the size of the tree to be cut in accordance with the regulations, I have seen fit to change this regulation by providing the simple requirement of a stump diameter, viz., 12 inches for spruce and 9 inches for fir inside of bark, said the Minister.

Early in the season I sent a circular letter to every operator on Crown lands under the authority of legislation passed at the last session, asking for the cut on both granted and Crown lands. The responses from the lumbermen, to a very large extent, were unsatisfactory. As the law was enacted after the operations were completed last season, I have concluded, however, unwillingly, not to press the matter too strongly against the lumbermen in this connection, but should proper returns not be forthcoming during the present season the law will have to be invoked and the penalties claimed as provided by the timber regulations."

New Brunswick Forest Club

The second annual meeting of the New Brunswick Forest Club, Ltd., was held at the University of New Brunswick on Friday, April 12th, at 8 p. m., and the following officers were elected for the ensuing year.

President—W. B. Snowball, President of J. B. Snowball Co., Ltd., Chatham.

Vice-President—R. B. Miller, Dean of N. B. Forest School.

Secretary-Treasurer—L. S. Webb, Forester N. B. Forest Service.

Executive Committee—R. R. Bradley, Consulting Forester New Brunswick Railway Co. and J. R. Gareau, Forester J. B. Snowball Co., Ltd.

Hon. Dr. E. A. Smith, Minister of Lands & Mines was unanimously elected a life member of the Club, in view of his great interest in Forestry work and importance of the work being carried on under his administration.

Other new members elected were—Mr. J. W. Gill of Barnaby River, Mr. J. W. Maloney of Rogersville, Prof. R. P. Gorham of the Provincial Normal School, Mr. Donald Fraser and Mr. Archibald Fraser of the Fraser Companies, Ltd., Mr. A. T. Murchie, Inspector of Scalers, Mr. L. A. Gagnon, Chief Game Warden, L. P. Roy, Campbellton, F. A. Barkhouse, J. G. B.

Pugh, J. D. McKay and E. R. Rutledge of the New Brunswick Forest Service, Geo. F. Burden, Assistant Inspector of Scalers.

An instructive paper prepared by Donald Fraser of the Fraser Companies, Ltd., dealing with the administration of forest lands was read by G. H. Prince, Mr. Fraser being unable to be present.

Prof. R. B. Miller gave a very interesting address on the utilization of by-products from sawmills.

Mr. J. R. Gareau led in a very practical discussion on the methods employed and the possibility of eliminating the unnecessary waste in logging operations.

A number of important resolutions dealing with the administration and protection of forest lands were prepared for transmission to the Government of New Brunswick.

WANTED!

Accountant—A first-class opportunity for the right man is open in the Logging Department of a large paper company for an accountant. He must write and read both languages. One who has had previous experience in this line of work is preferred. Box NY, Canadian Forestry Journal, 206 Booth Bldg., Ottawa.

Forestry and the War

BY DR. B. E. FERNOW

Dean, Faculty of Forestry, University of Toronto

Has the Public Opinion Yet Been Convinced That Forest Maintenance Is State Business ?

The relations of the war to forests and forestry are many; they can be discussed from a variety of points of view. There is a rôle which forests are playing in military evolutions—the consumption of materials for war uses, the destruction of forests in the war zone, the disturbance of regulated forest management where such existed, etc.

It is not my purpose to exhaust the theme, but to direct attention particularly to what I consider the most important and possibly most lasting effect, namely, upon the development of future forest policies in our country. I shall only briefly touch on other relationships.

The war has taught us, in the first place, new appreciation of the value of forests and forest products. We have been made aware of the fact that, as in olden times, forests play a not unimportant rôle in modern military tactics—important enough to pay particular attention to the maintenance of boundary forests as a matter of State policy. Indeed, the aeroplane development as a most efficient reconnoitering means imparts a particular, additional value to forest cover as a screen against observers.

Next, we have found that in modern warfare, forest products are needed in large quantities, and that home supplies are preferable to importations, not only because of the possible inability of securing such, but on account of transportation difficulties.

The average trench requires alone about one cubic foot of wood to 10 feet of trench—say, 60,000 feet, board measure, to the mile, or 15 billion to the French front, not to account for shelters, artillery screens, block-houses, etc., and fuel. Such structures consume on the French front

as much as \$500 to \$1,200 worth of wood apiece.

Again, forest industries which were on the decline or entirely abandoned have been revived by the war and new uses for wood products developed.

In Germany, cut off from the outside world, the long-abandoned naval-stores industry, based largely on spruce, and the tan-bark industry, based on oak coppice, have been revived, while in France the need of pine timber has made serious inroads in the turpentine woods of the Landes.

Wooden ships and aeroplanes call for special materials. The substitution of wood cellulose for cotton in the manufacture of explosives and the use of sawdust for cattle feed are among the new uses.

Moreover, we have learned to appreciate that certain classes of forest products are rare and of special value. Sitka spruce, once a despised material, is now found almost indispensable for aeroplane construction, furnishing long, clear, light, yet strong, material. The limited supply of such material suggests the propriety of Government control.

French Forests Destroyed

One of the first thoughts which the theme suggests leads us to the battle-fields in Flanders, where a wholesale destruction of forest cover has desolated the country. While the territory occupied by the enemy represents only a small fraction of the whole of France, it includes a proportionally large part of the French forest area; perhaps one-fifth to one-fourth of the total forest area—the most extensive and richest portion of French forests—is located in the war zone and much of it destroyed—a sad loss, which it will take many years to

repair. It is mostly privately owned, but private endeavor by the impoverished owners will prove entirely inadequate to undertake the work of restoration. There is little doubt that State aid will be needed.

Not only outside the war zone in France, but in Great Britain, the woodsman's ax has been busy cutting available supplies for war purposes. That in this cutting Canadian and American lumberjacks have been largely employed may be assumed to have made for efficiency in operation, but it may also have been secured at the expense of all silvicultural considerations. Many a forest managed under a natural regeneration system will have been cut without regard to the needs of reproduction, and French foresters will for many years to come find difficulties in returning to a sustained-yield management, which has been deranged by premature harvests.

The magnificent fir forests of the Vosges and Jura Mountains, the show pieces of French foresters, managed in selection forest, are being dismantled without regard to reproduction and with the maximum of damage to young growth.

Effect in Britain

In Great Britain the utilization of home-grown timber on a large scale will have waked up the people to the possibilities of increasing its production, and we may confidently expect a more serious effort on the part of the Government to inaugurate a forest policy which will encourage private endeavor to replace the cut plantations and for the Government to attempt the ambitious pre-war schemes of wholesale afforestation of waste lands.

The British Empire Resources Development Committee bids fair to outlast the war and become a part of the Reconstruction Committee, which has begun its work.

While in our country these more or less direct war influences are not felt to a great degree, yet there is one development which has no direct bearing on forests and forestry, but promises to be of the highest importance in

the development of forest policies; it is the development of socialistic tendencies.

Nationalizing Industry

We are learning rapidly that government is a tool which can be made efficient, and we are learning to realize community interests as superior to individual interests. The extension of government functions has grown marvelously in all belligerent countries, so that Bellamy's description of the communistic state is not any more so Utopian as it was when first published, forty years ago.

The States that have gone perhaps farthest in nationalizing industries are the Australians.

In New South Wales not only are railroads and coal mines operated by Government, but woolen mills, cement, and even harness factories.

West Australia adds brickyards and quarries, sawmills and steamships, hotels and laundries, agricultural implements, and now even retail bakeries, butcher shops, and fish markets. The Ontario Government has undertaken at least the last enterprise, namely, to furnish fish at reasonable prices.

Under the influence of the Farmers' Nonpartisan League, the North Dakota legislature has gone so far as to declare for the principle that the State may enter upon any manufacturing or industrial field, and has taken up first State ownership of flour mills and grain elevators.

These socialistic developments have not altogether been merely dictated by war needs, but are bona fide changes of attitude toward private enterprise. We may, to be sure, not claim so much for the many Government activities which the belligerent countries, including the United States, have developed as war measures.

Congress itself has become more and more an exponent of Government ownership and control, with a tendency to State socialism. As Mr. Mann declares: "We are undergoing the greatest revolution in government which this country has ever seen."

After the war, to be sure, a formidable reaction may set in and we may

experience a return to unregulated industry and to the wasteful competitive system, at least in part. But while this reaction may take place in directions of temporary character, there are other directions in which Government control will have shown itself so superior as to suggest its continuation. May we not expect that if these activities are successfully carried on there will be arguments developed for carrying on at least *some* of them beyond the war?

The control of public utilities has been under discussion long before the war, and now we shall gain experience as to how efficiently the Government can manage enterprises such as railroads, shipping, munition work, mines, not to mention the food control and control of profits.

Before the war it would have been by most statesmen considered Utopian to undertake to regulate, as we do now, production, distribution, and even consumption. Now, we attempt all these things, cutting out competition as a factor in regulating prices and substituting a co-operative system. Are we bound to return to the wasteful system of competition? Or shall we have learned that, at least as far as the natural resources that are exhaustible are concerned, communal management is the only rational method.

There is no doubt that the war and its incidental requirements have forced us into abandoning at least temporarily long-cherished theories of individual *versus* communal functions: and the opportunity for making the change permanent, for making radical changes in industrial and economic conditions after the war, will never be better, provided the opportunity is seized immediately and the pendulum is not allowed to swing back too far.

Will Competition Lessen?

For many of the Government activities which the war has developed convincing arguments can be brought forward in favor of abandoning them to more or less unrestricted private enterprise after the exigencies of the war, which called them into existence,

have ceased: but we may assume that the general attitude favorable to an extension of Government functions will remain and the *public* interest will more than heretofore be considered in the new adjustments.

Can we not make use of this attitude in furthering the public interests in our own special business—the conservative use and management of our forest resources? Is it not timely to point out that, if anywhere, in the handling of these resources communal interest is paramount and calls for Government control?

The arguments for such State control are familiar to you. They may be summed up in one sentence, namely, that forestry—the management of forests for continued production—is not attractive business for private enterprise for various reasons.

At any rate, the idea of using our forest resources so as to produce continuous wood crops has so far gained little acceptance in America—none at all among the holders of the bulk of our remaining standing timber. Indeed, we may agree with Coolidge's statement, that "individual ownership has proved eminently uneconomical, and even destructive of the permanent productivity" of their lands. He does not, however, draw the proper conclusion when declaring that "there is no economic necessity for State production of timber."

Nor do we agree with Professor Toumey, who also pins his hope on private ownership, although admitting that "it is far more important to the *nation* that the second growth be adequately safeguarded than it is to the individual."

Profits too Far Distant

He proposes "by liberal tax laws and technical assistance to help the private owner to attain a protected reproduction, etc."

We, on the other hand, do not believe that there can be enough incentive created by these means for private forestry.

In vain have we striven for decades to interest the lumberman and timberland owner in a more conservative

treatment of his property with a view to a future, to substituting silvicultural management for exploitation. Outside of protection against destruc-

tion of their property from fire, we have practically secured no response, and that naturally, for such management is financially not attractive.

The Balance of Present and Future Needs

Private interest in any industry can only be a financial one, but financially forestry—a sustained-yield management—means curtailing present revenue or making present expenditures for the sake of a future revenue, and that in a distant future which is of no interest to the individual.

This time element, which is peculiar to our business, is a natural deterrent to private enterprise in this field, for self-interest works only for the present. Only a long-lived, stable, permanent ownership can assure us of conservative management; only State ownership can afford to exercise providential functions, can guard the interest of a distant future and wait a century for returns on its outlays.

That in some localities the forest cover, in addition to the mere material function, exercises a protective function on waterflow, soil, and climate, affecting local as well as distant interests—this protective function only adds argument for State control.

Is Regulation Possible?

I repeat, we have tried persuasive and promotive methods to induce private enterprise to engage in forestry, but the inherent troubles which surround this business have rendered the result negligible. We might apply methods of control and supervision over the use of private property which might insure continuity of supplies. Experience in the old countries has shown that, in spite of much more perfect machinery for enforcing laws, and in spite of much more ready disposition to submit to laws, the attempts to control private management have been largely without the desired result.

We may come as well now as ever to the realization that forestry is and must become State business.

—From "*Foundations of National Prosperity.*"

\$8 AN ACRE. YOUNG GROWTH

The question of the value of young growth in dollars and cents often occurs in discussions of Canadian foresters. The United States Forest Service has placed a value of \$8.00 an acre on young coniferous growth sixteen years old on the Columbia National Forest in Washington.

LUMBER IN THE MOVIES

Two carloads of lumber a day, approximately 15 million feet a year, are used by the studios of the Famous Players-Lasky Corporation at Hollywood, Cal., in the construction of "sets" and scenery for producing motion pictures which appear to the public as "Paramount" and "Art-craft" releases.

The time was when the canvas wall and painted window satisfied the film-going public. Now nothing less is sufficient than a wooden wall finished in fine grain papered or hung with heavy drapes; practical windows of real glass; doors that slam and lock. Everything is built substantially.

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

A Survey of Sugar Groves

BY G. C. PICHE, CHIEF OF FOREST SERVICE, QUEBEC

A survey of maple sugar groves in various parts of the province was begun last fall by the Forestry Branch. The object of this survey is to gather accurate data on the following:

1. The proportion of the various species of trees in each grove, to determine the influence, if any, of a mixture of trees on the yield of the sap, etc., etc.
2. The influence of the soil.
3. The influence of the topography of the ground.
4. The temperature.

Notes are also made on the equipment available, the methods of tapping the trees, of gathering the sap and also on the yield of sap, by species of maples, by a number of trees, and as influenced by the frost.

Information is also being gathered on the methods of making syrup and sugar, and, finally, a statement showing the profits or losses of the industry will be made up.

All reports will be compiled at the Forestry Branch by counties and by districts; thus before long complete and careful statistics concerning this valuable industry will be available.

Sugar now sells at a high price. It is, therefore, in the interest of our farmers to work their sugar groves so as to secure their own supply of sugar and syrup.

All the owners of sugar groves desiring to help in the survey are invited to write to the chief of the Forestry Branch, Quebec, who will be glad to receive any information that can be given.

B. C. Gets Forest Products Laboratories

Efforts which have quietly been exerted for several months past, looking to the establishment in Vancouver of a branch of the Forest Products Laboratories of Canada, are now certain of success. The new laboratory will be equipped at the outset with all necessary machinery and appliances for the carrying out of wood testing experiments on the lines pursued at the parent laboratory maintained by the Dominion Forestry Branch at McGill University, Montreal, where invaluable work has been carried on. Scientific demonstrations in tree chemistry were initiated in 1913, the wood-testing department being added in 1914. It is proper to mention here that the setting up of the Forest Products Laboratories by the Canadian Government was due to recognition of the great work done for the lumber and pulp industries at the United States Laboratories at Madison, Wis., established six or seven years ago.

This institution really represents the joining up of a number of wood-testing stations built up in various parts of the United States years earlier by Dr. Fernow, who at that time held the position of chief forester to the United States Government.

The result of the many requests reaching the Dominion authorities from the coast—the more especially since the starting of the spruce production campaign by the aeronautical branch of the Imperial Munitions Board—was seen in the arrival at Vancouver late in March of W. B. Campbell, B.Sc., assistant superintendent of the Montreal Laboratories, with instructions to communicate with the B. C. Forest Branch, the Munition Board, B. C. University heads, and leading lumbermen, with a view to the speedy establishment here of a wood-testing unit which doubtless will, after the war, form the nucleus of a much larger scheme to be carried out in behalf

of a better utilization of British Columbia woods. Conferences held with the bodies mentioned disclosed a hearty desire on the part of all to co-operate in every way possible with the Ottawa Government so as to secure the needed facilities with the least possible delay. As a result, Mr. Campbell was able to return east on April 15 with a draft of a comprehensive scheme for approval by the Director of Forestry at Ottawa which will permit of certain wood-testing data being available by the end of May, by which time it is expected the new building being erected by the British Columbia Government at the University for laboratory purposes will be ready for occupation and at least partially equipped.

B. C. A Great Gainer

On the evening of April 5, Mr. Campbell was the guest of the B. C. Forestry Club, when about 40 lumbermen and others were present.

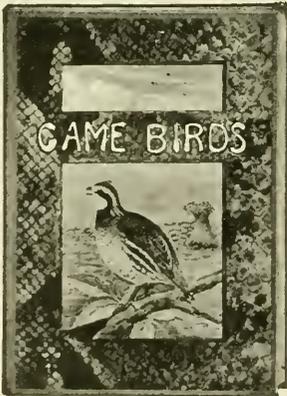
"In British Columbia," said Mr.

Campbell, "the study of timber is by far the most important work that the new laboratory can take up at this time. One of the prime factors is the study of strength in its various phases—strength in bending, strength as regards shock, resistance, hardness, tension stiffness, etc. The suitability of timber for any particular purpose cannot be judged by its characteristics as shown by any of these factors separately—they must be taken in combination. For instance, Douglas fir is one of the strongest of woods for its weight that we have, yet for aeroplane construction it is not as suitable as the much weaker wood—spruce. The first series of tests are necessarily on the pure wood—i.e., the characteristically straight-grained pieces. Without the knowledge to be derived from such tests it is impossible to proceed with tests of larger-sized material containing knots, checks, and other defects. At Montreal we have completed a study of the characteristic strength of the clear, straight-grained material of

How many North American Game Birds Can You Name?

Can You describe twenty-one kinds of ducks—six kinds of geese?

If not, there is a good time awaiting you in a copy of "Game Birds." and by a piece of good luck the price is just 50 cts. post free.



A splendid little book of 64 pages, 5 x 7 inches, made up of heavy coated paper throughout.

Forty-nine of the best illustrations in life-like natural colors you ever saw—really a beautiful piece of quadri-color printing. Decorated board covers.

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

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

FIFTY CENTS A COPY, POST FREE.

(STAMPS OR MONEY ORDER)

CANADIAN FORESTRY JOURNAL

206-207 Booth Building, Ottawa.

Douglas fir, so that we have progressed that far on the road to an exact knowledge of this species. Another thing that will be very important out here in the future is built-up stock, including three and five-ply veneers and bigger stuff. The possibilities for British Columbia manufacturers along this line are tremendous. The work of the Forest Products Laboratories in the East has been very heartily endorsed by the pulp and paper manufacturers, who have manifested their appreciation by offering substantial aid. One great benefit that is certain to follow from the establishment of a wood-testing branch in British Columbia will be that architects and engineers will have definite data concerning the properties of British Columbia woods which they will be able to use when designing structures, in the same way they now have knowledge of the definite properties of steel, concrete, and other standard building materials. This information will be especially valuable also in the export trade when it is a matter of introducing a new wood in competition with some that have been long in use. An instance of this is shown in the advantage which long-leaf pine has over Douglas fir on account of the scientific grading and the branding of all grades by the mills. Constructors are enabled to select the class of material which exactly suits their needs, without the necessity of buying high-grade material for purposes which would be equally well served by lower quality timbers or lumber. Per contra, they also are able to avoid the danger involved in buying low-grade material where high grade is necessary.

Aeroplane Work First.

The laboratory to be established at Vancouver will at first be limited in its work almost entirely to problems arising out of the production of aeroplane material. Owing to the lack of special knowledge of British Columbia woods and the influence of defects, it is necessary for the Minister of Munitions to de-

mand very high standards of quality in the material reaching them. If an increasing understanding of the properties of the woods required will allow of even a very slight relaxation of the specifications, a very great increase can be made in the amount of material available. It is just possible that further investigation may disclose that the province has other woods which might be used to advantage in aeroplane construction.

B. C. FIRE DOES DAMAGE.

Forest fires which swept for three and a half miles along the Columbia river, between Sullivan and Genelle, burned 37 high power line poles of the West Kootenay Power and Light company Sunday and yesterday and temporarily interfered with operations at Trail smelter. But for the fact that one line was preserved the whole plant would have had to close down.

Forest rangers were quickly on the job and the fire last night was under control.

Men from J. S. Deschamps' lumber camps and the West Kootenay Power and Light company cooperated with the forestry officials in fighting the blaze, which burned furiously at times. At one point it jumped about 900 feet across the Columbia river.

It is believed that sparks from a locomotive started the fire. In the same district five or six fires were started during the past two or three days by clearing fires getting away from the ranchers who were burning brush.

Moving a Paper Mill.

A paper mill looks as if nothing could move it.

But a paper mill can be moved by a few careless men miles back in the forest. How?

Burn down the limits and the mill disappears.

No mill remains after its wood supply has been burned up.

Splendid Work by Forest Corps

The following letter, speaking in the highest terms of the work which has been done by the Canadian Forestry Corps, has been received by Sir Edward Kemp, overseas Minister of Militia, from Lord Derby, and forwarded by him to Sir Robert Borden:

"Dear Sir Edward:

"I am writing this letter to let you know, on behalf of His Majesty's Government, how warmly they appreciate the splendid work done by the Canadian Forestry Corps in connection with the urgent demand which was received early in February last for some 40,000 tons of timber to be sent to the front. This was an unexpected demand, and it was requested that delivery should be completed not later than the 31st March. Shipment was commenced from the 10th February and the whole order was completed on the 20th March, eleven days ahead of the specified time.

Worked 90 Hours Per Week.

"I am informed that this satisfactory result is mainly to be attributed to the energy put into the work of production by the Canadian Forestry Corps, who supplied no less than 31,000 tons of the total. When the corps understood that it was an order of urgency, and that the material was required for the front, many of the companies voluntarily worked long hours without any extra pay, some of them doing as much as 90 hours per week. They were at work during the whole of the Easter holidays, so that had any further demand been made at that time it would have been possible to deal with it.

"It is, as you are no doubt aware, largely due to the operations of the units of this corps in France that we have, with the exception of sudden and unforeseen demands such as the present one, practically stopped the shipment of British-grown

timber to France, thus saving cross-Channel tonnage; while we are also able to save the shipment of foreign timber by having the production of the corps in England to meet the various national demands.

"Feel Real Gratitude."

"I hope that the Canadian Forestry Corps will realize the real gratitude which we feel for their admirable work and for the spirit which they have shown throughout, in sparing no exertions whenever an opportunity has been afforded them of assisting the fighting men at the front.

"Yours sincerely,
"(sgd.) DERBY.

GERMANY'S PRICE LIST

The Berliner Boersen - Zeitung states that the prices of all sorts of lumber have risen to astounding heights. Latterly the requirements of the army on the eastern front have considerably diminished but orders from the railway car factories have greatly increased. The most serious factor is the scarcity rather than the high price level. Indeed it is a serious problem how the flying machine factories may be kept supplied with sufficient wood. Material for these factories is so scarce that none of the wood which is usually discarded in the sawing is now thrown away. Concerns which do not belong to the flying machine syndicate have to pay at least \$156 per M at the station in East Prussia; concerns which belong to the syndicate pay \$125 per M, i.e., the price fixed by the war office.

Ash is also very scarce and the price is as high as \$226 per M of round wood; although this figure is the fixed official price for sawed ash it does not even represent the average level of prices paid for "free" ash.

Alder costs \$113 per M, when it is obtainable at all. Basswood is very much in demand.

The Forests of Newfoundland

(BRITISH RECONSTRUCTION COMMITTEE REPORT.)

Newfoundland has considerable reserves of timber, which, though under a separate Government, form part of the same Imperial question. They illustrate incidentally how rapidly forests, which at first sight seem vast, may be absorbed. The Newfoundland woods cover 10,000 square miles, but more than a third has been taken over by a single company. The produce from this area, nearly equal to the whole woodlands of Great Britain, feeds the pulp and paper mills of the Anglo-Newfoundland Development Company and supplies the requirements of four British newspapers. Newfoundland has assisted the United

Kingdom during the war with supplies of pitwood from the three-mile belt round the coast reserved by the Colonial Government for the use of the Colony and not ordinarily available for export except in the form of pulp. Labrador, which is a dependency of Newfoundland, is believed to have considerable resources in timber suitable for pulpwood and pitwood.

India, South Africa, Australia and New Zealand are already importers of soft woods, and no relief with regard to future supplies, but rather the contrary, may be expected from those quarters.

French Lecturers do Excellent Work

The educational propaganda of the Canadian Forestry Association this year has taken an unusually practical turn. The aim has been to carry the educational work directly to the door of the settler in timbered districts in an effort to reduce the annual harvest of settlers' fires. It has been proved abundantly that no system of mechanical equipment such as patrolmen, fire towers, telephone lines, etc., is more than half complete in itself and must fail in its objects if the human material responsible for causing the fires is not brought into an intelligent and sympathetic relation towards the whole forest protection enterprise.

Mr. A. H. Beaubien, a talented French speaker with personal knowledge of Quebec conditions in the timbered areas, was engaged by the Forestry Association to hold public meetings covering three weeks in the territory of the Ottawa River Forest Protective Association which embraces twenty million acres. Mr. Beaubien held his first meeting at Ferme Neuve near Mont Laurier, Quebec, on Tuesday, May 7th, il-

lustrating his address with a large number of excellent lantern slides. Mr. Beaubien's route was confined almost wholly to the country settlements, particularly the newer parishes where the greatest need exists for educational activities. At all of Mr. Beaubien's meetings every auditor is presented with reading material which further emphasizes the common sense of being careful with clearing fires. Co-operation of the parish priests and influential local men was secured in advance, the lectures being well advertised by printed matter and by the announcements at the church services.

It is expected that two additional French lecturers will be made available for Central and Eastern Quebec through the co-operation of the Department of Lands and Forests of Quebec.

Mr. J. A. Doucet concluded a three weeks' tour of Northern New Brunswick on behalf of the Canadian Forestry Association, where his public lectures on forest protection were a pronounced success. Large audiences were secured, in one instance

amounting to 550 persons at Tracadie and without doubt a great amount of splendid service to the cause of forest conservation was accomplished through Mr. Doucet's efforts.

In the French Canadian communities to which he confined his lectures, practically no educational work had been done hitherto, except what has come through the French literature of the Canadian Forestry Association.

The parish priests gave most valuable aid and the reception accorded Mr. Doucet in all quarters was hearty.

Other illustrated lectures are being given on the Ontario and Quebec sides of the Ottawa River by the Forestry Association as well as along the Temiskaming and Northern Ontario Railway which goes through the Claybelt in which a very decided fire hazard exists this year.

Lectures in Western Ontario

Mr. Robson Black, Secretary of the Canadian Forestry Association, has been delivering a series of illustrated addresses in North Western Ontario including Fort Frances, Port Arthur, and Fort William. The meeting at Fort Frances was under the auspices of the Patriotic Fund while the Canadian Club at Fort William sponsored the address in that city.

Motion pictures were freely utilized at all points. Other addresses have been given by the Secretary before Boy Scout assemblies and such business men's organizations as the Rotary Club of Brantford which assembled for the purpose at the Brant theatre, and the Kiwanis Club of Ottawa.

A Lantern Slide Service

There are many roads by which public education may travel and one of those that affords least resistance can be found in the employment of lantern-slide cartoons to be flashed before audiences between the reels in a motion picture theatre. The Forestry Association this year has already placed several hundred lantern slides with motion picture theatres from Nova Scotia to British Columbia. Some of these are in the form of colored cartoons while others are striking statements of some outstanding fact connected with forest protection, the extinguishing of camp fires, care with lighted tobacco and matches while in the woods, etc. These lantern slides have met with a splendid reception and will be continued through the summer, each theatre in a timbered district receiving a new assortment of slides each week. As far as can be ascertained the Forestry Association is now covering every motion picture theatre

in the timbered districts of Quebec, Ontario, and New Brunswick. The French slides have been used to excellent advantage, the motion picture theatre proprietors co-operating with the Association in a thorough and generous manner. The Province of New Brunswick is arranging to place new sets of slides periodically with every motion picture theatre in that province.

His Eminence, Cardinal Begin, says:

"For a long time in Canada, general opinion placed an unlimited confidence in the richness of the wooded districts which were supposed to be inexhaustible. But now that their richness has been considerably diminished, it is high time to save what is left."

"It behooves governments, associations, and individuals to give their most serious attention."

RENNIE'S War Time Production Seeds

THERE must be no "slackers" this year, either among the seeds, or the growers. Every man and woman with garden space, must produce to the limit of his or her ability. And that is why Rennie's seeds are so essential—live, vigorous seeds from tested stock, to ensure record crops.

BRUSSELS SPROUTS — Amager	Pkt.	¼ Oz.	Oz.	¼ lb.
Market.....	.10		.90	2.75
CABBAGE —Rennie's First Crop..	.10		.75	2.25
CABBAGE —Early Jersey Wakefield (Improved).....	.05		.60	1.75
CAULIFLOWER —Rennie's Danish Drouth-Resisting.....	.15	& .25	1.00	3.50 10.00
CELERY —Paris Golden Yellow, Extra Select.....	.15	.60	2.00	
TOMATO —Bonny Best (Original).....	.10		.60	1.75
Rennie's Improved Beefsteak..	.10		.75	2.50

FLOWER SEEDS

				Pkt.
New Giant Astermum—Mixed Colors.....				.15
Rennie's XXX Giant Comet Asters—Mixed.....				.10
Dreer's Peerless Pink Aster.....				.15
Early Blooming Cosmos—Mixed.....				.10
Rennie's XXX Exhibition Mixture Pansy.....				.25
Rennie's XXX Prize Ruffled Giant Single Petunia—Mixture.....				.25
Rennie's XXX Large Flowering Globe Stocks—Mixture...				.20
Rennie's XXX Mammoth Verbena—Mixture.....				.10
Giant Zinnia—Mixed.....				.15

**Mail Your Order
TODAY**

LOOK FOR THE STARS

Turn the pages of your Rennie catalogue. You will notice a great many paragraphs with stars at the corners. These are extra special values that defy competition. When buying from dealers insist on RENNIE'S.

THE WILLIAM RENNIE COMPANY LIMITED.
KING & MARKET STS TORONTO
ALSO AT MONTREAL WINNIPEG VANCOUVER

Good Work on Snowball Limits

The following excerpts from a letter from Mr. J. R. Gareau, Forester of the J. B. Snowball Co., Chatham, N. B., show the progress made in introducing Forestry oversight on private holdings:

"Our field work of last summer extended over three months' time and a total area of 100 sq. miles was covered. We made a five per cent estimates. For part of the time we had a two three-men crews party, while for the rest of the season our party was composed of but one four-men crew.

"We managed, however, under these rather unfavourable conditions and in spite of the high price of everything, to do our work for four cents per acre.

"Since last October, all our time has been devoted to logging operations: supervision of the cutting, scaling, etc., Our plans for the future, briefly stated, are the following: From the time the drives begin, to as late as the end of July, my time will be taken up with first, the looking after the drives, and afterwards the scaling on the booms and the towing.

"When all our logs have reached our

mills we will start with our forest valuation work and we intend to have a three three-men crews party and remain in the field from two to three months, but the time we will spend in the field will largely be determined by our next winter's cut of which we have yet no idea whatever.

"Without any other desire than to let results speak by themselves, I may add to the above that we are beginning to see the results of the work which has been commenced here two years ago. For instance ground has been covered and has been cut this winter shows that our estimates proved to be 94.4% of the actual quantity which was cut on the whole of the ground to which these estimates applied; and as to the elimination of waste I may be permitted the following quotation from a letter from Mr. Prince under the date of January 18th of this year:

"We have had several examinations made of your camps and on the whole would say that their work is very satisfactory, and in some cases closer utilization is carried on than in any other parts of the province."

THE TEAK FORESTS OF SIAM

The teak forests of Siam are mainly located on the hillsides in the northern part of the Kingdom, some 500 miles from Bangkok. The teak trees are girdled and allowed to stand for several years before being felled, and the logs are then dragged to the nearest stream and floated down, reaching the saw-mills at Bangkok, fully seasoned, in about 5 years from the time of girdling.

Teak logging is regulated by the Government, and only trees of 76.5 inches girth may be girdled. A Government counting station is located at Paknampoh, a village situated on the River Chao Phya, 155 miles from Bangkok. The average number of teak logs arriving at this station each year is estimated at 100,000, and in addition about 20,000 logs, cut from the forest region adjoining Burma, are floated to Moulmien.

The total annual output of cut teak of all grades amounts to roughly 55,000 loads of 50 cubic feet, but of first quality the yearly output would likely reach only about half of the above estimate. On reaching the saw-mills the logs are usually squared and the first-quality squares are graded according to the British Admiralty specifications, and are designated "Europe first class."

Our Coal Bill Affected by Timber Shortage

How Canada's Coal Prices are being added to by Pennsylvania's Scarcity of Mine Timber is interestingly told in the following from the Philadelphia North American.

"One of the most serious problems confronting the anthracite operators is the difficulty in securing sufficient timber to properly ensure the safety of the miners. This is especially true of the heavier timber needed for gangway purposes, and at the present time operations have been temporarily halted on account of the inability of timber contractors to meet the ever increasing demands upon them.

Virtually all of the mountains in the anthracite fields have been stripped of their virgin timber and in many places the young growth has been cut to meet the demand. Owners of the few remaining virgin tracts are demanding fabulous prices. The cost of mine timber has been steadily climbing for the last several months, and while the coal companies have indicated their willingness to pay the prices demanded, they have been unable to get the needed supply. Shipments of heavy gangway, slope and shaft timber from the far south have been greatly curtailed since the freight congestion early in the current year. In many instances timber shipped from Georgia and consigned to the mines has been commandeered by the government for use in the shipyards.

Contractors throughout central Pennsylvania are cutting every available stick of timber. Roadsides once sheltered by giant oaks have been stripped of that protection. Whole rows of big trees that once gave beauty to the farm lands have been cut down and sent to the mines. Small tracts held by estates have been disposed of at unprecedented prices."

HONOR FOR COL. GRAVES

Col. Henry Graves, Forester of the United States Forest Service, has been elected Honorary Member of the Royal Scottish Arboricultural Society of Edinburgh, Scotland, in recognition of his eminent services to forestry.

The Royal Scottish Arboricultural Society was founded in 1854 and shares with the Royal English Arboricultural Society the leadership in forestry matters not only in Great Britain but to a large extent throughout the British Empire. Its list of 1,500 active members includes the names of a large number of professional foresters in the British Colonies and possessions, all over the world, but the Society has less than thirty honorary members, of whom about half are distinguished foreign scientists and administrators, mainly European.

The Society, in addition to the publication of its transactions and the consideration of papers at its regular meetings, makes an annual excursion for field study. It also offers annual prizes and medals for essays on practical subjects and for inventions connected with appliances used in forestry. Such awards have been granted continuously since 1855.

This distinction is shared by Colonel Graves with only one other citizen of the United States, Dr. C. S. Sargent, who was elected an Honorary Member in 1889.

"WOODMAN SPARE THAT TREE"

According to "The Little Journal," published by Arthur D. Little, Limited, Cambridge, Mass., only about one third of a long leaf pine tree is used as merchandise, two-thirds being destroyed or discarded as waste.

War Needs Over-ride Private Rights

The right recently assumed by the British Columbia Government to enter upon and utilize any area of spruce timber for aeroplane construction without the consent of the owner is thus defended by Mr. H. R. MacMillan, forestry expert of the Spruce Production Department, Imperial Munitions Board:

"If we had to wait until everybody that had an interest in a particular stretch of spruce-bearing limits had made up his mind that he could do no better than accept our offer, the war would be over before the spruce would be cut. The owners of the spruce that is available are scattered all over the world, and even with the utmost co-operation on their part when we did get in touch with them, tremendous delays would result owing to the time taken to send paper back and forth. When to this is added the natural hesitation of men to part with what they believe to be valuable property until they are quite sure they are obtaining a fair equivalent, it will be seen that in effect a great deal of spruce is practically tied up indefinitely.

"The spruce bill meets this situation. It gives power to cut spruce and fixes the price the owner must accept. That price is \$6.00 per thousand for first-class spruce, and \$2.50 for second. The money is paid for all logs that are put into the water on the figures furnished by a government scaler. The owner is under no expense. We cut the spruce and we take all the risks of towing to the mill. The owner gets his price net. The money is paid over to the provincial government and is kept in a trust fund, out of which the owners receive their respective quotas.

"The prices we offer are generous. The best evidence that they are the best that anyone could expect is shown by the fact that although they have been published for several weeks the first complaint that they are not high enough has yet to be received.

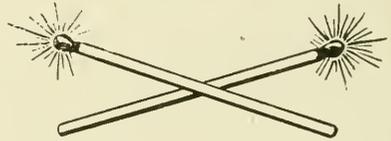
"As things will stand when the bill becomes law we shall be able to go in and take the spruce we need wherever we can find it, regardless of all questions as to ownership, and the owner will get adequate compensation."

AHEAD OF THEM ALL

Quebec leads all Canadian provinces in pulp and paper making. In 1916, 924,000 cords of pulp wood were cut by Quebec workmen, and this huge log pile was worth almost \$7,000,000. Ontario came second, with 637,000 cords cut.

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

ASK  FOR



 **Dry Matches**
After all day in a boat, rainstorm or wet snow. Ask your dealer for

MARBLE'S WATERPROOF MATCH BOX

If he can't supply you, we will send prepaid for his name and 50 cents. Dry matches may save your life.

MARBLE ARMS MFG. Co.

Dept. 5160

Gladstone, Mich., U.S.A.

FAIRBANKS-MORSE

Portable Forest Fire Pump



*Weights 120 lbs.
Will pump 20
gallons per min-
ute against a
pressure of 120
lbs. per sq. in.
Readily trans-
ported by Horse,
Auto, Canoe; or
by Hand, it
will reach any
fire alone or in
relays.
Hundreds in use.*

The Canadian Fairbanks-Morse Co., Limited

"Canada's Departmental House for Mechanical Goods"

St. John, Quebec, Montreal, Ottawa, Toronto, Hamilton, Windsor, Winnipeg,
Saskatoon, Calgary, Vancouver, Victoria.

Slacker Lands in War Times

BY J. A. MITCHELL, U. S. FOREST SERVICE

The *great* menace of fire unquestionably is to the future of our timber supply. In the piney woods, particularly, repeated fires are fatal to the establishment of reproduction; while in the hardwoods the trees, though not always killed, are stunted and deformed and laid open to fungus and insect attack. As young growth seldom has an immediate commercial value, its loss is usually ignored—the fact that a *crop* has been destroyed, being overlooked. The loss in such a case is as real as if merchantable timber were destroyed—the destruction of a ten-year-old stand postponing under present conditions, the date of a possible harvest from fifteen to twenty years, if not indefinitely. At the same time, the land burned over has, to all intents and purposes, been rendered unproductive for a corresponding period. Herein lies the importance of fire protection from an economic standpoint, for no potentially productive land should be allowed to lie idle. The community has a right to and will, sooner or later, demand that it be producing something.

Ontario Fire Rangers

Of the personnel of the Ontario fire ranging force this year the Toronto "News" says:

The force this year consists of 1200 men, about seventy-five per cent. of those engaged coming from northern Ontario, many of them being experienced woodsmen. The remaining twenty-five per cent. is composed chiefly of returned soldiers. In the last two or three years fewer students have been engaged for this work and this year none have been taken on the staff.

Last year a number of returned soldiers, suffering from shell shock, were placed on the staff. They were taken from hospitals where they were being treated. The work in the north was found very beneficial to them, and this year an additional

number has been engaged. No men who have been exempted from military service or boys under military age are being employed this year. The department feels that if men of those ages are fit for fire-ranging they are fit for farming, too. Most of the men are married or are over military age. They range in age from thirty-eight to fifty-five. It is necessary to secure the men by April 15, otherwise some of them would be away hunting.

This year the department is adding further equipment to several of its stations. Last year automobile trucks were experimented with, and they were found to be very satisfactory, as it is possible for a truck to carry twelve men with all equipment. These trucks are stationed at such places as Cochrane. This year five more trucks have been added.

FOR BETTER PRAIRIE HOMES

"The demands that were made during the year on the Mitchell Nurseries at Coaldale, twelve miles from Lethbridge, for trees, shrubs and small fruit plants give evidence that farmers' households are improving their home surroundings and adding to their material comfort. The men folks on the farm are usually indifferent in such matters, and they do not seem to appreciate the fact that the money value of a farm is greatly increased if the house and buildings are surrounded with trees; for so long as the human eye will invitingly wander to a bluff of trees, so long will an asset of this nature have an actual money value; the farm animals and poultry, too, appreciate the shade.

The womanfolks have too long been contented with promises that the trees will be planted "next year"; but trees do not grow on promises, although they always do well on summerfallowed land.

The bleak and uninviting appearance of the country school houses

TREES, SHRUBS AND SEEDS

Hardy Northern Trees and Shrubs at Lowest Prices. Native and Foreign Tree Seeds

EDYE-DE-HURST & SON, DENNYHURST

DRYDEN, ONT. Shippers to H. M. Government, Etc. Correspondence Francaise.

Hill's Seedlings and Transplants

ALSO Tree Seeds for Reforesting. Best for over half a century. Immense stock of leading hardy sorts at low prices. Write for price list and mention this magazine.

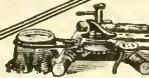
Forest Planters Guide Free.

The D. Hill Nursery Co., Evergreen Specialists
Largest Growers in America.

Box 503 Dundee, Ill., U.S.A.

Try This Stump Puller at Our Risk

The Smith Stump Puller will take out every tree and stump by the roots, clearing from one to three acres a day, doing the work of twenty men. We want you to send for our 3 year guarantee against breakage and our free trial proposition. Address
W. Smith Grubber Co.
11 Smith Sta.
LaCrescent, Minn.



YALE UNIVERSITY FOREST SCHOOL

NEW HAVEN, CONNECTICUT, U.S.A.

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

For further information address

JAMES W. TOUMEY, Director
New Haven - Connecticut

Gagnon & Marisette

Lumber Contractors
Timberland Cruisers
Forest Industries

CHICOUTIMI, P.Q.

LT.-COL. L. J. D. MARQUIS

Forest Engineer and Mem. Can. Soc. of F.E.;
Quebec Assoc. of F.E.; Former Mem. Que. F. Service

Forest Cruising and Mapping
Timber Factors and Logging Costs
Facts on Forest Growth and Future
Products

90 LOCKWELL AVENUE, - - QUEBEC

R. R. BRADLEY

Forest Engineer and Mem. Can. Soc. of F. E.
Consulting Forester to the New Brunswick Railway Co.

Timber and Pulpwood Estimates. Forest Maps. Advice on the Management of Wood Lands. Timber lands listed for sale.

CLOBE ATLANTIC BUILDING, ST. JOHN, N.B.

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

could be entirely changed by the cooperative effort of a few public spirited farmers, who might very readily arrange among themselves to summerfallow a strip of land in the school grounds, get the trees heeled in the fall, and set them out in the following spring. The teacher and scholars would be glad to look after the work of keeping the ground cultivated to conserve the moisture for the growth of the trees afterwards." —From Annual Report of President Marnock of the Lethbridge Board of Trade.

CONFEDERATION LIFE

ASSOCIATION UNCONDITIONAL ACCUMULATION POLICIES

Are liberal up-to-date contracts which guarantee to the insured every benefit consistent with safety.

Write for Particulars

which will gladly be furnished by any representative of the company or the

HEAD OFFICE, TORONTO



QUEEN'S UNIVERSITY

KINGSTON
ONTARIO

ARTS MEDICINE EDUCATION APPLIED SCIENCE

Mining, Chemical, Civil, Mechanical and
Electrical Engineering.

HOME STUDY

Arts Course by correspondence. Degree with
one year's attendance.

Summer School **Navigation School**
July and August. December to April.

GEO. Y. CHOWN,
Registrar.

MINIATURE CONSTRUCTION

Landscape, Mechanical and Architectural Models, Topographical Maps and Paintings. for

SCHOOLS — COLLEGES — MUSEUMS
Government work a specialty

MORGAN BROS. CO., Inc.
MODEL MAKERS

Room 1650 Grand Central Terminal
Phone 7720 Murray Hill

NEW YORK CITY

UNIVERSITY OF NEW BRUNSWICK

FREDERICTON, N.B.

DEPARTMENT OF FORESTRY
Established in 1908

Best of facilities for definite instruction and supervision in Practical Forestry.

Surveying, cruising and construction work carried on in our own tract of 3600 acres, with Forestry Camp in the centre.

Competent men from the School at present in demand to take up Forest Survey work with the Provincial Crown Land Department.

For further information address :

DEPARTMENT OF FORESTRY

University Calendar furnished on application.

C. C. JONES, Chancellor.

R. O. SWEZEY

(B. Sc., M. Can. Soc. C.E.)

CONSULTING ENGINEER.

Water Powers. Timber Lands.
Financing Forest Industries.

164 St. James St. MONTREAL.

My Story

(From an Illustrated Brochure Distributed by the Canadian Forestry Association to 3000 Alberta Settlers in Timbered Districts)

"I'm an Alberta farmer. Fifteen years ago, I owned a place in Peel County, Ontario. In the spring of 1916 I started West.

Queer chances interfere with plans sometimes and I never reached beyond Matheson, a brisk little town on the Temiskaming and Northern Railway. I left the train for a day; I didn't get aboard again for six months. The country looked too good to miss. Splendid rich soil, good roads, a first class railway, and ready markets. Being a new country, most of the clearings were marked off by thick patches of spruce bush.

When midsummer came, the smoke of bush fires was everywhere. Hot mornings gave way to hotter afternoons and still the fires raged. Sometimes a settler would pile his debris against the standing timber on the edge of his clearing and then set fire. Another might attempt a wind-row, out of reach of the spruce bush, but with no one watching it the first night breeze sent the flames racing across the peaty topsoil and into the forest. On my brother's farm, we tried to burn during the hottest days and burn safe, too. But you might as well talk of having a safe smoke over a powder keg.

I recollect one day saying to my brother: "This slash burning is bound to put some of us in the graveyard,—if rain doesn't come before Saturday."

He neither agreed nor disagreed. Through the kitchen door I could see the clouds of smoke gathering across the settlement.

"You play with death," I warned, "every time you start clearing fires in weather like this."

"How else will the land get cleared?" my brother asked.

Safe or Unsafe Ways?

"They get it cleared just as quick in Quebec, Nova Scotia and British Columbia, and most of the States," I told him, "but they make the job a safe one. They have a law that settlers can't start slash fires without a written permit from a fire ranger. They can't start a fire during drought, and what's more, they have to pile slash back from the timber. When that is done, the settlers' families are not afraid of being burned out every few years and the newspapers don't argue over the exact number of youngsters caught in the flames."

"A man in a new country must take chances"—but as my brother said that, his eye lighted upon his two little girls, and his boast sounded pretty hollow.

Well, you have all heard about that week—end of July, 1916—when with hardly an hour's warning, all the innocent-looking bush fires joined forces and roared down the country like the Day of Judgment. Fleeing men and women and their children were dragged down as if by hungry wolves. No refuge was safe. Mine shafts were charnel houses, and even the small rivers were a useless protection. My brother, being close to Matheson, brought out his family in safety, but his five years' labour was gone in thin air. Two hundred and twenty-three people, mostly women and children, died that week-end, because settlers did their burning "as they pleased" and without reference to the laws of safety.

Of course, all that is changed in Ontario, for the year following the fire, they started fire ranging in the settlements and made every settler take out a permit for his burn. The fires are supervised just as in nearly

all the other provinces. Life is safe and the people are gradually forgetting the times when forest fire horrors were continually before their eyes.

Inviting Another Horror

Since I came to Alberta, I have seen those same Ontario conditions of the days before the fire duplicated in almost every detail. We have the settlements in the tree-covered country of the north. In fact nearly all the new farmers are homesteading in more-or-less timbered territory. We have to use fire to burn off our slash and we have been doing it just like Ontario used to do—with a strong invitation to a wholesale waste of life and property.

I'm a farmer—couldn't earn my living at anything else—but I can see beyond my farm gate when the good of the Province of Alberta is at stake. I can see that Alberta can't get along on merely bare land and a set of strong muscles. We need coal to keep us warm, wood for buildings, posts and implements; we need towns and cities to provide a near-by market, and we need all the manufacturing industries we can lay hands on.

There's none of these things can come to, or continue in, Alberta, unless we all join in saving the forests. The coal mines are no good to us without wooden pit props, and if pit props get scarce up goes the price of coal. There's not much use having water powers unless they have something to bite on. They must have raw materials, like wood, to turn into products.

What good is cheap land if fence posts and lumber are too dear to purchase? What hope is there for industries in Northern Alberta unless they are *forest industries*.

A neighbour told me the other day that there was no room for the forest in northern Alberta, that every acre would soon be under crops.

"Crops?" I retorted, "what crops? When I tell you that not twenty acres in a hundred in northern Alberta can grow wheat or support stock, I'm not basing my talk on an ignorant opinion. Look at this!" And I unfolded a Dominion Government Report

proving that only about one acre in five in our part of the country was any good for field crops. "What becomes of the four-fifths?" said I.

He didn't know.

A Western Desert

"Will it be a desert waste of blackened stumps and useless soil, or will it produce timber? Will it fetch pulp and paper industries into this country, with their busy towns and pay lists, or will it be a No Man's Land forever? Will it keep the settlers supplied with cheap fuel and building materials, or must we import them at high prices from *British Columbia*?"

Do you wonder that I have no use for forest fires? Every time I see one, I see a cloud of trouble. I see higher cost for farm necessities, and a poorer chance of making Alberta prosperous for my children.

Personally, I never start a clearing fire until every precaution has been taken. I pile my slash fifty to a hundred feet from the standing bush. I burn only in safe weather, usually in the evening, and keep watch on the operation all through. I consult the fire ranger and follow his instructions.

The rangers are not policemen, I take it. They are the best friends the settler has. Some of these rangers have been telling me that the Alberta staff have set out this year to keep Alberta clear of forest fires. They want the personal help of every man, every woman, every boy and girl who lives anywhere near timber.

Every good citizen this year is to look on himself as a deputy fire-ranger.

Watch every kind of fire—but above all, keep a tight rein on the slash burning.

That's all that your country asks. You'll see to it, won't you?"

PHILIP T. COOLIDGE FORESTER

Timber Estimating and Mapping.

Supervision of Lumber Contracts.

Surveying. - - Forest Planting.

STETSON BLDG., 31 CENTRAL ST.
BANGOR, MAINE.

Useful Forestry Books

FERGUSON—FARM FORESTRY

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

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

KINNEY—THE DEVELOPMENT OF FOREST LAW IN AMERICA

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

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

KINNEY—THE ESSENTIALS OF AMERICAN TIMBER LAW

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

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

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

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

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

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

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

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

TAYLOR—HANDBOOK FOR RANGERS AND WOODSMEN

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

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



PETERBOROUGH CANOES

For service our Canvas Covered Canoes are unequalled. We make a complete line of Canoes, Skiffs and Motor Craft. Our catalogue will be of interest to you.



Peterborough Canoe Co., Ltd., Peterborough, Canada



(Successors to Metropolitan Air Goods Co.)

SLEEP ON AIR with a COMFORT SLEEPING POCKET

Recommended by the Forest Service, Campers, Physicians, Invalids, Tuberculosis Patients and Sportsmen everywhere. A warm, dry, comfortable bed. Wind, rain, cold and water-proof. Packs 6 x 25. Air goods for home, camp, yacht, canoe, etc. Illustrated Circular Free by mentioning Canadian Forestry Journal.

**ATHOL MANUFACTURING CO.,
ATHOL, MASS., U.S.A.,**

Dealers write

FOREST TELEPHONES



Make the life of the forester better worth living. They relieve him from the appalling loneliness. They help him to keep in human voice touch with foresters miles away.

In emergencies—fire—sickness—hunger—the speed with which they can summon help is marvellous.

Write for full particulars of how to install the Northern Electric Forest Telephone System. Address the Office nearest you.

**Northern Electric Company
LIMITED**

Montreal
Halifax
Ottawa

Toronto
London
Winnipeg

Regina
Calgary
Vancouver

Northern · Electric · Forest · Telephones ·

Canadian Forestry Journal

Vol. XIV.

JUNE, 1918

1713

No. 6



FACULTY OF FORESTRY

JUL 23 1918

UNIVERSITY OF TORONTO

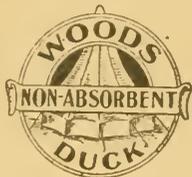


Making the Earth to Bring Forth its Fruits; Two Ways We Have of Doing it.

24319

TENTS IN EVERY STYLE

May be had made up of
the celebrated



Write for Samples and Prices.

The Woods Manufacturing Co., Ltd.

FORMERLY SMART-WOODS, LTD.

OTTAWA - TORONTO - MONTREAL - WINNIPEG

FOREST TELEPHONES



Make the life of the forester better worth living. They relieve him from the appalling loneliness. They help him to keep in human voice touch with foresters miles away.

In emergencies—fire—sickness—hunger—the speed with which they can summon help is marvellous.

Write for full particulars of how to install the Northern Electric Forest Telephone System. Address the Office nearest you.

Northern Electric Company
LIMITED

Montreal
Halifax
Ottawa

Toronto
London
Winnipeg

Regina
Calgary
Vancouver

Northern Electric Forest Telephones

Canadian Forestry Journal

CIRCULATION 6500 COPIES MONTHLY

Vol. XIV.

WOODSTOCK ONT., JUNE, 1918

No. 6

CONTENTS FOR JUNE

- “Claybelt Settlers Join Hands With Rangers”
 - “The Mill and the Farmer”
 - “Forest Fires Taking Serious Toll”
 - “Machine Guns or Forest Fires”
- “Forestry Course for Returned Soldiers”
 - “The Poet’s Reading of the Trees”
 - “Finland’s Public-owned Forests”
- “What the Railways are Doing for Forest Protection”
 - “War Record of Dr. Fernow’s Students”
 - “The Management of Woodlots”
 - “Digging Wealth from Buried Trees”
 - “The Tragedy of Cross Forks”
 - “War and the Birds”
 - “The Fight to Save Our White Pine”
- “War Needs Collide with French Traditions”
 - “Good Results of Prairie Planting”
 - “Genealogy of Forest Products”
- “The National Purse and the Paper Mill”
 - “New Brunswick on the Right Track”
 - “Great Fire Hazard in N. W. Ontario”
 - “Research Council and Reforestation”
 - “Paying the Fire Fiend his Price”

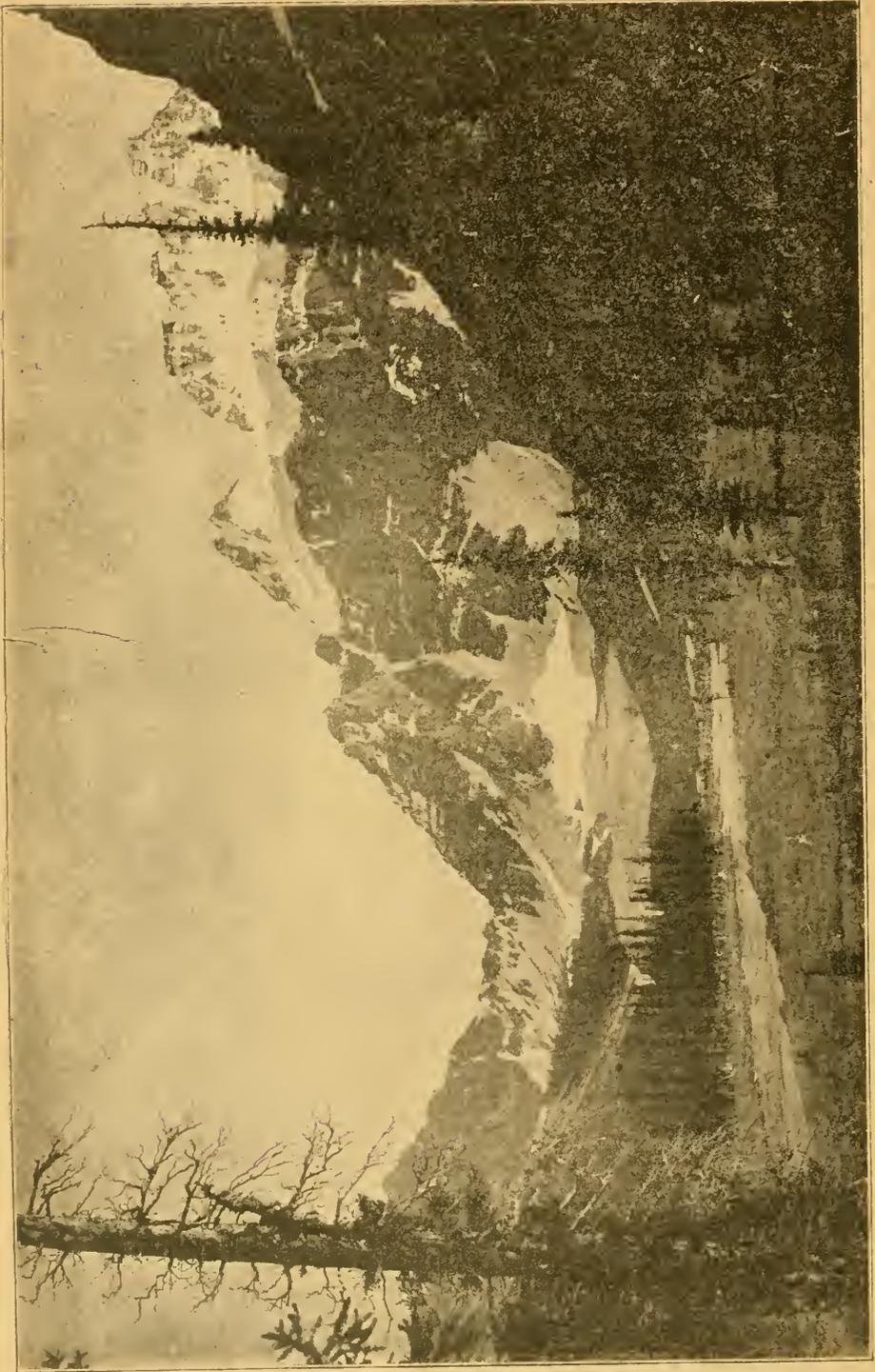
The Canadian Forestry Journal will be sent to any address for one dollar a year, subscription including all other publications of the Canadian Forestry Association.

Address all Communications to

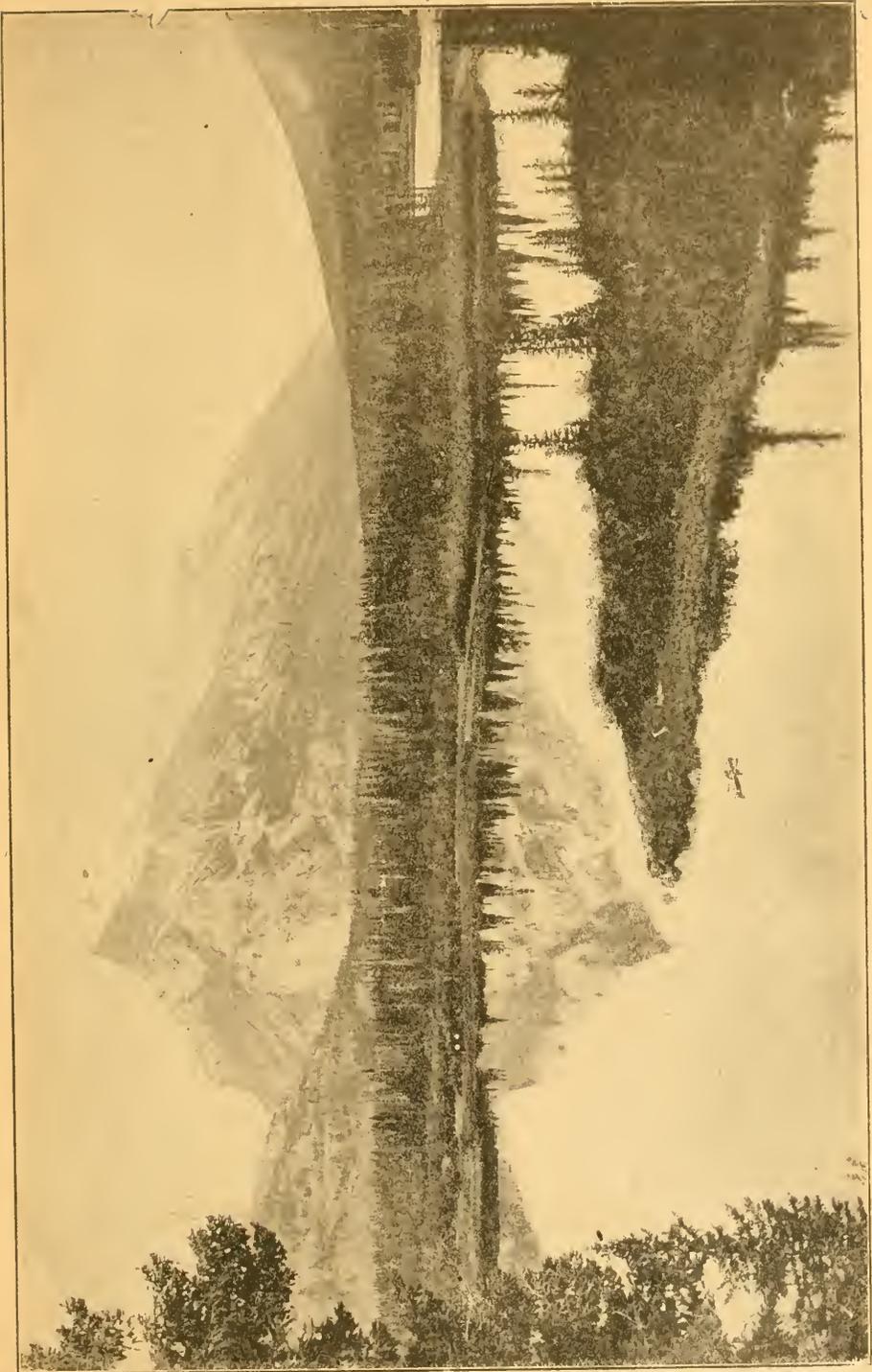
THE CANADIAN FORESTRY JOURNAL
206-207 BOOTH BUILDING, OTTAWA

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

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



CONSOLATION VALLEY AND MOUNT TEMPLE, LAGGAN, ROCKY MOUNTAIN PARK



REFLECTION OF MOUNT RUNDLE IN VERMILION LAKES.

Claybelt Settlers Join Hands With Rangers

The people of Ontario, whose concern over forest fires was greatly stimulated by the 1916 Claybelt disaster, may rest assured that the present efficiency of the Forest Protection Service bears a cheering comparison to that of previous years. The building up of a protective service is no small undertaking and there remains much to be done before the machine can be said to be complete, but the procedure of the Department of Lands and Forests has been along right lines and the results are bound to give general satisfaction.

The Secretary of the Canadian Forestry Association recently covered part of the territory in the heart of the district that gave greatest trouble in 1916—Matheson, Porquis Junction, Iroquois Falls, Cochrane, and Hearst. This is now well organized under a very competent superintendent, Mr. E. R. Poole of Cochrane, who has equipped his division with lookout towers, canoes, speeders and other aids in travel and observation. Perhaps the most heartening conclusion in one's visit to the Cochrane district is that settlers are co-operating with the rangers in safeguarding their land-clearing fires. A very few summonses were issued as a guarantee of the Government's sincerity in applying the permit law. With that as a reminder, the rangers proceeded in their work with a maximum of tact and consideration, realizing that the control of settlers in an unorganized country is a most difficult proposition and that unless their goodwill is gained the issue of permits and control of fires becomes practically impossible. For that reason, the personal qualification of the rangers assumes first importance. No man should be retained in the Service who bullyrags or antagonizes the decent settler or tries to tie him up with red tape. The importance of the district superintendent's duties cannot be over-

emphasized, for it is he who knows his settlers personally and knows the way they should be handled. For the same reason, there can be no cast-iron rules fastened upon all parts of the forested region, for what will suffice with one district and one class of settlers is not precisely applicable to other conditions.

In the Cochrane district very little trouble with settlers fires has been experienced. Permits are being applied for regularly and the Forest Fires Act is taken with due seriousness. High prices of pulpwood, of course, act as a further damper to needless destruction. The soldier colony at Kapuskasing appears to be a model in its observance of the Fire Laws and in all the heavy burning this year on soldiers' lots, normal precautions have been taken and the ranger's advice sought on many occasions.

WASTED WOOD IN B. C.

The indiscriminate cutting of convenient shore timber by hand-loggers in British Columbia results in the injury of many good logging sites; for, as the hand-loggers are not allowed to use steam power, they fail to get to the water a large proportion of the trees they cut down. It is estimated that at least 40 per cent. of the trees cut by hand-loggers are wasted in this way," says a pamphlet on "Forest Resources in British Columbia," issued by the Commission of Conservation.

"Since these workings are nearly always situated at the foot of a mountain and at the water's edge, where a destructive fire is most likely to start and gain headway, the resulting debris products a fire menace of the worst kind.

"It is extremely doubtful whether the advantages gained in forest utilization by this means, or the

furnishing of employment to the nomadic, irresponsible men who follow the occupation of hand-logging are commensurate with the resultant damage. Though the discontinuance of hand-loggers' licenses was recommended by the British

Columbia Forestry Commission in 1910, they are still issued.

"During the last 28 years, hand-loggers have destroyed the timber on over 1000 miles of shore line extending back from 100 to 1300 feet, and covering an area of 50,000 acres."



A Big Fire but a useful one. Burning off a Settler's Slash in the Cochrane Division, Ontario. The slash is well piled, and plenty of watchers are on hand.



Up-to-date Outfit of the Ontario Forest Protection Service at Cochrane. Some of the Canoes Ready for Shipment to Rangers.

The Mill and the Farmer in Northern Ontario

Ontario's Claybelt area between the Quebec border and Hearst, along the National Transcontinental Railway offers one of the best possible illustrations of a working partnership between the forest and the farm. The lands are heavily covered with spruce and balsam and poplar, spruce running as high as 80 to 90 per cent. of the stand. The newly-arrived farmer must clear his lands of the tree growth as a preliminary to field crops. In his first two years he cannot hope to open up enough soil to give him a profit, but with the aid of the pulpwood selling at the track for \$7 and \$7.50 a cord (un-rossed), he can manage to make satisfactory wages while clearing his property. It is, therefore, contrary to the settlers' financial interests that the forest materials should be wasted in the clearing process through wholesale conflagrations. A much more potent argument against destructive fires is the necessity of having in the Claybelt country industrial towns to furnish a market for farm products (including pulpwood) and to provide periodical employment. Such

a combination is seen at Iroquois Falls, where the Abitibi Power and Paper Company has a pay list of \$110,000 a month and will buy every pound of farm produce raised in the surrounding country for many years to come. Results of the same nature will follow the new pulp mill at Kapuskasing, to be erected by the Spruce Falls Pulp and Paper Company, of which Mr. E. Stewart, Toronto, (former Director of Forestry) is Managing Director. This plant will create an industrial town on the C. G. R. at one edge of the soldiers' settlement. It will provide not only a centre of employment and immediate buyer for settlers' wood, but will make a produce market in which every soldier-settler can dispose of his goods at the best prices. The location of these mills in the spruce-covered Claybelt supplements in a most valuable manner the cause of settlement. There appears to be plenty of spruce to keep the mills supplied with raw material, if forest fires are suppressed with every means in the power of the Forest Service.

Forest Fires Taking Serious Toll

Outbreaks in Nova Scotia and New Brunswick Result in Substantial Losses

Forest fires have caused large losses during May and June. New Brunswick and Nova Scotia have suffered forest damages that will probably prove the heaviest for many years past.

Nova Scotia, which has enjoyed recent immunity from serious fire trouble, has been obliged to witness the destruction of substantial tracts of badly-needed timber and the burning

of improved property which in the total will form a large sum. Complete reports of the Nova Scotia fires have not reached Halifax at the time this issue of the Forestry Journal goes to press. Newspaper reports, however, and some private information show that the series of fires during June placed a severe test upon the Nova Scotia system, and may cause some revision of

present arrangements in order to combat future outbreaks. Nova Scotia experienced a very dry May and during the month of June had only one good rain, so that grass land was rapidly going back and pasturage for cattle was becoming a real problem.

The Windsor, N. S. Tribune of Friday, May 24th, reports several devastating fires in Hants and other counties, over which the flames, according to this newspaper, had been raging for ten days.

The Amherst Daily News of May 11th stated that a brush fire at Oxford Junction had caused loss of \$50,000 to cut timber alone.

Another despatch from Windsor, N.S., dated May 20th, asserts that the damage in Hants County from

forest fire destruction is estimated at over \$200,000.

The Anglican Church and hall at Queensport, near Guysboro, N.S., were destroyed and in the vicinity many houses and barns were burned. Other forest fires were reported from the vicinity of Annapolis. On May 18th raging fires were visible within a short distance of Halifax. A special report to the Forestry Journal declares that as a consequence of fires started by engines on a logging railway one lumber company lost \$6,000 in standing timber. The same fire spread to adjoining lands causing a similar loss and necessitated the cutting at once of a tract of hemlock.

Calls for military help were sent to Halifax and the prompt response greatly assisted in limiting the zone of damage.

Trouble in New Brunswick

In New Brunswick, according to a statement issued by the Department of Lands and Mines, the two chief forest fires to the end of May did damage to the extent of nearly \$60,000. The fire on the Sinclair limits in Northumberland County, resulted in about \$40,000 damage, which was principally to the supplies and warehouses of the Sinclair Lumber Company. The fire at Maltais Stream between Kedgewick and Anderson, in Restigouche county, burned pulpwood and railway ties to the extent of about fifteen thousand dollars.

The section in Restigouche county where the fire broke out early in the week, is the most important Crown Land section in the province, and if the fire had not been put under control, it would have been the most serious loss that ever happened to the Crown Lands of the province. It was in the vicinity of Grimmer and Hazen Settlements.

Chief Forester Prince directed the fire fighting at Sinclair limits, forty

miles from Doaktown. He left Fredericton Saturday by automobile and after driving all night and most of the next day, struck into the forest on Sunday night. His assistants started in with one hundred men on Monday to fight the fire, and at about 11 o'clock the rain came on.

The Department at Fredericton also received reports to the effect that serious fires were raging along the International Railway in Restigouche County, but that these had been placed under control by the Forest Service.

On account of the lack of rolling stock, enormous quantities of railway ties, pulpwood and telegraph poles are piled along the International Railway which now is operated by the Canadian Government Railways, awaiting shipment, and a forest fire, should it gain headway at almost any point along the railway, would cause huge financial loss. The fire reported to the Department was in piles of manufactured lumber. It was between Kedg-

wick and Anderson stations and near Hazen, Grimmer and Stewart Settlements. In the event of a big forest fire in that section there would be loss of human life without much doubt and destruction of large areas of the most valuable timber land in the province.

The New Brunswick fires came as a surprise to those who were aware that the weather in New Brunswick this season had been anything but favorable to forest fires; in fact until the outbreak mentioned above only a few trifling fires had been reported. The Department of Lands and Mines is sending out numerous placards warning fisherman, hunters, lumbermen and others having occasion to go into the woods, to be careful in lighting and in extinguishing camp fires, and in the use of matches. These placards are being posted in conspicuous places in the woods by fire wardens, game wardens and others. Other fire preventive measures will be adopted as soon as the new regulations passed at the last session of the legislature are brought into effect.

Campers Caused These Losses.

According to the Department of Lands and Mines *three of the fires which have caused most anxiety this year were traced definitely to unextinguished camp fires.* For example, a fire near Eel River, York County, was started by people who had gone into the country for a Sunday picnic and had lighted a fire for their mid-day meal. They packed camp without taking the precaution to put out the fire with the result of a very heavy loss to the public treasury. Two other fires in succession were reported as being due to exactly the same cause.

The trouble experienced in New Brunswick this year cannot be regarded as offering any comment upon the efficiency of the new Forest Service. The organization remains practically the same as last year inasmuch as the Act creating the Forest Service and arranging for the improvement in its machinery and personnel went into effect only re-

cently and the administrative commission has just held its first meeting.

According to the Pulp and Paper Magazine a forest fire on the Picauga River near Chicoutimi, Quebec, communicated itself to the provision stores of Price Bros., Limited, causing a loss of \$25,000. A despatch from St. Johns, Nfld., declares that a fierce forest fire broke out at Gambo on May 22nd, destroying a considerable amount of growing timber.

Fishermen and Pioneers

Fredericton, June 9.—Fishermen and picnics are assigned by the Department of Lands and Mines as the cause of the fires which have done considerable damage in the forests of New Brunswick already this season. The greatest damage and the largest number of fires, occurred this week and followed directly after June 3, the King's birthday, which was observed generally as a holiday. In several cases fires were traced directly to fires started by pleasure parties for the preparation of food and imperfectly extinguished or not put out at all.

In practically all cases of fires starting in the woods they have been caused by inexperienced persons. In no cases have men whose business takes them into the forests started fires in the woods which have damaged standing timber. There is less excuse for pleasure parties causing fires this year than ever before, for press notices and slides at the picture houses and posted notices have warned most persons of the danger of forest fires.

CREDIT TO THE COMMISSION

Some recent descriptions of the establishment of the Forest Products Laboratories at Vancouver, to be engaged in the solution of the special problems relating to British Columbia woods, have unintentionally omitted the important fact that the agitation for these laboratories was instituted by the Commission of Conservation which has shown great energy in promoting the idea through all its stages.

Machine Guns or Forest Fires

If Canada presented Germany with one hundred machine guns, the Government responsible for the act would not only be deposed but thrown into prison.

Any weakening of Canada's natural resources is equivalent to direct gift to the Teuton adversary. It adds to our handicaps and to his relative advantages. It saps this country's power to bear up in time of war and during the trade struggle of peace times, for the natural resources are the great keystones on which the national arch depends.

To have our forests burn down by wanton acts of our own population is quite as pleasing to the Hun as to send paid bombers into our munition plants.

To see the national strength reduced by stingy fire protection serves the German aim quite as handily as to submarine our ships.

If German forests were disappearing as fast as our own, some sense of military satisfaction might be felt at the present time. But such is not the case.

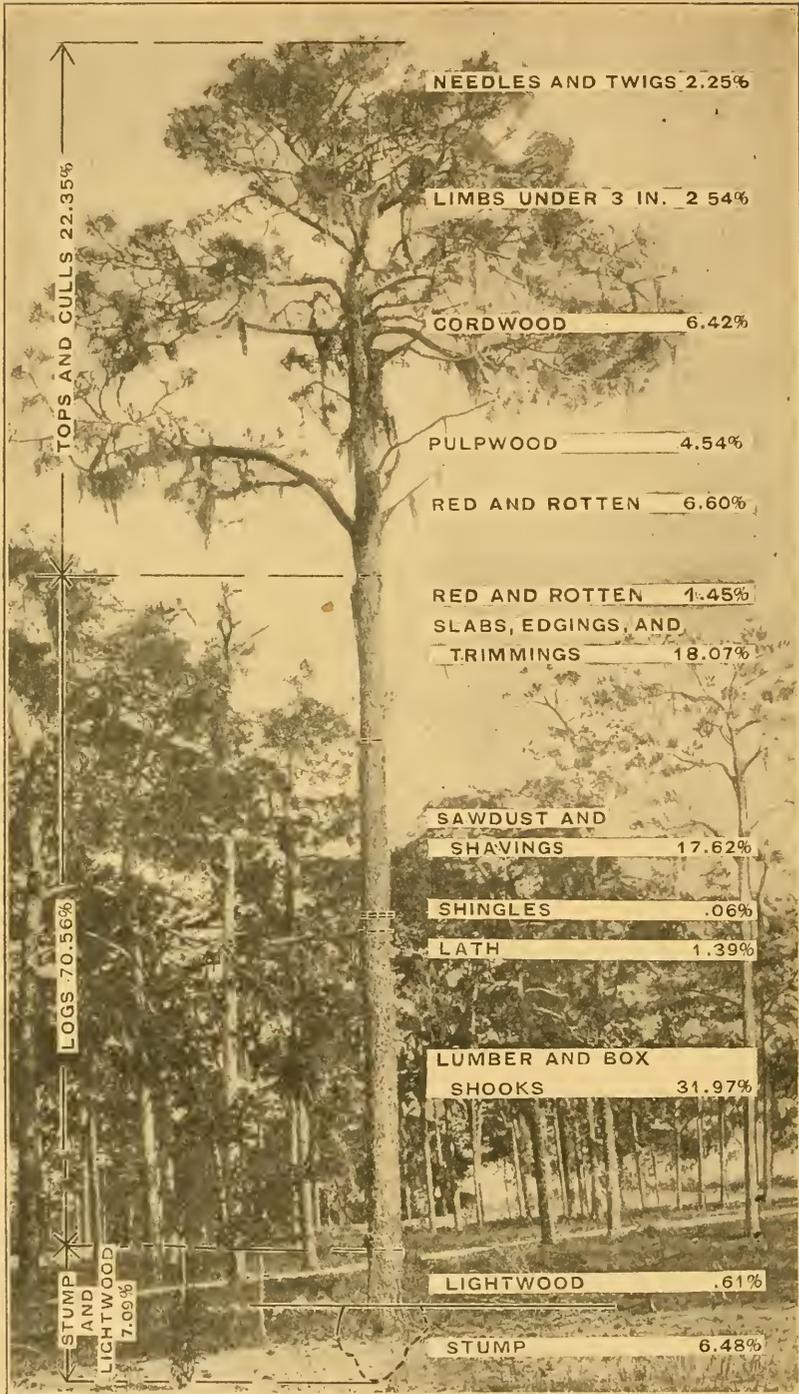
In Saxony, with 435,000 acres of forests, the loss from fire is rarely more than \$300 per annum. Wurtemberg, with 418,000 acres of forest losses about \$650 per annum. The Duchy of Baden, with 240,000 acres had only 99 acres burned in nine years. Thus, on about 1328 square miles of German forest, the loss runs about \$950 a year. Similar figures apply to other German forest areas.

Canada, of course, cannot hope to establish conditions of forest management analogous to those of Germany, and the fire hazard will long remain alarmingly high, certainly until the great peril of logging slash is thoroughly removed. But even with all allowances for our peculiar situation in which all steps towards conservation must be gauged by the likelihood of immediate profit in terms of cash, Canada's forest fire losses remain out of all proportion to our "irreducible minimum."

Farm Fertility Needs Tree Protection

Addressing the York Pioneers Club at Toronto, Mr. Charles W. Nash, an Englishman who came to Canada many years ago from the agricultural county of Sussex, gave his audience the benefit of his observations of the contrast of results obtained in conservation of fertility of the soil in Canada and Great Britain. The 40 and 45 bushel crops of wheat, which were general throughout York County when he first knew it are now the exception, he said, and he quoted Government statistics, showing that the average yield of wheat for the county in 1917 was 25 bushels, a figure which was below the average for the past 16 years, however, by eleven bushels. The average yield for the Province of Ontario was only 28 bushels of wheat and in this and

other grain crops, York County has for years exceeded the average of the province. The average yields for the county and province respectively being as follows: Oats, 16-40; Barley, 36-33; Rye, 17-16; Peas, 18-16; Corn, 50-44. As one reason for the falling off in productivity of the soil in York, and in the province in general, Mr. Nash gave the too extensive removal of the forest, an opinion in which he is endorsed by many farmers of long practical experience. Not only does this removal of the forest leave the cultivated land too greatly exposed, locally, but where the tree growth is entirely removed from the location of the source of streams the results are disastrous to a regular and sufficient supply of water through the country-side.



Messrs. Arthur D. Little, Limited, of Cambridge, Mass., who have favored the Forestry Journal with the above illustration state that two thirds of a long leaf pine tree is discarded as waste and that only one third actually becomes merchandise.

Forestry Course for Returned Soldiers

Commencing March 25, a four weeks' course in forestry for returned veterans who desire to qualify as forest guards was opened in Vancouver under the auspices of the Vocational Branch of the Military Hospitals Commission, the classes being intended to serve students from the four western provinces. It was stipulated that men enrolling should be in fairly good physical condition, have a fair education, and possess previous experience as lumbermen, loggers, trappers or ranchers. The course of instruction will cover lectures, demonstrations and field work on the subjects noted below:

1. Elementary Forest Survey—(a) Use of instruments; (b) system of land surveys; (c) mapping.

2. Forest Protection—(a) Fire prevention; (b) fire detection; (c) fire fighting; (d) fire laws.

3. Forest Management—(a) Nature of forest; (b) identification of tree species; (c) principles of administration.

The following well-known forest engineers and professors have been engaged as instructors: H. R. MacMillan, M.S.F., assistant director of aeronautical supplies, Imperial Munitions Board; Judson Clark, Ph.D., forest engineer; P. L. Lyford, forest engineer; R. D. Craig, M.S.F., district inspector, Imperial Ministry of Munitions; E. H. Finlayson, B.S.F., inspector of Dominion forest reserves, Alberta; D. R. Cameron, B.A., B.S.F., inspector of Dominion forest reserves, British Columbia; W. J. VanDusen, B.S.F., district forester; Professor MacLean, University of British Columbia; J. Davidson, University of British Columbia, and Mr. Lighthall of the B.C. University, who is also Dominion land surveyor.

A NATIONAL WARNING

Canada will pay her war debt from her productive Lands and Forests and Mines.

The Fire Fiend, who is the Kaiser's ally, is scheming to finish the Forests

first. He can't kill the Land or Mines, but the Forest is his natural prey.

Are you aiding the Fire Fiend this year? If not, put out your camp-fire, lighted match and cigarette.

Millions of acres in Canada are growing excellent timber. New industries are coming to use that timber. Thousands of workmen will be given good jobs.

But we cannot have both the industries and FOREST FIRES. One kills the other.

Forest fires are preventible. Put out your camp fire, lighted match or cigarette when in the bush.

SETTLING SOLDIERS

In many of the schemes of soldier settlement and the encouragement of immigration after the war, there appears for almost the first time some concern for the quality of the land, on which homesteading shall be permitted. We may read in this some hope that examination of soil in advance of settlement may reduce the amazing evils consequent upon indiscriminate "locating." Canadians, as a rule, have been slow to recognize that the normal, profitable crop on most non-agricultural soils is timber and that the bitterest experience a government can visit upon a farmer is to establish him in defiance of Nature's fundamental laws. One of the primary duties of the Soldiers' Settlement Board will be to guard the soldier-settler from the pitiful consequences of a bad location. If areas are hastily thrown open without thorough examination by foresters and soil experts, whose advice will be accepted as final, the efforts of the Board will prove worse than useless. It will be a matter of great interest to the Forestry Association and its members to follow the work of the Board and ascertain how far scientific guidance in the selection of lands for veterans is allowed to dominate.

The Poet's Reading of the Trees

THE HAWTHORNE-TREE

By Siegfried Sassoon

Not much to me is yonder lane
Where I go every day;
But when there's been a shower of rain
And hedge-birds whistle gay,
I know my lad that's out in France
With fearsome things to see
Would give his eyes for just one glance
At our white hawthorne-tree.

Not much to me is yonder lane
Where he so longs to tread:
But when there's been a shower of rain
I think I'll never weep again
Until I've heard he's dead.

THE STILL TREES

By John Russell McCarthy

I thank you, Elm and Beech and all my
friends
That live so wisely on the happy hills,
I thank you for your silence. Even a friend
(Especially a friend) must have his moods,
His long still days of dreaming silence spent
In strange communion with his soul and
God.

And you, my friends, have chosen for your
silence
The slow lean months of winter. All the
burdens
And all the joys of this embattled earth
You dare forget, so that your soul and God
May have their hour of studious solitude.

So I, O friends, who walk among you now,
Go searching inward to the soul in me,
And bend my dreams unto the God we
know
I thank you, Elm and Beech and all my
friends
That live so wisely on the happy hills.

THE POPLARS

By Theodosia Garrison

My poplars are like ladies trim
Each conscious of her own estate;
In costume somewhat over-prim,
In manner cordially sedate,
Like two old neighbors met to chat
Beside my garden gate.

My stately old aristocrats—
I fancy still their talk must be
Of rose preserves and Persian cats,
And lavender and Indian tea;
I wonder sometimes as I pass
If they approve of me.

I give them greeting night and morn,
I like to think they answer, too,
With that benign assurance born
When youth gives age the reverence due,
And bend their wise heads as I go
As courteous ladies do.

Long may you stand before my door,
Oh, kindly neighbors garbed in green,
And bend with rustling welcome o'er
The many friends who pass between;
And where the little children play
Look down with gracious mien.

THE LONELY TREE

By Wilfred Wilson Gibson

A twisted ash, a ragged fir,
A silver birch with leaves astir.
Men talk of forests broad and deep,
Where summer long the shadows sleep.

Tho' I love forests deep and wide,
The lone tree on the bare hillside,
The brave, wind-beaten, lonely tree
Is rooted in the heart of me.

A twisted ash, a ragged fir,
A silver birch with leaves astir.



the Forests of Finland: Scotch Pine Crown Forest at Evois, Finland, 95 years old.

Finland's Public-owned Forests

BY SAMUEL T. DANA.

**Amazingly Low Fire Losses and High
Income to State; 180 Foresters Employed.**

Finland, with a total forest area variously estimated at from one-half to two-thirds of its total land area, probably has a larger proportion of forest area than any other country in the world. Of this forest area considerably more than half is owned by the State. According to recently published official statistics the area of these State forests in 1912 was as follows:

	Per cent.	Area (acres).
Cultivated lands	5.56	174,000
Productive (dry) forest land	12.67	13,295,000
Unreclaimable swamp and marsh land	53.00	16,516,000
Water	3.77	1,176,000
	100.00	31,161,000

The small per cent. of cultivated land and the large per cent. of unreclaimable swamp and marsh land are particularly noteworthy. Of the total

area of 31,000,000 acres included in the State forests, only a little more than two-fifths consists of productive forest land, which is even less than the proportion of productive forest lands in the National Forests of the United States. The bulk of the State forests are in the northern part of Finland and consist largely of protection forests interspersed with extensive areas of barren land. In the very northernmost part of the country nearly 8,000,000 acres have been set apart as protection forest, of which only 3 per cent. is private land. Since the management of this protection forest must be particularly careful and financial returns correspondingly low, this district is left out of consideration in calculations of future incomes from the State forests.

The State forests consist mainly of land which has always belonged to the government, or in earlier times to the Crown. The policy of increasing this area by purchase was, however, adopted in 1874, and considerable areas were secured up to 1895, when the policy was abandoned. In 1906 purchases by the State were resumed, and from then to 1912, 39,809 acres were purchased for \$204,025 (\$5.13 per acre). During recent years an annual appropriation of about \$39,600 has been made for this purpose. While these purchases are small in comparison with the total area of the State forests, they are nevertheless significant as an indication of the well-established policy of Finland not only to retain forest lands already in the possession of the State, but to add to these as circumstances make it possible.

A Land of Small Trees

As would naturally be expected in a country lying as far north as Finland, the individual trees are comparatively small and slow-growing, with only a few large trees per acre. Reconnaissance estimates show that on the State forests there are approximately 141,000,000 trees of merchantable size, divided into two classes:

10 to 12 inches d.b.h., 82,629,004 trees
Over 12 inches d.b.h., 58,781,445 trees

The fact that this apparently large

number of trees does not indicate a heavy stand is evident, when it is remembered that these represent only 10.6 trees per acre of productive forest land, or 4.8 trees per acre of total forest-bearing land. The stand per acre of productive forest land varies from 486 cubic feet in parts of the extreme north to 2,002 cubic feet in the south. In general, the stand averages about 715 cubic feet per acre in northern Finland and twice as much, or 1,430 cubic feet per acre, in southern Finland. It is interesting to note that in some cases the stand on dry forest land is considerably more than on unreclaimable swamp land. This is particularly the case with Norway spruce, and is due to the fact that large areas of spruce swamp still remain untouched as a result of poor markets for the smaller-sized material.

The timber-sale business in the Finnish State forests is well developed. In 1911 forest products to the value of \$2,495,200 were sold, of which 85 per cent. was saw timber. This is a marked increase over the timber-sale receipts of \$1,401,000 in 1905, which at that time was reported to be the maximum ever received in one year. The total amount of the cut in 1912 was 86,202,000 cubic feet, or 6.43 cubic feet per acre of productive forest land. This is believed to be considerably less than the annual growth. The highest cut was, as might be expected, in the southern part of the country, where on one forest it averaged 64.35 cubic feet per acre. In comparison with the United States, it is interesting to note that the amount cut under timber sales on the National Forests in this country for the same year amounted to 431,492,000 board feet (possibly 86,300,000 cubic feet) and yielded \$942,819. It should be remembered, however, that in the United States these figures refer to stumpage value only, while in Finland most of the timber is cut by the government and sold in the form of logs.

Sale by Auction

The bulk of the sales are carried on by general auctions, at which the timber is disposed of to the highest

bidder above a certain minimum price. In 1912, 2,465,430 saw-timber trees (10 inches and over in diameter breast high) were offered for sale at such auctions, together with considerable tie material and firewood. The trees are ordinarily sold in the form of single logs, and the average price per log was 83 cents, varying from 12 cents to \$1.93. Because of low bids about 630,165 stems were left unsold. Of the material put up at auction, 76.6 per cent. was Scotch pine and 23.4 Norway spruce.

Considerable smaller saw timber, tie material, and firewood are also offered for sale at smaller local auctions. In 1912, for instance, products valued at \$229,724 were disposed of in this way. These auctions are constantly increasing in popularity and importance, as is seen from the fact that while they were held in only three of the State forests in 1904, they were held in 45 in 1912. The chief purchasers at such auctions are now sawmills, which some ten years ago had practically no interest in them.

Small Fire Losses

For so large and comparatively unsettled a forest area the extent of the fire damage is remarkably small. In 1912 only 991 acres were burned over at a loss of \$11,945 (\$12.05 per acre). This showing is particularly remarkable, when it is remembered that it is not so many years since reckless burning of the forests was the rule, and fires were frequently set in order to clear patches of land which were cultivated for a few years and then abandoned. Trespass occurred in 277 cases, but amounted to only \$1,732.

The State itself operates three sawmills. These at first were intended only for the utilization of such forest products as did not find purchasers in the general market and for the procuring of firewood for the State railways. They have, however, developed considerably, until now they are a source of more or less export material. In 1912, for instance, 2,000 standards were produced by these mills for export, and considerably

more in 1914. In addition to making possible the utilization of the more distant forests, these mills have proved of decided advantage in giving the government a clearer insight into conditions in the international timber market and a better grasp on the sawmill industry.

Public Income

The total income from the State forests in 1912 was \$2,726,853 and the net income \$1,692,039. This amounts to a net income of 12.7 cents and is certainly a creditable showing, when the poor growing conditions and comparative inaccessibility of much of the State forest areas are considered.

From 180 to 200 trained foresters are regularly employed, in addition to which there are a varying number of temporary appointments in the different forests. Technical forestry is now taught at the University of Helsingfors, where the course covers from three to four years.

WALNUT NEEDED FOR ARMY

Major E. A. Shepherd, of the Ordnance Department of the U. S. Army, has sent the following letter to lumber manufacturers:

"The Ordnance Department and the Signal Corps of the United States Army jointly request that you refrain for the duration of the war from the manufacture of veneer from walnut lumber, other than butts, crotches, or figured material, none of which walnut lumber is suitable for the manufacture of gun stocks or airplane propellers.

"The walnut lumber that enters into the manufacture of veneers, other than that above stated, is urgently needed at this time by the United States Government in the prosecution to a successful conclusion of the war which we are now waging against Germany. In other words, this lumber is a vital necessity for the manufacture of gun stocks and airplane propellers for the immediate equipment of our forces. It is requested, therefore, that you refrain from the manufacture of veneers, as stated above."

The Status of Railway Fire Protection in Canada

BY CLYDE LEAVITT

*Chief Forester, Commission of Conservation, and Chief Fire Inspector,
Railway Commission.*

From the viewpoint of fire protection, the steam railways of Canada, aggregating about 38,624 miles, may be classified under three general heads, according to their legal status:

1. Lines subject to the jurisdiction of the Board of Railway Commissioners for Canada.

2. The Government Railways System.

3. Provincially chartered railways.

Lines Subject to the Board

The first class, comprising lines subject to the Railway Commission, totals some 32,389 miles, or nearly 84 per cent of the total. These are primarily lines which hold their charters from the Dominion Government or have been declared works for the general advantage of Canada. Included in this class are such companies or systems as the Canadian Pacific, Canadian Northern, Grand Trunk, Grand Trunk Pacific, Great Northern, Kettle Valley, Algoma Central and Hudson Bay, Atlantic, Quebec and Western, Quebec Oriental, Dominion Atlantic, Edmonton, Dunvegan and British Columbia, Esquimalt and Nanaimo, Halifax and South Western, Temiscouata, and a number of smaller lines too numerous to mention here.‡

The Canadian Northern System retains its status as a corporation, and remains subject to the jurisdiction of the Railway Commission, notwithstanding that the ownership

of its stock has been acquired by the Dominion Government. Thus, it is on an entirely different basis from the Canadian Government Railways proper.

The requirements of the Board relative to fire protection, applicable to lines under its jurisdiction, are briefly as follows:

(a) Rights of way must be maintained free from all unnecessary combustible matter.

(b) Efficient spark arrestors and other fire-protective appliances must be maintained on all coal-burning locomotives.

(c) The dumping of fire, live coals and ashes upon the right of way is prohibited, unless extinguished immediately.

(d) The use of lignite as locomotive fuel is prohibited, on account of fire danger from sparks.

(e) In prairie sections, the Chief Fire Inspector prescribes the plowing of fire guards.

(f) Officers of the Fire Inspection Department are authorized to prohibit the burning of debris upon the right of way during exceptionally dry periods.

(g) The Chief Fire Inspector is authorized to prescribe the establishment of special fire patrols by railway companies through forest sections.

(h) Railway companies are required to instruct sectionmen, agents, contractors, trainmen, and other regular employees, relative to the reporting and extinguishing of fires burning upon or near the right of way. The company is made responsible for the extinguishing of all fires occurring within 300 feet of the track, unless proof shall be fur-

‡For complete list of these and other lines, revised to 1914, see *Forest Protection in Canada, 1913-1914*, pp. 10-15, published by the Commission of Conservation.

nished that such fires were not caused by the railways.

(i) Each railway company is required to submit a report to the Board with respect to every fire which burns over more than 100 square feet outside the right of way in what is classified as a forest section. These reports are checked and supplemented by reports from officers of the Fire Inspection Department.

The fire protection work of the railway companies is supervised by the field staff of the Fire Inspection Department of the Board. This staff is not a special set of men employed by the Board, but is made up of employees of the various forestry and fire-protective organizations of the Dominion and provincial governments, each such organization working within its own territory, and each such employee being appointed an officer of the Board under a co-operative arrangement established immediately following the issuance of the Board's fire regulations in 1912. This plan has for the most part worked out admirably during the six and one-half seasons it has been in effect. The railway companies have, with few exceptions, co-operated efficiently, and the fire loss, due to railway causes, has decreased to such an extent at the railways now give promise of becoming minor instead of major agencies in causing loss by forest fires. In many cases, the railways have been effective in checking fires which came in from a distance, and for the origin of which they were in no wise responsible.

Canadian Government Railways

The Canadian Government Railways total some 4,565 miles, or nearly 12 per cent. of the total for Canada. Lines included in this system are the Intercolonial, National Transcontinental, New Brunswick, and Prince Edward Island, International of New Brunswick, Prince Edward Island, St. John Valley, Quebec and Saguenay, Elgin and Havelock, Moncton and Buctouche, St. Martins, York and Carleton,

and Salisbury and Albert. The acquisition of the last named line is effective July 1, and of the four preceding, June 1. Negotiations are still under way for the purchase of the Kent Northern and Caraquet and Gulf Shore, under recent legislation.

The Hudson Bay Railway, extending northeasterly from Pas, Manitoba, is still in the construction stage and is being operated by the contractors.

The question of fire protection along Government Railways has been a live issue for many years. In former years there was much criticism, and the matter has been subject of repeated representations by the Conservation Commission, Forestry Association, provincial governments, timber owners, and forest protective associations. The Department of Railways and Canals, which has the administration of these lines, has repeatedly pledged itself to the adoption of the same standards relative to fire protection as are in effect on lines under the jurisdiction of the Railway Commission.

Great improvement has unquestionably taken place during recent years. However, there seems only too good reasons, for the opinion that this work has not yet uniformly reached the standard set by the Board's regulations for lines under its jurisdiction. It is believed that so far as this deficiency exists, it is due rather to lack of special organization involving specialized overhead supervision and inspection, rather than to any lack of intent on the part of officials to maintain a uniformly high standard in the work of fire prevention and control. The usefulness of local specialized inspection in bringing about improved conditions with reference to fire prevention and control along Dominion chartered railways has been conclusively demonstrated through the Fire Inspection Department of the Railway Commission. This is quite natural, since railway employees, especially when there is a shortage of labor, may be expected to pay most attention to

work, failure to perform which would be most likely to cause them trouble. In this way, fire protection is likely to suffer unless some specialized inspection is provided to see that it gets its reasonably fair share of attention. The provision of such inspection by the Railway Commission has unquestionably supplemented to a very valuable degree, the ordinary supervision by railway officials, on Dominion chartered lines. There is, however, no legal provision for such outside or supplementary inspection, so far as the Government Railways are concerned.

To a certain extent, this deficiency has been overcome through the expenditure of money by private and provincial government agencies, co-operating with the Government Railways management. Failing adequate action by the Dominion Government, which should have set the pace for the privately-owned lines, instead of the reverse, it became imperative that limit-holders and provincial governments in eastern Canada should protect their valuable timber properties by themselves undertaking work, very largely at their own expense, which privately owned lines are required by the Dominion Government (through the Railway Commission) to perform without cost to timber owners and provincial governments. The inconsistency and unfairness of this attitude on the part of the Dominion Government are, of course, perfectly obvious.

Thus, we see, in Ontario, the provincial Forestry Branch maintaining fire patrols along the Transcontinental, only one-third of the cost being reimbursed by the Department of Railways and Canals. There is no provision for an outside inspection of fire-protective appliances on engines, which has proven itself so valuable on private lines in preventing the occurrence of fires. The report of the Provincial Forester for 1917 states that 60 per cent. of the railway fires in the province during that year occurred along the Transcontinental, where the worst conditions exist. This proportion is twice to three times as high as it

should be, considering the total mileage of other lines.

In Quebec, the situation is very much the same. On the Transcontinental west of Parent, a special patrol is maintained by the Forest Service. East of Parent the patrol north of the St. Lawrence is maintained by the St. Maurice Forest Protective Association, and on the south shore by the Southern St. Lawrence Forest Protective Association. The Dominion Government pays one-third the salaries of the fire rangers on this railway patrol, the balance being borne by the associations and the Provincial Government jointly. The Government Railways management also furnishes gasoline and oil for the power speeders used on this patrol, co-operates in keeping the speeders in repair and maintains a fire-fighting tank car at Monk station.

In New Brunswick, the provincial Forest Service maintains a power speeder patrol through Forest sections along the Transcontinental and International railways, the Government Railways management paying one-third the salaries of the fire rangers in question, and co-operating along much the same lines described above. In this province, a special inspector of fire protective appliances on engines is given qualified inspectors of the provincial Forest Service. In this respect, developments here are in advance of those in Ontario and Quebec.

It is, of course, understood that the Government Railways management issues the usual standard instructions to section men and other regular employees relative to extinguishing fires, and also that the special patrols above referred to are regarded as necessary to supplement whatever the section forces may be able to do in this direction.

In Nova Scotia, so far as known, there are no special co-operative arrangements, the railway and the province each handling its own fire protective work independently.

In Manitoba we have both extremes. On the Transcontinental, between Elma and the Ontario boundary, the Government Railways main-

tain a special power speeder patrol wholly at its own cost, permitting co-operative inspection of fire protection work by the Dominion Forestry Branch. On the Hudson Bay Railway, on the other hand, the necessary special patrol is maintained wholly at the expense of the Dominion Forestry Branch. This again exemplifies the inconsistency and unfairness of the existing fire protection situation on the Government Railways.

This whole matter, however, now bids fair to be straightened out in due course. At the 1917 session of Parliament, an amendment to the Government Railways Act passed the House, providing for placing the Government Railways under the jurisdiction of the Railway Commission with relation to matters in general, including fire protection. This bill, however, failed to receive consideration in the Senate, because it was contingent upon the enactment of the consolidation and revision of the General Railway Act (defining the jurisdiction of the Railway Commission as to privately-owned lines), which bill failed of consideration in the Senate at that session. During the 1918 session, the House and Senate failed to agree as to amendments to the consolidation and revision of the General Railway Act, and the question was not raised of amending the Government Railways Act to give the Board jurisdiction over the Government Railways. This matter has been strongly urged on grounds other than fire protection, and very likely will come up again.

More recently, the suggestion has been advanced that possibly the Government Railways might be amalgamated with the Canadian Northern and with other lines which the Government is considering taking over, including the Grand Trunk and the Grand Trunk Pacific; all to be managed as one system, on what would be practically a corporate basis, by a Board of Directors to be selected by the Government, presumably much along the lines already announced with reference to

the proposed management of the Canadian Northern System, the stock of which is now owned by the Dominion Government. Should this action be taken, and should the greatly enlarged Government Railways System be made subject to the jurisdiction of the Board of Railway Commissioners, as the Canadian Northern, Grand Trunk and Grand Trunk Pacific are now subject, the question of fire protection would automatically become solved, through the application, to what now comprises the Government Railways System, of the same regulations which are now applicable to the other lines over which the Board now has jurisdiction.

Provincially Chartered Railways

Fire protection upon provincially chartered railways has very largely ceased to be a serious problem, except in the province of Alberta. Here we have the Alberta Great Waterways and the Canada Central railways, still in the construction stage and aggregating some 350 miles of track. The Dominion Government has no jurisdiction over such railways, except as to lines in forest reserves, and there is no provision in the provincial legislation for the enforced adoption of preventive measures. Consequently, the Dominion Forestry Branch is left to take what measures it sees fit, at its own expense, supplemented by whatever action the Companies may see fit to take voluntarily. The Commission of Conservation, the Canadian Forestry Association and the Department of the Interior have made urgent representations to the Alberta Government to have this condition corrected, on a basis consistent with what is being done elsewhere.

In British Columbia, the provincial Forest Service has practically the same authority as to fire protection on provincial railways that the Railway Commission has as to Dominion chartered lines. Only small and relatively unimportant lines come under this category. The Pacific Great Eastern has now been taken over by the province.

In Ontario, similarly, the mileage of provincially chartered railways is small, and the legislative provision for their control is adequate, being administered by the Forestry Branch Department of Lands, Forests and Mines. The Temiskaming and Northern Ontario Railway has much the same status provincially that the Canadian Government Railways have from a Dominion viewpoint, being owned by the province and operated by a commission. This commission reimburses the Department of lands, Forests and Mines for one-half the cost of the special fire patrol maintained along this railway by the Forestry Branch.

In Quebec, the only provincially chartered railway of any consequence from fire protection viewpoint is the Quebec Central. The Quebec Public Utilities Commission has fire regulations parallel to those of the Dominion Railway Commission, and the Provincial Forester acts as an officer of this Commission in enforcing these regulations.

In New Brunswick, the recent absorption of several small lines into the Government Railways system has very nearly removed the problem of provincial railways from further consideration. However, a few small and unimportant lines remain, and fire protection on such is thoroughly provided for under the new Forest Fires Act of 1918, which is administered by the Provincial Forester.

Nova Scotia has of provincially chartered railways only the Cape Breton, Sydney and Louisburg, and Maritime Railway, Coal and Power Co. Provincial legislation is adequate as to fire protective appliances on locomotives and as to right of way clearing. There does not, however, appear to be provision for enforced patrol by railway companies or fixing responsibility on railways for extinguishing fires due to railway causes.

Prince Edward Island, Saskatchewan and Manitoba have no provincially chartered railways in operation.



Clearing Land Without Destroying Adjacent Timber

The lower picture shows the slash resulting from clearing operations, the upper the same area after the slash has been burned under permit from the Ontario Forestry Branch. Precautions were taken which have preserved from destruction the adjoining valuable pulpwood forest. At present prices for pulpwood, settlers in forest sections possess an extremely valuable resource in the timber on their lands.



MOUNT LEFROY, LAKE LOUISE.

War Record of Dr. Fernow's Students

The Faculty of Forestry (Dr. B. E. Fernow, Dean) during the past session has managed to "carry on" with the teaching staff reduced by about 50 per cent, and the enrolment of students to the same number as the previous year, namely ten, four of them in the fourth year, all unfit for military service, and five in the first year, too young for enlistment until the end of the session, when two of them had reached the proper age.

Professor W. N. Millar of the staff, being a citizen of the United States, enlisted immediately after the declaration of war by that country, joined the tenth Engineers (Forest) Battalion as captain, and is in France directing a logging operation. Prof.

J. H. White of the staff has accepted employment with the provincial government as assistant to Mr. Zavitz, Provincial Forester, with leave to continue his lecture work in part. A thorough re-organization of the fire protective service has been the main work of his department. Dr. Howe of the staff continues this summer his investigation for the Commission of Conservation into the reproduction of cut-over pulpwood lands and is also superintending the establishment of permanent sample plots on which the development of young tree crops, rate of growth, etc., can be studied in detail from period to period. In this work several of the students are employed.

Another set of students is employed



CATHEDRAL PEAK, YOH0.

under the Dominion Forestry Branch in the survey of the Petawawa military reservation, which is to be used as a forest experiment station. This party is under the immediate direction of Mr. R. A. Courtnage, one of this year's graduates. Mr. Courtnage enlisted at the beginning of the war in the aviation corps, but while flying in England came to grief in a collision and broke both legs. Apparently the fractures have been so successfully healed that no difficulties are experienced in the field work.

Among the men returned from the front, we should mention Mr. E. G. McDougall (B. Sc. F. '11), who unfortunately lost one leg, but who has found acceptable employment in

the Weather Bureau. Capt. A. E. Parlow (B. Sc. F. '13), who has been three years at the front and has been wounded several times, has returned honorably discharged, to assume his work with the Dominion Forestry Branch in British Columbia. Several other men have returned but are not yet physically in condition to take up the work of their chosen profession.

It might be supposed that the majority of forestry students had enlisted in the forestry battalions, but this is not the case. Out of the 80 men at one time enrolled in the Faculty, who are enlisted, 31 being graduates, only 13 are to be found in these battalions. Two of our students, one a graduate, have at-

tained to the position of major, five to that of captain, and 43 to that of lieutenant. Eighteen have been wounded, gassed, or otherwise incapacitated. Six have been decorated with the military cross or medal, three mentioned for bravery, and the following have given their life for their country;

James Douglas Aiken, graduate 1916.

Charles Laidlaw Anderson, 1918.

George Edward Bothwell, graduate 1913.

Robert Alexander Rankine Campbell, 1915.

Albert Edward Cuzner, 1918.

James Russell Chamberlin, graduate 1914.

Kenneth Brown Downie, 1918.

Harold Sylvester Edmonds, 1918.

Alister Munro MacKenzie, 1913.

Ronald Mackenzie Richards, 1916.

Frederic Gustavus Stupart, 1918.

Arnold Monroe Thurston, 1916.

John Archibald Trebilcock, graduate 1915.

The work of the Faculty is to be kept up through the coming session as usual, and a number of discharged soldiers expect to enrol. Meanwhile, the Khaki University also proposes to start forestry courses in London, preparing for entrance into the Faculty.

THE POWER OF PRODUCING WEALTH

The power of producing wealth is therefore infinitely more important than wealth itself; it insures not only the possession and the increase of what has been gained, but also the replacement of what has been lost. This is still more the case with entire nations (who cannot live out of mere rentals) than with private individuals. Germany has been devastated in every century by pestilence, by famine, or by civil or foreign wars; she has, nevertheless, always retained a great portion of her powers of produc-

tion, and has thus quickly re-attained some degree of prosperity.—

(*"Foundations of National Prosperity"*)

Dr. Felix Regnault entertains the view that the decadence of Greece, Rome, Spain and Italy has been due primarily to a failure to practice conservation.

AIRPLANES FOR B. C.?

The feasibility of the airplane for forest fire patrol work is regarded as plausible by Hon. T. D. Pattullo, provincial minister of lands.

His opinion regarding advantages which should be derived from the inauguration of such service was expressed in conversation and an air service veteran who returned after being wounded six times, furnished him the inspiration. Such returned flying men, thought the minister, would prove invaluable to the governmental forestry branch for patrol work along the British Columbia coast areas. The distance they could cover in a day's run would aggregate more than that of three or four mounted patrolmen on terra firma, while observation from the air over forest areas would have manifold advantages over observations taken from the ground.

HOW TO PREVENT FOREST FIRES

Never leave camp with your camp-fire burning.

Never drop lighted matches or tobacco in the woods.

Never clear land by fire in very hot weather.

Try taking these precautions this year only.

You'll do the same next year by habit.

The Management of Woodlots

G. C. PICHE, CHIEF OF FOREST SERVICE, QUEBEC.

Recognizing the gradual diminution in merchantable timber, and even in certain places, of firewood, it becomes more and more evident that it is necessary to take proper precautions for managing the forest property in a systematic fashion. The Provincial Government, controlling the greater part of our forests, has established very suitable regulations, whose execution is supervised by the members of the Forest Service. However, a certain very important part of our forest domain escapes this control. I speak here of the woodlots or private woodlands which are distributed through all the province, in all the villages, and which constitute an important part of the inheritance of our farmers.

I should say here that many of our woodlots are very well managed, and could not be handled in a better way. Consequently, the remarks which follow do not apply to these good foresters, but to those who have not heretofore considered the woodlots in a serious manner.

The proper management should be carried out so as to remove only the annual crop, that is to say, an amount of wood equal to that produced by the woodlot during the year. If one cuts more than the yearly production, what the foresters call the "increment," there results a gradual reduction of the forest capital. It is necessary to understand that often owners of woodlots are obliged to make heavy cuttings, for instance when one wishes to construct a building or to realize a certain sum of money which he requires; but with proper organization one foresees such a necessity and, instead of removing each year all the crop of wood, a certain portion is left in reserve. Just as is done in properly managed financial institutions, such as banks, the proprietor of a wood lot ought to

establish a reserve fund by economies made each year. A second point to observe is to direct the cutting towards the trees which have practically reached full growth. If we consider the tree as a capital, yielding each year a certain percentage of interest, we should remove the tree when its percentage of interest, that is to say, the annual increase, falls too much below the mean, and replace it by a younger and more vigorous tree. Trees injured by storms or lightning should also be cut out each year so as to obtain all the benefit the wood can give before it deteriorates by rot. Also, those that are attacked by insects or fungi are equally exposed to destruction and ought to be removed without delay; finally, when fire sweeps over a portion of the woodlot it is necessary to hasten the removal of the injured trees.

It is evident that there is really very little extra trouble in managing a wood lot properly so that it can give the proprietor a fair revenue. Naturally, if there are places bare of trees it is of the greatest importance to plant them with suitable species, and for this purpose one can obtain from the nursery at Berthierville, Qué., all the plants desired under advantageous conditions, for the Provincial Government takes great interest in the question of reforestation. The Hon. Mr. Allard, Minister of Lands and Forests, will be very pleased to see all the forest owners cover the clearings in their woodlots with judicious plantations, that is to say, with species appropriate to the local conditions. He would be glad to have all those who need advice write to the Chief of the Forest Service, Quebec, explaining to him the conditions obtaining in their woodlots, whose management they wish properly organized; the Government Forest Engineers will then furnish freely the necessary advice on the management

of the plantation so as to improve and perpetuate the property.

The Forest Service can assist the forest owners in the following ways:

1. In preparing a plan of management of the woodlot.
2. In furnishing at the ordinary price the necessary plants for filling the clearings in the property.
3. In indicating the methods of cultivating the most profitable species of trees for the woodlot.

When it becomes necessary to examine the woodlot the conditions will be as follows:

The Forest Service will pay the salary of an expert who is appointed to make the examination; but the forest owner will defray the expenses of board and transportation, the

estimated amount of which should be forwarded in making the application, so as to avoid misunderstandings.

It would be preferable for several neighboring owners to unite so as to reduce the individual expenses; and from the standpoint of the Forest Service this will be very helpful, for we have only a small number of forest engineers at our disposition, and consequently, cannot send them everywhere.

We hope that those interested will study this question seriously, since it is greatly to their advantage, and that they will profit by the assistance so generously offered by the Provincial Government, thereby increasing the interest from their property and, consequently, their income.

Digging Wealth from Buried Trees

Forests of New Zealand which flourished and died so many ages ago that the ground they covered is now swamp and plain, are yielding more than a million dollars a year to Maori natives and whites who dig kauri gum, the undecaying resin of the prehistoric trees.

Nearly \$100,000,000 worth has been gathered in the last half century and an equal amount remains to be dug. From two to 12 feet under the surface of the earth the resin lies, in strata which show that three successive forests matured and died in the creation of the deposit which is used by manufacturers of linoleum and varnish in the United States and Great Britain.

The trees of the kauri forests of today furnish the most valuable wood of New Zealand for general building purposes. The tree is a giant of the bush that ranks with the cedars and firs of Northwestern America in girth but not in height. The diameter runs from four to 12 feet, with specimens that have measured 15 and even 20 feet. The height averages 80 to 100 feet, with a maximum of 150 feet.

Cover Old Forests

The great gum deposits are not

found in the forests of the present day but on fern-covered hills, plains and swamps. In some instances the buried forests flourished so many ages ago that no trace of them remains except the hundreds of millions of pounds of resinous exudations.

The gum fields are principally in the provincial district of Auckland in the northern part of the North Island, covering about 1,800,000 acres. At one time kauri gum was so abundant that it was dug out with little trouble near the surface, but half a century's industrious digging has diminished the supply until now it is necessary to go down several feet for it. In some cases the excavations go to a depth of a dozen feet, and recently companies have begun operating with converted gold dredges.

Brings \$1500 a Ton

The gum, as it is found, varies from the diameter of a marble to lumps weighing 100 pounds or more. In color it ranges from pale lemon yellow and reddish brown to almost black. Much of it is transparent or semi-transparent. Its grades for market purposes are as varied as its coloring. The most valuable deposits are found in dry soil and the best grades bring as much as \$1500 a ton,

while specimens varying in color from light amber to brandy, no larger than a teacup, have sold for \$100.

The swamps yield the dark colored resin, which is cheap. The average value of all the gum is about \$300 a ton. In 1913, when 9596 tons were produced and 8780 tons exported, the average value of the exported article was \$315 a ton, a dozen times its worth when its export to the United States began in the early sixties.

Better grades of the gum are used as a substitute for amber in the manufacture of mouth-pieces for cigar holders and pipes. The great bulk of it is used in making oil varnishes and linoleum. The most recent use is believed to have been in the manufacture of explosives by the Germans, who are known to have bought thousands of tons of it in the years preceding the declaration of war in 1914.

Equipment is Simple

The digger's equipment usually is a light pointed iron rod which is used to test the ground, and a spade. Many diggers, however, notably a large number of Austrians who have gone to New Zealand expressly to gather kauri gum, do not use the spear but turn the soil completely over with a spade. As a rule they work in gangs of 20 to 30, passing the winter on the highland and the summer in the swamps and lowlands. They work long hours in the fields and other hours night and morning scrapping gum in their camps.

The earnings of the gum digger vary greatly. Some earn from \$3 to \$5 a day; others make as much as \$40 or \$50 in a week, but the higher figures are not realized long. In exceptional cases diggers have secured \$250 worth of gum in six weeks or a few Maoris have obtained half a ton in a week from a small patch.

Including Maoris and aliens, principally Austrians, gum digging has employed 10,000 persons at a time, although, as many of these are youthful or aged natives, the labor was equivalent to 7000 able-bodied persons. Many of the Austrians were recalled to their native country prior

to the war. Those who remained petitioned Premier Massey to be sent as soldiers in the Allied cause, but their petitions were refused.

Gum digging is a standing resource for the industrious unemployed in New Zealand and has enabled Auckland to tide over periods of serious commercial depression with comparatively little difficulty. It has also been of vast benefit to hundreds of settlers with small capital.

Kauri Forests

Valuable kauri forests of the present day have been burned purposely to make way for settlement, against the advice of forestry experts that it would have been better to have kept the area as national or state forests. Kauri timber is nearly vanished from the islands.

It is stated that kauri timber burned in the Puhipuhi forest would have had a value of £3,000,000 had it been worked into lumber. As late as 12 years ago it was reported that there were 160,000 acres of kauri forest standing in its natural state. Most of this has been burned to do away with alleged fire hazard and to clear land, and kauri timber has doubled in price in the last 15 years.

Besides these direct losses, New Zealand is suffering from the squandering of some of its most beautiful scenery because of the destruction of the forests.

RANGERS MUST REGISTER

Toronto, June 10.—Unless representations that are being made to the authorities at Ottawa, by the Department of Lands, Forests and Mines are successful, vast stretches of Northern Ontario are going to be left unpatrolled by fire rangers for several days, because of national registration on June 22. The regulations declare that each man must personally register at the headquarters of the registrar for the area, which would mean that all the fire rangers would have to leave their posts and journey to the registration point. Some of the men would have to be away several days to make the return journey to the headquarters.

The Tragedy of Cross Forks

BY SAMUEL T. DANA, U. S. FOREST SERVICE.

The effects of forest devastation on community development are seen most clearly in the smaller towns in the regions primarily adapted to timber production. Here deserted villages are signposts that too often mark the trail of lumbering operations. As in the mining regions of the West, towns spring up almost overnight, flourish for a few years, until the adjacent timber is cut out, and then sink rapidly to inactivity or even complete extinction. Unlike mining towns, however, there is not the same necessity for their disappearance. Timber is a renewable resource, which can be so handled as to insure continuity of cut and therefore of industry.

In the mountain counties of Pennsylvania, particularly in the northern part of the State, one comes upon town after town that has declined with the passing of the forest. Run down and deserted houses still standing give an idea of the towns' former prosperity. Six and eight room frame houses with up to half an acre of land can be bought for from \$200 to \$400.

Most striking of all, perhaps, is the rise and fall of Cross Fork, in the hills of southeastern Potter County. In the fall of 1893, before lumbering operations started, perhaps five or six families were living on the site where two years later stood a busy town. For some 14 years Cross Fork led a feverish existence while the forest wealth was stripped from the surrounding hills. The life of the town was, of course, the big sawmill, which had a daily capacity of 230,000 board feet and was up to date in every respect. In 1897 a stove mill was established also, and various other minor wood-using industries existed at different times. In its prime, Cross Fork had a population of 2,000 or more and was generally known as one of the liveliest, most hustling places in the State. A branch line of the Buffalo and Susquehanna Railroad was built to the town. Stores of all kinds flourished. There were seven hotels, four churches, a Y. M. C. A. with baths and gymnasium, a large, up-to-date high school, two systems of waterworks, and two electric light systems.

But the prosperity of the town was as short-lived as the timber supply. In the spring of 1909 the big sawmill shut down for good. From then on the population dwindled rapidly. Fires became so frequent that the insurance companies canceled their policies. Five-room frame houses with bath were offered for sale for from \$25 to \$35 without finding a buyer. In the winter of 1912-13 the stove mill also ceased operations, and the next fall railroad service, which for sometime had been limited to three trains a week, stopped altogether. To-day the total population consists of but 60 persons. If it had not been for the State, which bought up the cut-over lands and has undertaken in earnest the work of reconstruction, the town would be as desolate as the surrounding hills. As it is, Cross Fork is now a quiet little hamlet, the merest shadow of its former self and without hope for an industrial and useful future until the timber grows again.

The cut-over lands of the Lake States tell the same story of temporary prosperity characterized by the rise and fall of mushroom towns. Immense tracts of little value for anything except timber production have been left dotted with deserted villages as the lumber industry devastated them and swept on. Meredith, for example, was once a prosperous town in the north-eastern corner of Clare County, Mich., for which one looks in vain on any modern map. To-day its hotels are in ruins, the town hall has been moved elsewhere, the railroad which connected it with the outside world has been torn up, and its population has dwindled from 500 to 3.

War and The Birds

BY N. TOURNEUR, THUNDERSLEY, ENGLAND.

Certain wild things, as a rule, seem unfrightened and wholly undisturbed by the long spells of the tremendously heavy gun-fire on the Western Front. It is singular to note that, though the birds there may be silenced by a thunder-storm they sing continuously through the deafening roar of a heavy bombardment of the trenches. The lark rises singing between the lines, and the wren plays among the brambles, despite the thundering of the guns.

When, as in the Forest of Argonne, one leaves the more leafy soil of the surface path for the mud of a communication trench,—and surroundings where trees and undergrowth have suffered more severely, and where one can only set his foot at the risk of his life,—plant, insect, and bird life again go on undisturbed. It is, as it were, as if war with all its appalling turmoil had now become so familiar to the kingdom of birds and wild animals that it had lost its power to frighten.

During the winter and spring of 1914 and 1915, however, wild animals of all kinds, scared by the heavy cannon and rifle firing, fled from Germany and parts of Austria, and entered the Swiss forests and the Alps. They included wild boars, deer of several kinds, goats, etc., as well as innumerable wild fowl; and, in the Lower Engadine, even bears entered the Swiss Yellowstone Park, as it is termed. The lakes and rivers of Switzerland were crowded by the denizens of the air and the marshes, and fowlers were busy, till shooting was prohibited by the Swiss authorities, and sharp imprisonment instead of fines dealt out to offenders against the law. The strangers were then allowed to have a rest in peace and comfort before continuing their journey southward to warmer climes.

There is no doubt whatever it was the war that frightened the animals

and birds from their accustomed haunts, and crowded the Swiss lakes and forests. A large number of wild bears from the Black Forest entered the Jura Alps, across Alsace and Lorraine, and in passing through the fighting armies were noticed by many of the scouts and other soldiers.

Use and wont, however, prevail in wild life, even as they do in human Deer again feed in the glades of the Forest of Argonne, despite the hurricane of shells that may fall but a few miles away, till everything green disappears, shredded and pulverized, into the torn earth, and only stumps of trees are left protesting mutely against the folly of man. And, here, too, in the Forest of Argonne, an officer taking his morning ride may come upon the magnificent wild boars still frequenting the lonely thickets.

It may be probable, though, that this long period of great hostilities is influencing bird life in another and more remarkable way. The roar of the heavy artillery may possibly have diverted or retarded the movements of birds on their migratory course. And a curious effect has been noticed in the Midlands of England, and elsewhere: every year since the war began, the swallows and martins and other migrants are loath, very loath, to leave.

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

The Fight to Save Our White Pine

BY PROF. J. H. FAULL, PH.D., UNIVERSITY OF TORONTO.

Northern Ontario and Western Canada Must be Guarded Against Deadly Menace of Blister Rust.

The terrific destruction wrought by introduced fungi and insects has been demonstrated too often to allow us to supinely take a chance with White Pine Blister Rust. It has been recently estimated that the United States alone suffers losses of at least \$500,000,000 annually from imported pests. Two or three examples will suffice. The potato blight was brought into Ireland in the middle forties; two years of its ravages served to cut the population of Ireland into two by deaths from famine and by emigration; its effects even reached America, and the Irish political domination in New York and other places along the Atlantic seaboard today is to be traced back to the immigrations of that period. The American grape mildew gained a foothold in France about 1850. The result was disastrous, the yield being reduced to one-tenth or one-twentieth of the normal, ruining growers, causing migration, and necessitating a radical change in cultural methods. The latest instance is that of the chestnut blight, a disease introduced from central China on stock of the Chinese chestnut; starting from New York city in 1904, it has swept relentlessly to the northern limits of the chestnut forests, to the west as far as western Pennsylvania, and south into the Virginias and Tennessee, over wide stretches destroying 100 per cent. of the chestnut of all ages, resulting in a loss that two or three years ago was variously estimated up to \$100,000,000; the calculations of foresters for reforestation throughout the chestnut zone have been completely upset; the value of the chestnut as a basic forest tree has vanished. The fungus that causes the blight we now know occurred only in China on Chinese

chestnut, which is so resistant that comparatively little damage results. Up to 1904 the fungus was not known to science and was apparently restricted in its distribution to China. It is a striking example of the increased virulence exhibited by many parasites when transferred to a new species or variety of host.

Blocking New Diseases

Passing around the circle we find our optimists linked with the equally dangerous fatalistic pessimists, who, too, would pursue a *laissez faire* policy. They argue that wherever there is commercial intercourse the maladies will follow the traders' flag, and that in spite of our best efforts, in time plant pests of every kind will spread to all parts of the civilized world, limited only by the existence of unfavorable natural conditions. They are wrong, for, just as many diseases of man have been prevented from gaining a foothold in Canada and the United States, such as bubonic plague and leprosy, so too, there are hundreds of plant diseases, like European potato canker and the root knot of alfalfa that have not been allowed to establish themselves on the American mainland. Speaking for the Department of Agriculture of the United States, one of their leading plant pathologists remarks: "The securing of these diverse species and varieties of plants from all quarters of the world, however, is always accompanied by the danger of introducing foreign diseases of these plants along with the plants themselves. A special inspection is maintained for the purpose of preventing the introduction of such diseases, and it is not overstating the truth to say that dozens of dangerous new diseases are intercepted every year."

These pessimists are likewise wrong when they advocate that a disease may just as well be allowed to run its course once it has gained entrance, that to make expenditures on control or eradication measures is throwing good money after bad. That doctrine is vicious. There are many, many cases in which effective economic control and preventive measures have been devised, which, when applied, reduce staggering losses almost to the vanishing point, as with yellow fever in man, and with various smuts, mildews and rusts among plants. It is true that the chestnut blight appears to have passed beyond control but it came like a bolt from a clear sky; it was here and probably already beyond control before we even knew of the existence of the fungus that causes it; certain it is that during the two years spent in becoming acquainted with its mode of reproduction, of dissemination and attack the case had become hopeless. In its newness to botanists, in its lightning spread, and its quickness and completeness of destruction, the chestnut blight organism stands unique certainly among tree-destroying fungi. But the case of the blister rust of the pine is different. We have long known this pine rust and the vital features of its life history, so that it is not necessary to defer action pending the discovery of further scientific data.

Control and Prevention

I have pointed out that we have the blister rust of the pine with us—it is spread practically throughout all the well settled part of Southern Ontario and probably Quebec. I have produced evidence to show that it is a dangerous menace, and I have taken the ground that an active campaign should be waged against it. But what action?

1. The prime necessity in the blister rust situation is **action**, and our best energies should be directed towards **eradication** and **control**, we possess the knowledge essential to those ends. Further research will add new data of value, and so must be provided for, but the foundation principles governing the course of

action to be pursued are in hand.

2. A study of the history of this disease in America attaches the full blame for its introduction to the imported white pine stock, and it likewise reveals the fact that the disease occurs in the nurseries or forests of Russia, Germany, Austria, Denmark, Holland, Belgium, France, England, and now the United States, Ontario and Quebec. Therefore, an absolute embargo must be maintained against importations of white pine nursery stock from Europe and the United States, and provision should be made to enable Ontario and Quebec to maintain a complete quarantine against such provinces as may be deemed necessary, and to regulate the movement of nursery stock within their own limits. As other 5-needled pines are likewise susceptible to blister rust (the mountain pine of the West, *Pinus monticola* for example, being even more so than *P. strobus*), the embargo must embrace all 5-needled pines.

Fumigation Useless

It may be pointed out here that fumigation of stocks affected with blister rust is perfectly useless, and inspection at the dock is valueless. This is an example of a disease that can be passed on only by an expert. Looking back over the past, it cannot but be regretted that the services of expert plant pathologists have not been sooner requisitioned. The Dominion government, for instance, took no steps in this direction prior to 1909, and even yet the service is undeveloped and handicapped.

3. Blister rust has not yet been found in the forests of British Columbia, and Alberta. Therefore, a quarantine against the entrance of nursery stock of 5-needled pines should be thrown around those provinces. It would seem desirable, too, that some scouting should be done in them, especially along the transcontinental highways and in the fruit-growing districts.

To Plant White Pine?

4. It is very questionable if the planting of white pine should be con-

tinued in Eastern Canada. This is a serious blow at what has been a prime and perfectly sound principle in the practice and plans of forestry in America. The first and most valuable choice of trees for reforestation purposes is removed from the list. At all events, to plant white pine in Eastern Canada is almost certain to bring loss and disappointment and with that a lowering of the planting enthusiasm.

If we can keep the disease out of northern Ontario and Quebec, white pine could be safely planted there only if it were obtained from stock grown in the North or West.

5. Whether or not white pine plantations, of which there are several in Canada, should be annually inspected or eradicated, should be determined entirely by the circumstances of the case. Where eradication is effected it would seem desirable that the government should replant with other species of trees.

6. There is no evidence yet, so far as I know, that the blister rust has been carried to America in European

currant or gooseberry stocks. Yet there is a possibility that it could be, and as long as that uncertainty prevails, these stocks should be placed under the same embargo conditions as the pine.

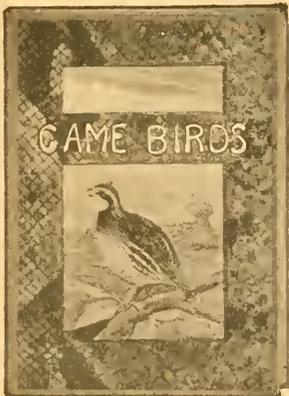
Guarding the West

7. There is absolutely no question in my mind but that the various cultivated varieties of Ribes, and especially black and red currants, are the most potent agencies in the spread of the blister rust. There is a free and extensive movement of these commodities throughout Ontario and the other eastern provinces, and the disease is very readily spread from these plants to others of their own kind as well as to the pine. It is equally certain that the disease can be spread to the West in the same way. This opens up one of the difficult features in the situation, the only solution of which lies in an embargo for the present on the shipment of currants and gooseberries into Northern Ontario and into Western Canada except through the Minister of Lands,

How many North American Game Birds Can You Name?

Can You describe twenty-one kinds of ducks—six kinds of geese?

If not, there is a good time awaiting you in a copy of "Game Birds." and by a piece of good luck the price is just 50 cts. post free.



A splendid little book of 64 pages, 5 x 7 inches, made up of heavy coated paper throughout.

Forty-nine of the best illustrations in life-like natural colors you ever saw—really a beautiful piece of quadri-color printing. Decorated board covers.

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

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

FIFTY CENTS A COPY, POST FREE.

(STAMPS OR MONEY ORDER)

CANADIAN FORESTRY JOURNAL
206-207 Booth Building, Ottawa.

Forests and Mines. Similar action should be taken in Quebec, with the River St. Lawrence as the base line.

It will be of interest here to note some of the quarantines now in force against the white pine blister rust.

specimens similar to the cut. So widely spread is the disease in Southern Ontario that immediate eradication is out of the question. Indeed, we may as well accustom ourselves to the thought that the rust is pro-

Area	White Pines	Ribes	Quarantined Area
Canada	All	None	All foreign countries: Europe and Asia, New England and New York are quarantined as regards black currant.
United States	"	All	
California	"	"	East of Mississippi River.
Delaware	"	"	All points outside State.
Indiana	"	"	All points outside State.
Kansas	"	"	All points outside State.
Michigan	"	"	All points outside State.
Massachusetts	"	None	Europe.
Minnesota	"	"	Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Ohio, Wisconsin.

And similar action has been taken by almost a dozen other states, and as in nearly all cases cited, since the beginning of 1917.

Success of Quarantine

It is likewise significant to emphasize the fact that local communities have in more than one case maintained successful quarantines; thus the orchardists of Rogue River Valley, Oregon, combined in 1910, put into effect a quarantine against orchard diseases, and hired an expert plant pathologist as an adviser. Similarly, the melon growers of Rockford, Colorado, have employed such action with success.

8. Scouting carried on during the last two years by the Ontario and federal governments has shown that blister rust is spread throughout practically all of southern Ontario with a spot infection at Petawawa, and others in Haliburton, Victoria, Peterborough and Simcoe counties. Much valuable information in this work has been gained through the schools in response to a circular with colored reproduction of a diseased currant leaf sent out by the Ontario Forest Service, at the suggestion of Mr. W. A. McCubbin, calling for

probably a permanent factor with us in Canada and will have to be considered in future forestry propositions and be combated as in the case of cereal smuts, potato mildew and other blights. Our commercial pine forests lie mostly north of the old Canada Atlantic Railway, which runs from Parry Sound to Pembroke and Ottawa, and the infection has not yet crossed that line except at Petawawa. It would seem most hopeful then to isolate Northern Ontario, with the Canada Atlantic as the southern boundary, and that using this as a base, operations be directed towards the south. These operations would consist of scouting, of eradicating spot infections, and of experimenting with safety belts. In regard to the last operation, there is good reason to believe that the fungus will not spread beyond a belt a third of a mile wide if that be kept free from the alternate host. Michigan touches Northern Ontario along the St. Mary's River, and Michigan is said to be free from the disease and is guarding against it. There is some infection in Southern Minnesota, but the State authorities are actively engaged in routing it out. In Quebec, the St. Lawrence forms a natural bar, and suitable action could

prevent spread of the rust northwards.

The quarantine maintained by Northern Ontario should involve pine and Ribes (gooseberry and currant) stocks and possible Ribes fruits.

Southern Ontario

The problem of Southern Ontario remains and is a very perplexing one. One thing is certain, that as long as we make a fight to keep blister rust out of Northern Ontario it will be necessary to keep in touch with the situation in the southern part of the Province, by means of scouts, schools, or other agencies. It might prove feasible, too, to conduct or to encourage local campaigns in the various affected counties, making use of existing organizations in this work. Such campaigns would have as their object eradication or control. In some districts the value of the currant industry is insignificant, and if such areas could be kept free from the currant, white pine could be planted with safety. Local conditions would determine the action to be taken in every case.

9. The situation in Quebec is not so certain, and this is unfortunate, for if the disease has a foothold north of the St. Lawrence River, not only are the richest of the Quebec forests menaced, but also the task of keeping it out of Northern Ontario is rendered doubly difficult and costly. There should be no delay in carrying out an intensive scouting campaign in Quebec north of the St. Lawrence, and in eradicating or controlling such infections as may happen to occur. The movement of Ribes stocks and possibly fruits should likewise be regulated.

10. The outlook is serious, and the proposition of protecting our pine forests a big one: it is a proposition for the forester and the pathologist, the lumbermen, the nurserymen and local agencies; our efforts may be like an attempt to sweep back the tide, but on the other hand, they may be partially or completely successful. It is, of course, conceivable that our fears are overwrought, but experience does not encourage that hope. The

stakes are large and warrant our best-conceived and prompt effort. Encouragement is to be gained from the fact that the disease has been eradicated from the small areas in Michigan, Indiana, Ohio, and Pennsylvania in which it had broken out, and from one infected spot in New York State, and one in Wisconsin—though only after prompt and drastic action. Southern Ontario and Southern Quebec are infected badly, but our north country is free. Now whether or not our great pine forests of the North will fall a prey to this destructive disease depends on the promptness and efficiency of the action taken. Every stroke will tell if rightly landed, but there must be a good many of them, and today not tomorrow. The problem is a big one and no longer confined to a single interest. It involves federal and provincial governments, lumbermen, and nurserymen—with a relationship, too, to the bordering United States—therefore, it is to be strongly urged that a Commission representing all these interests be appointed to have full control of the entire blister rust situation. On the outcome will depend the reforestation policy of Canada (and to some extent of our neighbors across the line), and the health, productivity, and perhaps existence of our valuable commercial white pine forests.

RESOURCES AND POPULATION

As time goes on, there takes place a gradually reversing proportion of population and natural resources until the multiplication of settlements and growth of cities render the intensive industrial processes of manufacturing and commerce and a more prudential use of natural resources matters of sheer necessity. This very logical readjustment in passing from the simple economic activities of a primitive existence to the complex organization of modern industry, as population increases, is frequently said to exemplify man's most progressive trait—adaptability to environment.—(*"Foundations of National Prosperity"*)

War Needs Collide with French Traditions

Lieut. R. G. Lewis, who is with the Forestry Corps in France, and who in civil life has charge of the forest statistics work for the Forestry Branch, Department of the Interior, Ottawa, writes as follows:—

“We have a French forester attached to us in the capacity of inspector, chiefly I believe to see that we don't do too much damage to the French forests in removing what the British army has bought from the French Government. He speaks no English and his complaints received scant attention at first as the damage was usually done (and often concealed before he could make his complaint through an interpreter. I have been inspecting with him for the last few weeks and whenever his complaints were not unreasonable I have tried to adjust matters. Of course it is absurd to suppose that in war time when there is an urgent demand for lumber of all descriptions, we should take as much time to exploit a coupe as the French bucherons do in peace time. We can, however, avoid unnecessary damage and still keep up production and that is what I am trying to accomplish. I also keep track of the progress of the exploitation of each coupe and compare our final figures with the French service's estimates which are wonderfully accurate. I manage to pick up considerable valuable information along forestry lines from the commandant and from French literature he has recommended and which I am translating. Taking it all into consideration I believe I may derive some benefit from my transfer to the so-called Forestry Corps after all. I have certainly been convinced since I came to France that we weren't taught enough about French forestry methods at the Faculty of Forestry. And I am also convinced that some modification of the French “selection” system is more applicable to Canadian

conditions than the more artificial German methods.”

In a later letter Mr. Lewis says:

“I am still trying to keep the peace between the demand for lumber and the threatened destruction of forest and have come to the conclusion that the man between the devil and the deep sea had more or less of a sinecure. But so far no actual blows have been struck and I have hopes that the war will end before the opposing factors come to actual violence. We keep our stumps low, down to eight or ten inches above ground, we pile our brush as we go. We avoid logging with a donkey and cable and I am sure the loggers have learned to show the volunteer growth more respect than it ever received before at the hands of a Canadian lumberjack. But of course from a forestry standpoint without regard to the war and its necessities, we do a great deal of damage that could be avoided. However, taking everything into consideration, I do not think we do any more damage than is necessary considering the quantity of timber we produce and the speed with which it is produced. And the constant cry is “More production.”

“Do not leave a fire until it is out. After the fire is surrounded by a fire trail, and back-firing has been done, the crew should be put at work covering all burning logs and stumps with earth. If available, water should be used to extinguish all smoldering places along the fire-trail. The crew should not be reduced too rapidly, since a high wind may fan the smoldering fires into flame which will spread across the fire-trail and all the work of days will be undone. Keep one man on the burned area at least three days after the balance of the crew is disbanded. This is the most important rule of all.”—*From instructions to fire rangers of California State Forester.*

Good Results in Prairie Planting

BY ALEX. HARDING, LOUGHEED, ALBERTA.

When I began the work of raising conifers here twelve years ago the work met with the greatest scorn and ridicule from the public. People hoped that the experiment would be a disappointing failure. I was young then and the district had just been opened but today most people consider that it has been a fine work. Most of the spruce are now eleven years from seed and many of them are from 7 feet to 9 feet 5 inches in height. Pines are nine years and range up to 12 feet high.

I have saved seed at times since and have a small stock coming on. I also set in parcels of young trees from the woods. I have planted a good sized patch both in the natural woods and in the open, but at present my intention is to carry out a thorough experiment covering all features of the work so that in time I can plant

a fairly large area with the greatest economy.

Protection against the various enemies of trees is the thing which offers the greatest difficulty, but I think that ways have been arrived at to meet them.

It is my desire to carry out an experiment with Engelmann spruce but so far have been unable to obtain either seed or little trees from our own Rockies. It is not that I expect this species to excel the white spruce, but I consider it best to make use of several of the best species of timber trees when developing a farm woodlot. The white spruce is very free from injuries and defects but no one can tell what is ahead and by referring to European texts it becomes quite plain that trusting mainly to species is not the best forestry method.

What is the Purpose of Conservation ?

The purpose of conservation, in practice and as a public policy, is to increase the productive power of natural resources and to heighten social values. As we insist, it deals not with natural resources alone, but with the coordinated functioning of natural resources, labor, and capital; and it is particularly concerned with their productive possibilities in the future as compared with their actual utilization in the past and the present.—“*Foundations of National Prosperity.*”

Private Rights and Social Welfare

“The final arbiter between private rights and social welfare is official authority asserted in behalf of the sovereignty of the State and perpetuity of society and made effective through the arm of the police power in supervising and, possibly, restraining the arbitrary exercise of individual freedom and in restricting the unsocial use of property.”—“*Foundations of National Prosperity.*”

“Natural resources are but one of three essential economic supports of industrial society. Excepting extreme conditions of extensive or intensive industrial organization, land, labor, and capital are mutually interchangeable and compensatory in productive processes. The economic importance, or value, of a unit of either in terms of another is, at any time, inversely proportional to the relative supplies of the two.”

Conservation has been characterized as a managerial policy designed to promote industrial capacity.

Genealogy of Forest Products

By G. C. PICHE.

A—Raw materials obtained from the forest without manufacturing.

Firewood, mine props, fence posts, hop poles, railway ties, masts, marine timber, booms, poles.

Sawlogs, square timber, flat timber.

Hemlock bark, birch bark.

Foliage for decoration purposes, fruits, nuts, flowers.

Spruce gum, pine gum, tamarac gum, Canada balsam.

B—Uses of forest products in the industry.

I—The timber is not affected in its physical appearance.

a—The industrial preparation is brief.

Sawn lumber, deals, boards, etc.

Building timber, beams, joists, rafters, etc.

Shingles, laths, mouldings, flooring, etc.

b—Manufactured goods.

Packing cases, boxes, cooperage goods, veneer furniture, carriages, farm wagons, railroad cars.

Musical instruments, caskets and coffins, trunks, valises.

Excelsior, shuttles, spools, bobbins.

Agricultural implements, machine construction, handles, pulleys, boot and shoe findings.

Matches and toothpicks, brushes, novelties, woodenware.

Ship and boat building, sporting goods, etc., etc.

II—The wood is transformed into pulp and paper.

Mechanical pulp, chemical pulp or cellulose.

Newspaper, writing paper, wrapping paper, toilet paper.

Fibreware (buckets, pails, tubs) undergrounds, conduits, viscose, twine, cloth, carpet, artificial leather, all manufactured from pulp.

Mordants, alcohols, turpentine, acetone, Oxalic acid, etc., extracted from residual liquors of this fabrication.

III—Maceration or distillation of wood, leaves, etc.

Potash, obtained by washing ashes.

Tanin, drawn from the barks of oak, hemlock, etc.

Charcoal, residuous of the distillation of wood.

Wood alcohol, turpentine, Acetate of lime, gas, tar, creosote, obtained by distillation of wood.

Cedar oil, spruce oil, etc., by distillation of needles.

Maple syrup, maple sugar, birch syrup, by evaporation of sap of maple, or birch.

Fickle Policies and Timber Rotation

BY SIR RONALD MUNRO-FERGUSON.

"A crop of timber is not like a crop of corn. It needs a rotation on the average in Australia of, I suppose, from 60 to 70 years; sometimes more or less. But if you take an average of 60 to 70 years, it means that you have to look forward to that time, and the man who plants to-day will be judged 70 years hence by the results of his handiwork, and he will be regarded either as a benefactor of his country or a parasite upon it, according to the result of the cutting.

To secure that continuous good management over so long a period is, therefore, essential. There must be no break, no change of policy. Ministers, governments, majorities as I know very well from my experience, are creatures of the day—here to-day and gone to-morrow—but forests go on for ever, and, therefore, either by commissions or otherwise, provision is necessary to secure a permanent policy without change, but always making improvements."

The National Purse and the Paper Mill

In 1912 the total value of pulp and paper products, exported from Canada amounted to but \$14,659,325. In the ensuing six years this amount had increased to \$52,924,888. For the current fiscal year the total exports promise to exceed \$60,000,000,—the ten months ending in January, 1918, showing a total of \$51,817,707. More than one-half of this amount applies solely to newsprint paper, of which our exports last year exceeded \$26,000,000. The figures also include chemical pulp to a considerable amount and mechanical and pulp wood and other minor products. Most of these exports were sent to the United States. The annual domestic consumption of paper produced in Canada exceeds in value \$20,000,000,—making a total annual production of pulp and paper for foreign and domestic use of approximately \$80,000,000.

In 1890 there were 58 pulp and paper mills in Canada, capitalized at \$7,574,118, and giving work to 2,817 employees. In 1915, the number of mills had increased to 80, the amount of invested capital to \$133-

736,602, and the number of employees to 15,686.

The amount of capital at present invested in the pulp and paper industry in Canada is more than \$145,800,000. Together with transportation and electric light and power development, the pulp and paper industry ranks as one of Canada's three greatest industries.

The phenomenal growth of the Canadian pulp and paper industry is traceable, primarily, to government restrictions placed upon the export of pulp wood from Canada and the removal of the import duty on newsprint paper and pulp by the United States Government. To these may be added the influx of a large amount of new capital, the enterprise of the manufacturers and a greatly stimulated demand for the finished product during recent years.

The value and importance of such an industry to the Dominion of Canada at the present time—in view of the fact that our unfavorable trade balance with the United States, our chiefest buyer of pulp and paper products, now exceeds \$400,000,000 annually—is almost beyond computation.

New Brunswick on the Right Track

(From the report of Hon. E. A. Smith.)

My predecessor in office is entitled to the thanks of the people of this Province when he organized the Forest Survey, and I am glad here to place the credit where it belongs. Here we have a staff of professional men, non-partisan, with one great object in view, the preservation and care of the forests. The Department of Forestry was carefully planned with a competent staff and an up to date equipment. My proposal for this new Crown Land policy is to remove the administration of the forests to a very large extent, if not altogether, from the sphere of politics. This does not mean that we are going to eliminate the present service altogether, but on the contrary we propose to retain many competent men now in the employ of the Department. It is proposed to combine the following services, viz.:

Protection of forests from fires

Scaling of lumber cut on Crown Lands.

Protection of game

With one efficient staff the Chief Officer of which will be The Director of Forest Surveys under a Board consisting of:

The Minister,

The Deputy Minister.¹

The Director of the Forest Branch and two others, one representing the leaseholders and one representing the owners of Crown Granted Timber Lands.

The Board will have authority to appoint the necessary staff to carry out these duties and the men employed to possess the necessary qualification after examination. It is estimated that a fund of one hundred thousand dollars will be required annually to carry on this service and it is proposed this fund will be raised as follows:

From taxes received from wild lands	\$ 30,000
From Licensees Crown Lands	

one half cent per acre about.....	30,000
From Provincial Government.....	40,000
	<hr/>
	\$100,000

A new up to date fire service to be inaugurated to include the organization of sufficient competent men to cope with forest fires in all parts of the Province, whether on Crown or granted lands; building telephone lines in the forest; erection of look out stations; cutting fire trails; necessary tools for fighting fires; gasoline engines for railway work, in short everything that experience has taught is necessary in the prevention of the great fire evil. Already we have the co-operation of the Railway Commission in extinguishing fires along railway lines, together with their valuable support and advice in the past in all matters of a fire nature. It is my hope in the very near future, the Canadian Government Railway System will become subject to the Railway Commission in all matters regarding forest fires.

At present the fire service is more a name than a reality. It is true the game wardens by their commissions are appointed fire wardens as well, but it is found when a fire breaks out these men are left pretty well on their own resources and are without the necessary equipment and organization to cope with the fire evil.

PHILLIP T. COOLIDGE
FORESTER

Timber Estimating and Mapping.
Supervision of Lumber Contracts.
Surveying. - - Forest Planting.

STETSON BLDG., 31 CENTRAL ST.
BANGOR, MAINE.

Great Fire Hazard in N. W. Ontario

Representatives of railways, lumber and pulp and paper interests, the Ontario Government and fire rangers of Ontario recently held an important meeting at Port Arthur, in an endeavor to secure closer co-operation of all interests in the prevention and fighting of forest fires.

It was shown that the protection of the existing pulp and timber limits was absolutely essential to the future of the lumbering and pulp and paper industries. It was no less important to the agricultural future, since lands that had been badly burned over were rendered practically useless by the destruction of the soil. The district covered by the meeting boasts of its potential water powers, yet if the forest areas were destroyed, the value of these resources for water power purposes would be cut in two for all time and the rivers made subject to excessive floods and droughts with resultant damage to all dependent interests.

Reasons For High Hazard

The hazard in the district was rendered much greater:

1. Because of the abnormally dry spring weather and almost entire absence of rains, and location in proximity to Lake Superior, which retards the early spring growth.

2. High prevailing winds during the dry period of April, May and June.

3. Increased danger from settlers' fires, due to opening up and clearing of lands.

4. From Loon Lake on the east to the height of land at Raith, on the C. P. R. and C. G. R., and Kasha-bowie on the C. N. R. there are the heaviest railroad grades between the Atlantic seaboard and the Rocky Mountains. The consequent danger from locomotive fires in this area are greatly increased.

Publicity and Vigilance

It was recognized that in addition to all other precautions, that publicity co-operation, and eternal vigilance

on the part of all concerned, must be secured.

On behalf of the Department of Lands, Forests and Mines, L. E. Bliss, Superintendent of Fire Rangers said that he fully recognized the seriousness of the situation, and stated that his department which had recently been reorganized, had arranged for increased protection. In a short time he hoped to have such measures and protection in force as would be second to none in either Canada or the United States.

The department was providing for additional equipment such as truck, car, rangers, and lookouts, etc., and that the fire laws would be strictly enforced, that a special endeavor would be made to locate the cause of all fires, and to hold all careless parties legally liable for infraction and disregard of the fire laws, for which heavy penalties are provided, that during the extreme dry season all setting out of fires would be prohibited if found advisable. It was in the interests of all, therefore, that no fires should be allowed to get beyond control, that would endanger the property of others, otherwise drastic measures would have to be adopted.

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

ASK



FOR



Research Council and Reforestation

Sir George Foster, on May 17th, tabled in the House of Commons a report by Prof. Macallum, administrative chairman of the advisory committee on scientific and industrial research. The report, which is a voluminous affair, covers the various branches of enquiry instituted and carried on by the advisory council since its appointment.

There are some interesting references to the work done by the committee which enquired into the question of the growth and reproduction of the forests of Canada, more particularly those of the eastern provinces. In regard to this matter, the report says:

"The research council is of opinion that this investigation of the growth and reproduction of our forest trees, thus inaugurated and continued, will, in a few years, enable the forestry departments of Dominion and provincial Governments to inaugurate, on a scientific and practical basis, a scheme of reforestation, which will parallel the best results obtained in the past in Europe, and, in consequence, preserve for Canada, one of her greatest and enviable resources, now in danger of extinction, because of reckless waste, and of the almost entire disregard of any system required for its prevention."

Harrisburg, Pa.

DANGER TO WHITE PINE

Editor, Canadian Forestry Journal.

I beg the privilege of calling your attention to a short article on page 1153, December Number, with the heading "White Pine Immune In N. B.," since the headlines unfortunately carry an erroneous impression.

Probably this has been called to your attention by some of your own plant pathologists, and it may be well and desirable to correct in another issue the impression which might have been gained in the minds of your readers, that New Brunswick

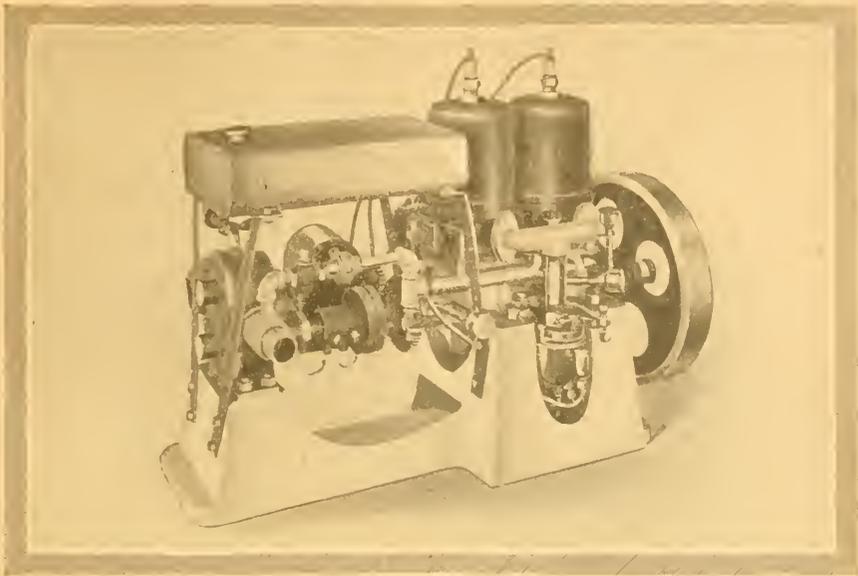
white pine is immune from this extremely dangerous disease. Apparently you desired to convey the idea that the disease had not yet been discovered in this province, but most assuredly the white pine species, wherever it grows, is not immune from the disease. We have the problem with us in Pennsylvania, and I am exerting my utmost effort to hold it in check, and, fortunately, last year by very early and thorough eradication of infected pines, we prevented as far as we could determine by inspection in over half of the counties of the state, including over two and a fourth millions white pines, and over one hundred thousand separate currant plants, the spread of the disease from the pines to the currants. This fortunate situation, I fear, can not last long, even with the most careful inspection.

J. G. SANDERS.

Economic Zoologist.

LONGEVITY OF TREES

Regarding the longevity of European trees recent information gathered by the German Forestry Commission assigns to the pine five hundred and seven hundred years as a maximum, four hundred and twenty-five years to the silver fir, two hundred and seventy-five years to the larch, two hundred and forty-five years to the red beech, two hundred years to the birch, one hundred and seventy years to the ash, and one hundred and thirty years to the elm. The heart of the oak begins to rot at the age of three hundred years. A *sequoia gigantea*, felled in Calaveras county, California, had attained the age of three thousand years. It was three hundred and eighty-seven feet in height, and measured fifteen feet in diameter, one hundred and twenty-five feet above the earth. The Bradburn yew, in Kent county, England, had attained the same great age.



Fairbanks-Morse Forest Fire Pump showing carburetor side of engine and discharge side of pump

AN OPEN LETTER:--

"We extinguished two forest fires on two different occasions with the aid of this pump, using it for three days, each time from 3 a.m. to 11 p.m., only stopping when changing it from place to place.

It has proved a grand success, and has more than made up for its cost, in the saving of fire-fighters' wages and in timber saved."

A Fairbanks-Morse Forest Fire Engine will exactly fill your needs. Full information on request.

The Canadian Fairbanks-Morse Co., Limited

St. John, Quebec, Montreal, Ottawa, Toronto, Hamilton, Windsor, Winnipeg, Saskatoon, Calgary, Vancouver, Victoria.



Easily transported in Canoes, Skiffs or Launches



Two men can pack it easily with stretcher and shoulder straps.

Paying the Fire Fiend His Price

(Excerpt from New Brunswick Forest Service report.)

The loss due to the destruction of timber alone, to say nothing of the rendering of the soil unfit for good natural reproduction, is so enormous that it surpasses the ordinary imagination. It is the common belief among the people, and is probably true, that had not Cains River been so severely burned, that the vast pine and spruce forests would have been

almost inexhaustible, and that this area would still hold the important place in the forest industry of the Province that it held in the early days of exploitation of the timber lands of New Brunswick. The need of proper fire protection and of scientific management of our existing Crown Land forests can not be too strongly urged at the present time.

60 Public Meetings in Quebec in Six Weeks

Some first-class propagandist work has been carried out this month in Quebec Province by Messrs. Victor Baillarge and Gustave Tessier of the Department of Lands and Forests. The Canadian Forestry Association was privileged to co-operate with the Department in the arranging of a series of public meetings in the territory of the Laurentian Forest Protective Association and the St. Maurice Forest Protective Association, covering Central Quebec on the north side of the St. Lawrence. The managers of these associations gave thorough and valuable co-operation in the scheme and went to much trouble in making local arrangements through members of their staffs.

The preparations, however, bore

abundant fruit. Although the idea of public forest protection meetings is something of a novelty in parts of Quebec, Messrs. Tessier and Baillarge met with a goodly reception and were able to deliver illustrated addresses to audiences seldom running below 150 persons and reaching 400 and 450. The assistance of the parish priests was admirable and other leading citizens were glad to give the meetings any help they could.

The consequences of these public lectures, (about 60 since the third week of May) can hardly be measured in mathematical equivalents. It is well-known that ignorance, prejudice, indifference are the great trio of forest destroyers in all parts of Canada, and there is no way of combatting them except by the educational method.

GOATS FOR BRUSH CLEARING

The use of domestic stock to keep down brush along fire guards and railroad rights-of-way may be a rather novel idea to the forest ranger, but I will back twenty goats to do more work and do it better in brush destruction than one man. When once the large timber and all over eight feet high is down, then leave it to the goats to do the rest. They will surely keep down brush sprouts and

young timber. Herds of angora, numbering five hundred or so, herded slowly along the old tote roads will keep them from ever growing back into brush. One will be surprised at the way a few goats will travel along a road nipping twigs and leaves. They are almost continuous in their work, travel and eat all day and at night they are easily corralled.

When fires would come to those pastured roads there would be small

TREES, SHRUBS AND SEEDS

Hardy Northern Trees and Shrubs at Lowest Prices. Native and Foreign Tree Seeds

EDYE-DE-HURST & SON, DENNYHURST

DRYDEN, ONT. Shippers to H. M. Government, Etc. Correspondence Francaise.

Hill's Seedlings and Transplants

ALSO Tree Seeds for Reforesting. Best for over half a century. Immense stock of leading hardy sorts at low prices. Write for price list and mention this magazine.

Forest Planters Guide Free.

The D. Hill Nursery Co., Evergreen Specialists
Largest Growers in America.

Box 503 Dundee, Ill., U.S.A.

Try This Stump Puller at Our Risk

The Smith Stump Puller will take out every tree and stump by the roots, clearing from one to three acres a day, doing the work of twenty men. We want you to send for our 3 year guarantee against breakage and our free trial proposition. Address W. Smith Grubber Co. 11 Smith St. LaCrescent, Minn.



Gagnon & Marissette

Lumber Contractors
Timberland Cruisers
Forest Industr. s

CHICOUTIMI, P.Q.

LT.-COL. L. J. D. MARQUIS

Forest Engineer and Mem. Can. Soc. of F.E.;
Quebec Assoc. of F.E.; Former Mem. Que. F. Service

Forest Cruising and Mapping
Timber Factors and Logging Costs
Facts on Forest Growth and Future Products

90 LOCKWELL AVENUE, - - QUEBEC

R. R. BRADLEY

Forest Engineer and Mem. Can. Soc. of F. E.
Consulting Forester to the New Brunswick Railway Co.

Timber and Pulpwood Estimates. Forest Maps. Advice on the Management of Wood Lands. Timber lands listed for sale.

GLOBE ATLANTIC BUILDING, ST. JOHN, N.B.

YALE UNIVERSITY FOREST SCHOOL

NEW HAVEN, CONNECTICUT, U.S.A.

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

For further information address

JAMES W. TOUMEY, Director
New Haven - Connecticut

chance of crossing and fire fighters would have ten times better chance than if they had everywhere to contend with brush.

I would suggest that those roads be cut to at least forty feet wide and wherever a river and a railroad run parallel, even if fifty miles apart, I would run one of those fire guards from one to the other at reasonable distances apart—say in ten or twenty miles. This would make blocks of country offering reasonable insurance against fire spreading.

If the provincial government ever tries five hundred goats on this work under a good careful flock master, they will never be without them.

H. H. CLEUGH

Vancouver, B. C.

Large Public Meetings on Forest Protection

Mr. Robson Black, Secretary of the Canadian Forestry Association, held six public meetings in the Ontario Claybelt district on forest protection subjects during the week of June 10th. Addresses were illustrated by motion pictures and "dissolving views" in natural colors. At Cochrane and Iroquois Falls, four meetings were held on Monday and Tuesday to accommodate the children from the schools as well as the adults. The evening meetings were therefore at-

tended almost entirely by adult residents, the capacity of the halls being taxed in all instances.

The relation of the forests to the people of Northern Ontario's tree-covered agricultural soils is by no means identical with forestry interests in other parts of the Dominion, but is none the less emphatically real. It is hoped that further meetings will be held at Timmins and other points during the summer. Members of the Ontario Forest Service gave splendid co-operation.

A MEMBER'S LETTER

Silver Mountain, Ont.
June 12th, 1918.

Secretary,
Canadian Forestry Assoc.,
Ottawa, Ont.

Dear Sir:—

I am enclosing herewith the Annual Membership fee, and I would like to say that it gives me great pleasure to belong to such an Association. The Canadian Forestry Journal is very interesting and instructive and becomes a great help when speaking to others in my district.

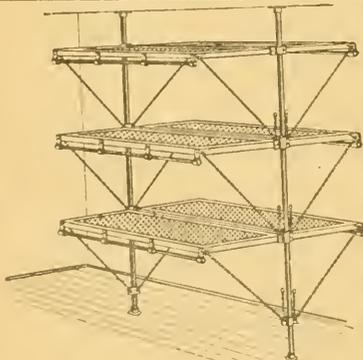
Wishing the Association every success,

Yours truly,
(Sgd.,) George Walker.

TO CANADA FOR TIMBER

A report received at Ottawa from J. E. Ray, Canadian trade commissioner, Manchester, England, indicates that the British government is propounding a scheme to erect at least 300,000 houses under state and municipal rate aid as soon as conditions are favourable. "This prospective demand for building timber, doors, window sashes, etc." says Mr. Ray, "should be closely followed by Canadian manufacturers."

"There are unmistakable signs that after the war, timber merchants and builders will turn to Canada for larger supplies of these structural woods than they imported four or five years ago."



STEEL BUNKS FOR CAMPS

Included in the well-known line of DENNISTEEL factory, hospital, camp and ship equipment is the all-steel sanitary bunk illustrated. Take up very little room, are comfortable, hygienic and practically indestructible—a permanent investment. Write for particulars and folders on any of the following lines:

Steel Lockers, Bins, Cabinets, Chairs, Stools, Etc.
Standardized Steel Shelving (knock-down system).
Steel Hospital Equipment. General Builders' Iron-work.
Ornamental Bronze, Iron and Wirework.
Wirework of every description.

**THE DENNIS WIRE AND IRON
WORKS CO. LIMITED**

**LONDON
CANADA.**

Halifax

Montreal
Winnipeg

Ottawa

Toronto
Vancouver

CONFEDERATION LIFE

ASSOCIATION UNCONDITIONAL ACCUMULATION POLICIES

Are liberal up-to-date contracts which guarantee to the insured every benefit consistent with safety.

Write for Particulars

which will gladly be furnished by any representative of the company or the

HEAD OFFICE, TORONTO



QUEEN'S UNIVERSITY

KINGSTON
ONTARIO

ARTS MEDICINE EDUCATION APPLIED SCIENCE

Mining, Chemical, Civil, Mechanical and
Electrical Engineering.

HOME STUDY

Arts Course by correspondence. Degree with
one year's attendance

Summer School **Navigation School**
July and August. December to April.

GEO. Y. CHOWN,
Registrar.

MINIATURE CONSTRUCTION

Landscape, Mechanical and Architectural Models, Topographical Maps and Paintings. for

SCHOOLS — COLLEGES — MUSEUMS
Government work a specialty

MORGAN BROS. CO., Inc.
MODEL MAKERS

Room 1650 Grand Central Terminal
Phone 7720 Murray Hill

NEW YORK CITY

UNIVERSITY OF NEW BRUNSWICK

FREDERICTON, N.B.

DEPARTMENT OF FORESTRY
Established in 1908

Best of facilities for definite instruction and supervision in Practical Forestry.

Surveying, cruising and construction work carried on in our own tract of 3600 acres, with Forestry Camp in the centre.

Competent men from the School at present in demand to take up Forest Survey work with the Provincial Crown Land Department.

For further information address :

DEPARTMENT OF FORESTRY

University Calendar furnished on application.

C. C. JONES, Chancellor.

R. O. SWEEZEY

(B. Sc., M. Can. Soc. C.E.)

CONSULTING ENGINEER.

Water Powers. Timber Lands.
Financing Forest Industries.

164 St. James St. MONTREAL.



Real Forest Protection

One essential thing in any scheme of forest protection is a rapid, dependable means of communication.

Cutting and Washington wireless sets are the most reliable means of communication in the world today. No C & W set has ever broken down in service, and no set, in a moment of danger, has ever failed to work the distance desired. C & W sets are always ready.

Once installed, the up-keep cost is negligible—there are no wires to keep up and cause trouble. Simple, easy to operate, inexpensive, reliable—that's Cutting & Washington wireless in a nut shell—real Forest Protection.

May we help you solve your problem?

Today is the best day to write

Cutting & Washington, Inc.

1083 Little Building - BOSTON, Mass.

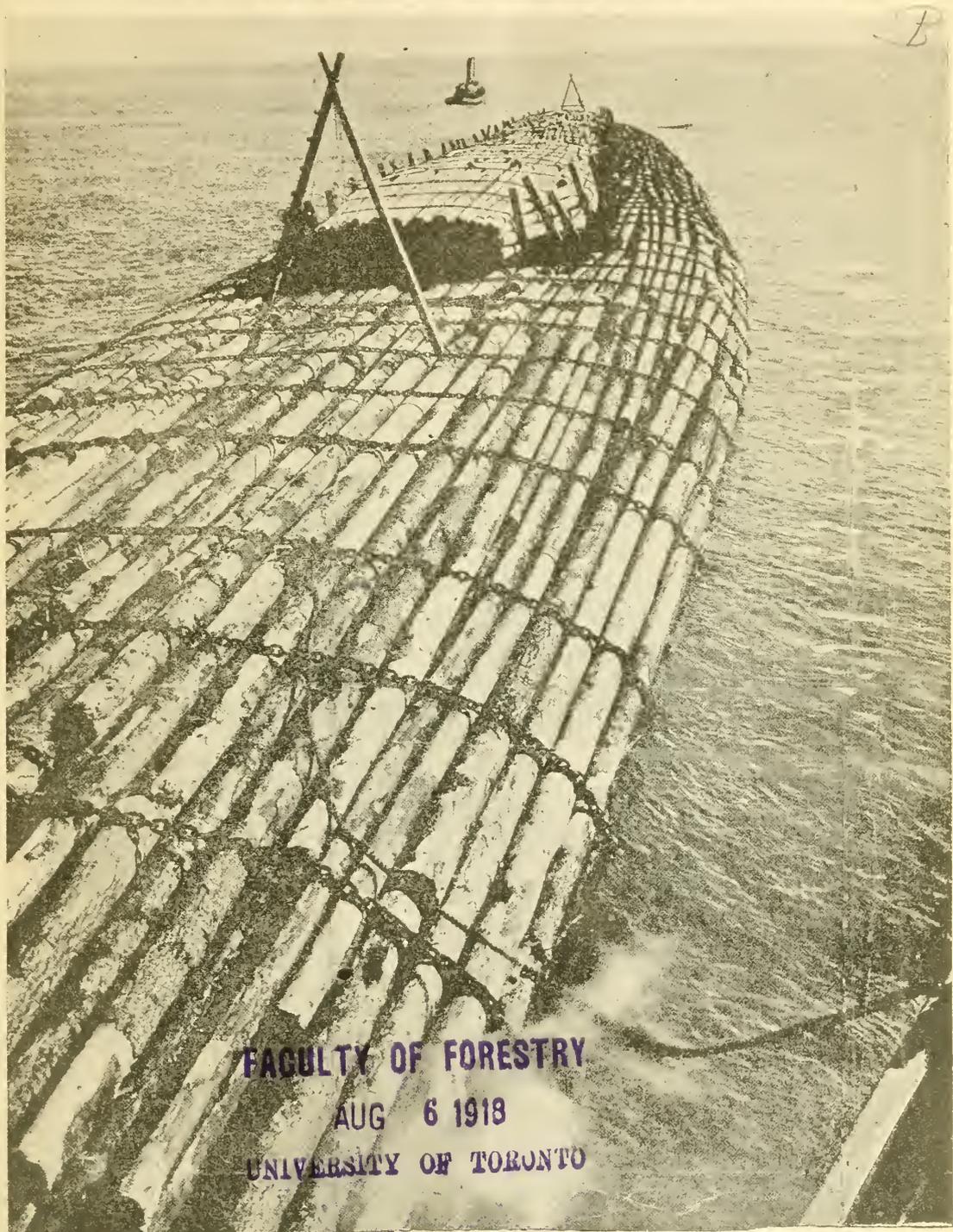


Canadian Forestry Journal

Vol. XIV.

JULY, 1918

No. 7



FACULTY OF FORESTRY
AUG 6 1918
UNIVERSITY OF TORONTO

A Davis Raft (the invention of a British Columbian), containing five million feet of wood, successfully made an ocean journey from Puget Sound to Chile. A Davis raft, abandoned by its tug, was once sighted 2000 miles out in the Pacific and seemed quite unharmed by its experiences.

TENTS IN EVERY STYLE

May be had made up of
the celebrated



Write for Samples and Prices.

The Woods Manufacturing Co., Ltd.

FORMERLY SMART-WOODS, LTD.

OTTAWA - TORONTO - MONTREAL - WINNIPEG

FOREST TELEPHONES



Make the life of the forester better worth living. They relieve him from the appalling loneliness. They help him to keep in human voice touch with foresters miles away.

In emergencies—fire—sickness—hunger—the speed with which they can summon help is marvellous.

Write for full particulars of how to install the Northern Electric Forest Telephone System. Address the Office nearest you.

Northern Electric Company
LIMITED

Montreal
Halifax
Ottawa

Toronto
London
Winnipeg

Regina
Calgary
Vancouver

Northern · Electric · Forest · Telephones ·

Canadian Forestry Journal

CIRCULATION 6500 COPIES MONTHLY

ROBSON BLACK, Editor.

Vol. XIV.

WOODSTOCK ONT., JULY, 1918

No. 7

CONTENTS FOR JULY

- “Bringing Back the White Pine Forests”
By R. H. Campbell, Director of Forestry.
- “Riddance of Patronage a Great Gain”
- “Save the Soldiers from Profitless Lands”
- “Forest Fire Losses in the West”
- “Railway Roadmaster Sets Good Example”
- “Britain’s Airplane Fleet Awaits a Labor Supply”
- “Why Forest Reserves are Created”
- “The Origin of the Christmas Tree”
- “The Pejepsco Plantations”
- “Settlement Problems After the War”
- “Keep the Woodlot for Future Use”
- “The Forests of Cyprus Coming Back”
- “For Every Acre a Proper Crop”
- “The Function of Watershed Forests”
- “Delusions Must Give Way to Facts”
- “Can Forest Revenues be Maintained?”
- “Canada’s Pulpwood Resources”
- “The Inroads of Timber Substitutes”
- “Forest Legislation in Canada 1917-18”
- “The Motor Truck in Logging”

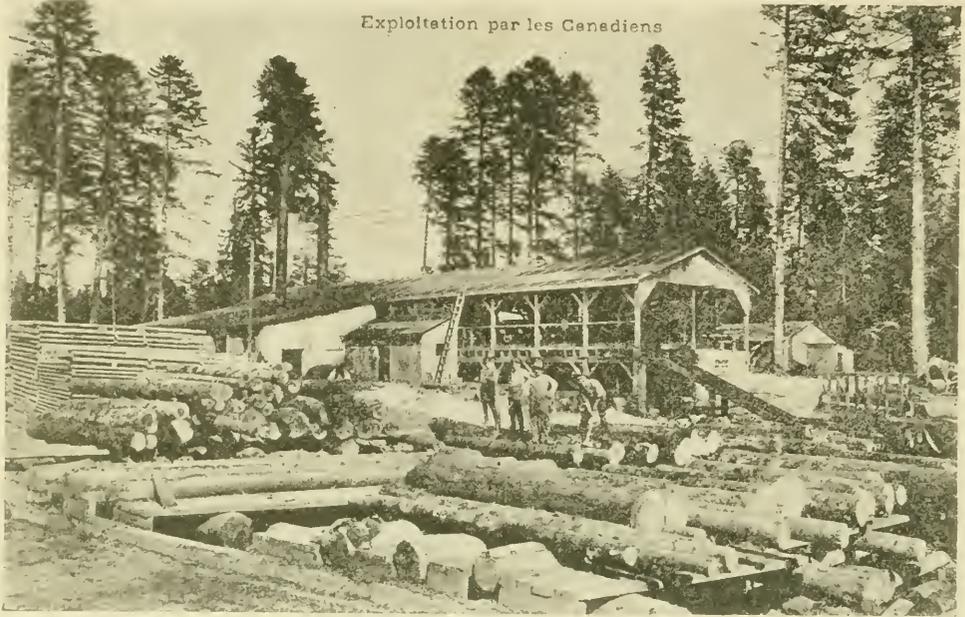
The Canadian Forestry Journal will be sent to any address for one dollar a year, subscription including all other publications of the Canadian Forestry Association.

Address all Communications to

THE CANADIAN FORESTRY JOURNAL
206-207 BOOTH BUILDING, OTTAWA

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

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



A Canadian Forestry Battalion Saw-mill in the Jura Mountains, France.



Canadian Forestry Battalion Camp in the Jura Mountains, France.

Bringing Back the White Pine Forests

BY R. H. CAMPBELL, DIRECTOR FORESTRY, OTTAWA.

A Striking Discussion of the Factors Helping and Hindering the Growth of Perpetuation of Pine.

In spite of the value to which spruce has climbed in recent years and the dangers to the white pine which are threatened by the white pine blister rust and other evils the fact remains that over a great part of eastern Canada the white pine is the best tree to grow while it is the most distinctive and well-known timber. Its reproduction is therefore a matter of great interest and one well worthy of careful study and observation. But at the outset it should be recognized that the problem is not a simple one and is not to be solved finally and satisfactorily by opinions based on superficial observation or experiments, but will require years of careful management and balancing of the various influences that affect regeneration to decide what is the best method to follow and how it should be modified to meet changing conditions. Government forest experiment stations which will carry such experiments through to a conclusion are absolutely necessary if the proper methods are to be worked out and understood. With the cooperation of the Honorary Council for Scientific and Industrial Research a forest experiment station is being organized by the Dominion Forest Service at Petawawa in a typical pine region of Ontario where the systematic study of conditions following lumbering for pine and the possibility of bringing about its reproduction will be carried out.

A Complex Problem

In the meantime the question may be discussed from the general knowledge of the habits of the white pine and of the methods followed in other countries with species of the same general characteristics. The first thing that strikes the attention in studying the methods followed in

other countries is that the problem is not a simple one but a complex one and varies with every varying condition as to soil, moisture, light and mixture of species. To quote Professor A. Jolyet of the Forest School of Nancy in his work on Silviculture:-

"A forest is not, like a field of wheat, a simple group of individuals of the same species growing side by side to the time when the bushman decides the fit time has arrived to use the axe; forest species, with requirements often the most diverse, find themselves growing together and from birth to old age they not only increase in size but they modify their wants not only according to the physical condition of the soil which bears them, or according to the space which is allowed them; they themselves, increasing in size or shedding their foliage, have a considerable action on the soil, upon the quantity of light which they allow to pass to it; upon the debris which they give to it; always in a struggle with one another they lend themselves or oppose themselves to the existence of a whole population of trees newly arrived, of shrubs, of low plants or of animals which in their turn react upon them."

The white pine is a tree suited to light, well drained soils and such soils are the ones that should be devoted to its production. Not that it will not grow on richer soils as the finest pine known was that growing on good soil amongst the hardwoods, but these lighter soils are the ones available for forest purposes to which the pine is best adapted and on such soils it should be favored in every way.

Handicaps on Germination

What have been the results of some of the operations that have

been carried out in previous years? The pine amongst hardwoods generally dominated the stand, but when it was cut out the hardwoods held the ground. Their shade prevented germination of the pine seed or the development of the tree, if the seed did germinate. The result was that the forest became a hardwood forest and there is no evidence left of the existence of the pine except the old stumps or an occasional young pine that has happened to have special circumstances in its favour in a particular spot. In some pine forests the understory was of spruce and fir, both of which germinate and grow better under shade than does the pine, and when the pine was cut out the understory became the forest and the pine had no opportunity for reproducing itself in such adverse circumstances. In many cases these results may have been satisfactory to the interested parties but in a study of the possibilities of the natural regeneration of white pine the cases are significant. They show that the problem is not a simple one for even if the pine had not been taken out in the circumstances indicated and was left to produce and scatter seed it would in time have been vanquished by the understory unless a fire or harricane had come and opened up a space to light where the seeds could germinate and the seedlings grow.

The pine is firm rooted and can therefore stand isolation without danger of windfall better than some other species and while it requires light its demands in this respect may be considered as moderate. It would therefore lend itself to a system which would permit of the opening up of the stand of timber to a considerable extent.

Systems of Cutting

There are several main systems on which cutting is carried out. One is the clear cutting system in which all the pine is taken off the ground. This system might be followed where the stand of pine is mature and fairly even-aged, but in order to secure the reproduction of pine several things are necessary. There

must be a stand of young pine on the ground ready to take the place of the old or provision must be made for a supply of seed before the old trees are all taken out. If the cutting is carried out after a good seed year there may be sufficient of a supply of seed fallen which, germinating in the light and warmth of the uncovered ground, may furnish a satisfactory stand for establishing a new forest. If not then some of the pine must be left to furnish seed. But these must be left with reference to prevailing winds and the distance to which seed will carry. The pine seed furnished with a light wing and borne high in the tree in the long pendant cones will carry for long distances, but the proper distance within which a sufficient seed supply will fall must be determined by observation in different districts. If, however, the ground is covered thickly with pine needles when the seed falls it may never reach the soil and get a chance to germinate and grow. With the too full opening of the ground, the grass may get a chance to grow and in a struggle with grass the pine has not much chance. If, however, the new growth is light, shrubs and such trees as poplar and white birch, the pine may be expected to hold its own and to overtop the others in time, and it may do this with the heavier shaded hardwoods if they get away to anything like an even start.

If, however, when the pine is removed, the ground is shaded by a dense covering of hardwoods or of spruce and fir, the chances for the germination and growth of the pine are almost nil, and to ensure pine reproduction they would require to be removed at the same time as the pine.

Local Conditions Mean Much

The system most discussed in Canada, however, and the one supposed to be indicated by the diameter limits for cutting set by the several governments is the selection system, the system by which a selected number of trees are taken out and the remainder are left to increase in size and to furnish a seed supply. But this system, even though carefully



In a White Pine Forest at Madawaska, Ontario

followed, does not furnish all the conditions necessary. The soil and light conditions may not be satisfactory. Here the presence of some broad-leaved trees, the fallen leaves of which assist the disintegration of the pine needles, will assist in preparing the soil. And the light conditions required for germination may be secured by making heavier cuttings scattered through the area of operations or the cutting generally may be made sufficiently severe to open the soil up fairly well to the light. What size of openings are to be made or how far the soil is to be exposed will depend a great deal on the nature and conditions of the soil and of the forest cover. Experiment and observation must determine the question and at the present time

only general indications can be given from a general knowledge of the manner of reproduction of trees and the habits of the white pine in particular.

A Task for Foresters.

Until the forester gets into active touch with the timber operations and has some authority in directing them so that observations will be made accurately and systematically and with due regard to all factors we will be working largely in the dark. It is by this method and by this method only that the forests of Europe have been brought to the perfection they have reached. It has taken time there. It will take time in Canada, but a beginning on right lines as indicated cannot be made too soon.

The Forests of Cyprus Coming Back

In ancient days Cyprus was no doubt rich in timber, and its mountain districts were clothed with trees varying with the altitude. In 1878, when Cyprus passed under British control, the condition of the so-called forests was deplorable, and it was clear that strong steps, aided by scientific knowledge and a Government Department, must at once be taken to remedy and stop the cause of destruction. An Ordinance was passed in 1879 for the delimitation and preservation of the forests; and successive Forest Officers sought to remedy some of the abuses by prosecution in the Courts, while the forest areas were gradually delimited and settled. They now extend to some 700 square miles.

The trees consist principally of the Aleppo pine, but, at an elevation of 4000 ft. and over, of *Pinus Laricio*. Large tracts are also covered with *Quercus alnifolia*, which is much in demand for making native ploughs and carts, while *Arbutus* flourishes in many places on the slopes of the hills and is used in the manufacture of rough furniture.

With very small sums voted an-

nually to the Department, protection was the only course open to those in charge; and no progress in artificial reforestation was made till many years after the occupation. Since 1907 special tree-planting has made considerable progress, some 300 miles of fire-paths have been made, and goats will gradually be excluded altogether by means of legislation passed in 1913 on the principle of local option for each village. The police protection has on the whole always been good, and there is no doubt that the forests of Cyprus are now in a fair way to recovery, and are likely to become an added source of beauty and prosperity to the island. It may be interesting to note in this connection that the rainfall appears of late years to have increased.

WILLOW TREES SELL HIGH

A farmer residing along the Credit River, Ontario, planted willow trees on the river banks thirty years ago. During the past month he was offered \$1500 for the willows as they stood. The purchaser was an agent of an artificial limb factory in Toronto.



White Pine Forest with an Understorey of Spruce, well Illustrating the Tendencies of White Pine Areas when Cut Over to Come Back in Other Species.

Save the Soldiers from Profitless Lands

The danger that some of Canada's returned soldiers may be settled by Government commissions on lands wholly unsuited for agricultural communities is engaging more and more public attention. In the case of Ontario, Quebec, New Brunswick and British Columbia, it is comforting to note that only lands of proved agricultural possibilities are being opened to soldier-settlers. The importance of land classification by agricultural and forestry experts is recognized and practised in these provinces to a degree that promises

well for the land settlement policies of the future. In Ontario, for example, only the splendid agricultural soils of the Claybelt are being opened to the soldier communities. All future settlement will be similarly safeguarded, as far as organized colonies are concerned. There remains the danger so long persisting in Ontario and Quebec, with its attendant waste of human effort and its ill effects upon forest conservation, that sections of timber lands of doubtful agricultural value will continue to be thrown open to settlement, thereby creating all too

frequently a scattered, impecunious, ill-educated body of population.

Unless the deliberations of the Dominion Soldier Settlement Board recognize the prime necessity of selecting homesteads for soldier settlers on the basis of expert advice by technically-qualified soil examiners and foresters, the old blunders in Canadian settlement are likely to be perpetuated. The forester, of course, would not be called into council in regard to bare prairie lands. But in all instances where the Board proposes to take slices out of existing forest reserves or to open up forested country in any part of the Dominion, the advice of a professional forester is a first essential. There is a lively tendency for laymen to leap to the conclusion that any timber-bearing land will make good farm land. This has been responsible for enormous economic losses to the Dominion and a vast deal of human misery. Of the tree-covered areas of Northern Manitoba, Saskatchewan and Alberta, probably 75 to 90 per cent. is unadaptable to farming and should be maintained under timber. The settler who tries to up set Nature's fixed arrangement impoverishes both himself and the soil from which he hoped to get a livelihood.

AN INDIAN FORESTER'S EXPERIENCE

Few Canadian foresters or fire rangers are called upon to pass through the experiences which the Indian Journal of Forestry credits to one of the British forest engineers.

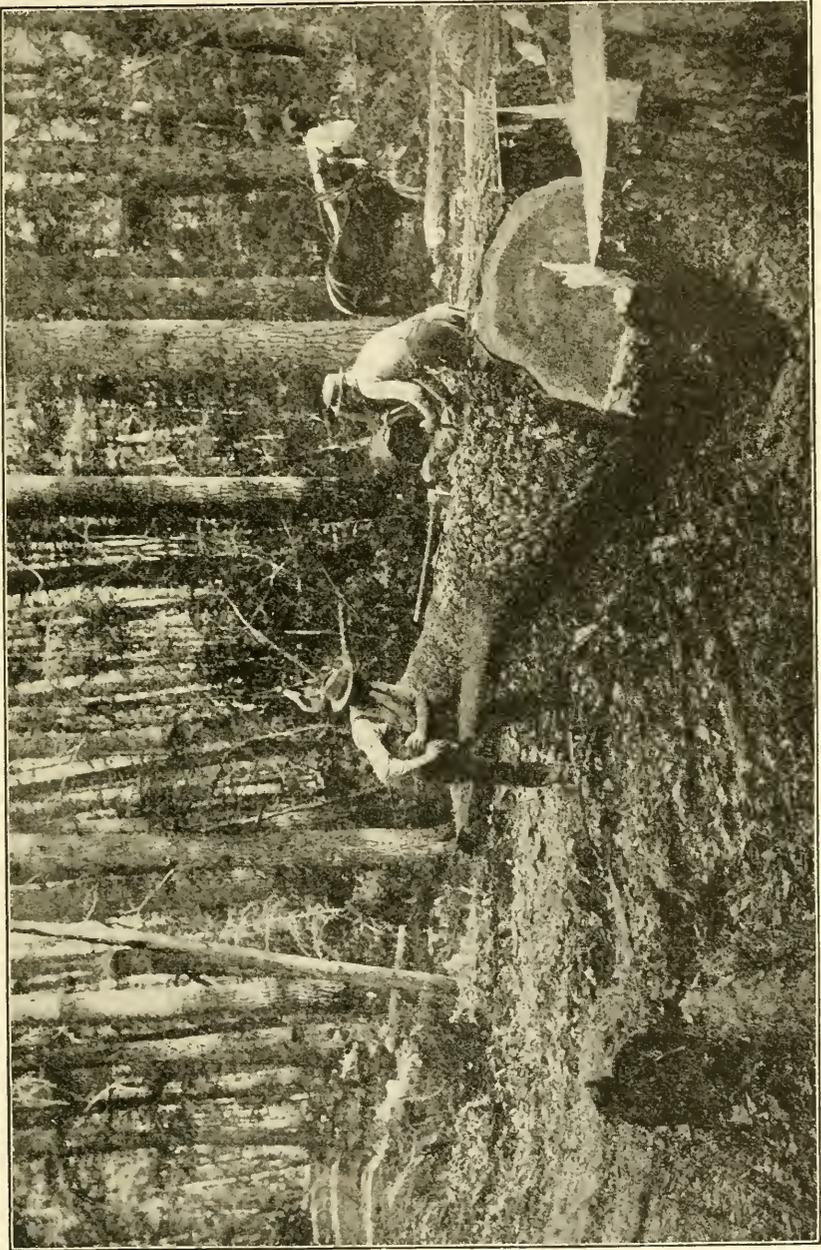
The forester was visiting a clearing in a Sal forest, and with approving hand was patting the young sal-shoots, when, raising his eyes, he saw a sambar within a few yards, gazing hungrily at him. There being no tree handy the forester didn't climb it. The officer ceased thinking of the girl he left behind him and concentrated his attention on the sambar. "Every now and then," he writes, "the sambar hammered the ground with his hoofs and his tail stuck up at right angles and looked as if it had been dabbed on as an after-

thought." A sambar is savage at any time, but when he has a perpendicular tail, it is up to any human in the vicinity to prepare for immediate dissolution. "Through a special intervention of Providence," continues the forest officer, "nothing happened. After looking me over for a little, the sambar lowered his danger signal and trotted off into the forest. He had, I fancy, recognized the service uniform, but he wasn't after me. I am young and slender, while the chief is old and fat. Apparently it was the boss the brute was laying for."

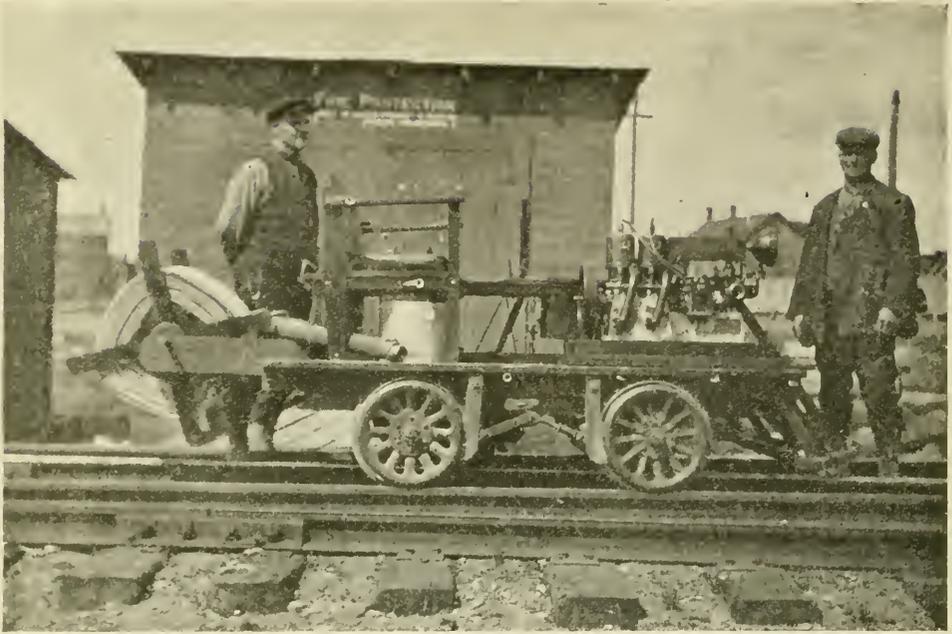
Plucking a handful of young sal leaves the forester wiped the cold sweat from his brow, and turned to leave the clearing. He immediately found himself gazing into the blazing eyes of a man-eating tiger! The position was critical, and the forester again deeply deplored the absence of a climbable tree. The tiger's tail, like the sambar's, was in evidence. But the tiger's afterthought wasn't perpendicular. It was vigorously swished from side to side and was playing the deuce with the young sals within its reach. The officer opened his coat, to get out pencil and paper wherewith to write a few last words, when—but let the forester tell his own story—"The tiger, I am of opinion, misunderstood my action. He thought, apparently, that I was about to give him a copy of the new forest orders dealing with the destruction of man-eaters, for, with a snarl of rage, he bounded off into the forest!" The intrepid man was saved! The story of the adventure concludes with these moving words, "I reached my camp and took out a bottle of Scotch. I do not mind confessing that my hand shook as I poured myself out a first-mate's nip."

SEN. CURRY'S TREES ESCAPE

The "new forest", consisting of 30,000 Norway pine seedlings, planted by Senator Curry some years ago at Athol, Nova Scotia, escaped all injury from the forest fires that have just swept that section of the country.



Returned Soldiers at Kapuskasing, Soldier Colony, Clearing their Lots in Preparation for Farming.



A Speeder that Means Business. Fire Superintendent E. G. Poole, of Cochrane, Ont., has Equipped one of his Motor Speeders with a Fender, an Electric Headlight, a Fairbanks-Morse Power Pump, and has Allowed Plenty of Room for Fire-fighting Tools. Note the Convenient Arrangement of the Hose Reel at the Rear.

Court Makes Settler Pay for Fire Damage

Quebec, June 18.—A case that interests every farmer and lumberman in the country, was closed here in the Appeal Court, when a decision of the Superior Court, condemning a homesteader to pay all damages arising out of a forest fire he caused. The case was that of Louis Collard, Joseph Villeneuve and the Factories Insurance Company against Elie Gagne. In the Superior Court Gagne had been condemned to pay Collard \$5,879.28 with interests and costs; to Villeneuve, the sum of \$834.60, and to the Factories Insurance Company \$1,600. These sums were claimed from Gagne because he was the cause of the forest fires that destroyed property belonging to the plaintiffs, the Factories Insurance Company also filing a claim for reimbursement on insurance paid.

The Superior Court condemned Gagne to pay all damages, and this decision has been maintained by the Appeal Court.

CATCHING TREE THIEVES "RED HANDED"

A reader of the Canadian Forestry Journal sends the following note regarding precautions adopted by the Chinese Government against theft of newly planted trees.

"So scarce is wood fuel in certain districts, due to China's indifference to forest protection in times past, that citizens are encouraged to plant trees by a drastic law making death the penalty for theft of saplings. I have planted many saplings myself but never without daubing them from roots to topmost twig with a red powder obtainable at any Chinese store. The object of this is that any robber touching the plant is easily traced by his red hands. The powder marks are not easily removed and form sufficient evidence to justify execution."

Riddance of Patronage a Great Gain

Dominion Forest Service now Appoints Field Staff on Merit Basis—Benefits to Soldiers.

The bringing of appointments to the outside service of the Dominion under the jurisdiction of the Civil-Service Commission under the amendments to the Civil Service Act passed at the last session of Parliament has been of great advantage already and its good effects have been felt in the forest service as well as elsewhere. The fact that the appointments of forest and fire rangers, permanent and temporary, are made through the Commission, which laid down the qualifications that would be required, placed the whole situation on a different basis and forestalled the efforts of men without qualifications and their friends to get them appointed. It also impressed on those who made a business of activity in interfering with appointments that their occupation was gone and their influence which was frequently exerted to upset discipline and efficiency in the service, has practically disappeared. Thus even the announcement of the definite adoption of the principle of Civil Service Reform has had a wholesome effect and has materially improved the spirit of the service.

Unfit Rejected

The definite results of the adoption of the Civil Service system has been that in appointments of temporary rangers or the filling of permanent positions that had become vacant only men who could show definite qualifications for the positions were considered and the appointment of the absolutely unfit or inexperienced was made impossible. In consequence, ineffective rangers have been largely eliminated from the temporary staff. The supervising officers of the forest service for the districts concerned were consulted by the Commission so as to get the benefit of their experience and local knowledge

of the men and the conditions under which they were to work and full weight was given to this evidence in determining the selection of the candidates. The knowledge that their judgment was to be given weight in the selection of the staff they were to supervise has given the supervising officers a greater interest and a better spirit in their work. The feeling of cooperation between the rangers and supervising officers has been greatly strengthened as they now are more thoroughly in sympathy in their interest in their work and their desire for efficiency.

Course for Soldiers

One important result of the adoption of the Civil Service system and an indication of how results follow one another is the establishment of a forest ranger course for returned soldiers at Vancouver in cooperation with the Military Hospitals Commission. Consideration of the establishment of a course of training for forest rangers was no new thing but action had always been hindered by the fact that even if men qualified themselves for positions as rangers, the existing system of appointment gave no guarantee that the man who spent his time and money qualifying himself would get an appointment even if there was a vacancy. Now, however, with the changed conditions, the establishment of such a course was a logical step and as the desire was to help returned soldiers first of all the Military Hospitals Commission was approached by the officials of the Forest Service on the subject, and in cooperation a course was laid out.

The lectures were given by officers of the Dominion forest service and by other foresters and a good number of returned soldiers who were found to be physically fit and took the course

successfully are now working as forest rangers and are making a success of the work.

Thus even in the first stages of its operation the Civil Service system has

helped materially the spirit and the personnel of the forest service staff and promises to add permanently to its efficiency and its spirit of public service.

Britain's Air Fleet Awaits Labor Supply

Referring to the statement of Mr. Joynson-Hicks, chairman of the British Parliamentary Air Committee, that England was preparing to launch into a tremendous campaign of airship building and fighting, the Imperial Munitions Board at Ottawa stated that Canada's organization for the production of airplane timber was complete except in one particular.

"The production of airplanes depends as much upon the supply of suitable timber as upon any other one thing," said an official of the board. "The best timber so far discovered for airplane construction is Sitka spruce, which grows exclusively on the Pacific Coast, and there only in favored localities. Washington and Oregon States have a fair area of this timber, but Queen Charlotte Island and the bays and inlets of the Mainland and Vancouver Island on the British Columbia Coast have the greatest area in the world, the trees in some districts averaging eight feet in diameter.

"Italy and France are securing their supplies in the United States while England also is buying part of her needs there.

"It is stated that 70,000 men are engaged in the woods and mills of Oregon and Washington. In British Columbia, however, the supply of labor is very limited, and only 3,200 men are now employed, though thousands more could be used.

"There is practically no limit to the necessities of England and the Allies for airplane lumber. While the actual footage required for an airplane is not great, in order to secure the quantity of the proper specifications from ten to fifteen times as much lumber must be cut. This will give

some idea of the labor involved. Yet to win victory, Mr. Joynson-Hicks says thousands of airplanes will be needed.

"The Imperial Munitions Board has a fine organization for cutting shipping and handling the logs and timber, and although our output is now four times what it was last January, we could enormously increase our production at present had we the increased labor necessary fully to operate the logging camps and saw-mills."

JOIN THE WOODLANDS SECTION!

A general meeting of the Woodlands Section of the Canadian Pulp and Paper Association will be held at Montreal in September. Papers will be given on these subjects: "Scaling"; "Driving Streams"; and "Company Camps."

Membership in the Woodlands Section is open to lumber firms as well as paper firms who are interested in the production of wood. The benefits accruing from personal association with the Woodlands Section are so obvious that no company eligible to nominate a member should lose the opportunity. A. L. Dawe, Secretary Canadian Pulp and Paper Association, Shaughnessy Building, Montreal, is the official to be communicated with in this matter.

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

Substantial Forest Losses in West

Word received by the Forestry Journal on July 19 from British Columbia states that the forest fire peril is the worst since 1910 and that rain at the date of writing was very badly needed. Experienced fire fighters were scarce and those directing the operations were working practically without sleep for days at a time. On July 11th, rain was falling generally in the coast districts, where the property loss is estimated at \$250,000.

On Vancouver Island bad fires occurred at Campbell's Bay, Chemainus, and Courtenay. At Grief Point, Bloedel, Welch and Stewart suffered a \$50,000 loss. The latter proved one of the hardest fires to combat, as two large fires simultaneously worked their way from Grief Point northward and from Powell River southward. It was feared for a time that they would meet with the resultant loss of valuable logging locomotives.

The forest fire peril which created regrettably heavy losses in Nova Scotia and New Brunswick last month has caused great anxiety in British Columbia and Alberta. While official reports are not yet available for the Forestry Journal, newspaper despatches from Vancouver claim that on July 2nd thirty forest fires were then in progress, although the British Columbia Forest Service announced officially that none of the fires was of serious extent. At the same time a public warning was given that the fire hazard was to be regarded as greater than last year when several disastrous losses occurred. Permits for burning slash had been cancelled at the end of June until weather conditions materially improved. Rain was sorely needed.

The telegraphic despatches from Calgary dated June 27th asserted that dozens of forest fires were raging in British Columbia and Alberta, and that damage to the eastern slope of the water shed was anticipated. Fifteen

fires were raging on Rest Creek, eight fires at Vernon and a large fire at Chemainus.

A despatch from Vancouver dated July 5th stated that No. 4 camp, International Lumber Company at Campbell River was burned out by forest fires and five logging engines were abandoned by their crews. If these engines prove to be a total loss, that item alone will run to \$70,000.

The "Pacific Lumberman" of Vancouver states that 3,000,000 feet of standing cedar in the Squamish Valley were totally consumed, as well as about 300 cords of shingle bolts.

The Provincial Forest Service has increased its fleet of motor cars which were found of great use in fire fighting last year.

Ontario and Quebec have enjoyed noteworthy freedom from serious forest fire trouble thus far. Quite a number of small fires have been reported in both provinces, Ontario registering 244. Of this number 175 were attributed to the railways. Permits to burn slash, etc., up to May 31st numbered 2213 of which 10,364 acres in 106 townships were burned over. The Railway Board inspection reports show that 454 locomotives within the Ontario boundary were inspected and 218 were found to be defective in their fire prevention appliances.

Districts Reduced

The Ontario department this year made several changes in the handling of the work to have closer inspection of the territory covered. In five cases the territory has been consolidated, while there were two subdivisions made, making the districts number 31 instead of 34 as last year.

The number of assistant chiefs have been increased to 41, which gives one assistant fire ranger supervision over twelve rangers. The rangers make daily reports of the weather, wind velocity, fires if any, and any strangers they meet on their patrol, and these are sent monthly

to headquarters. Owing to the earlier season this year a complete staff was put on at once.

Equipment Purchased

For the purpose of coping with any fires that might break out in the bush country, the department has purchased this year 65 canoes, 100 tents, 5 portable fire pumps, 5 boats placed on Georgian Bay, Lake Wahnapitae, Lake Nipissing, Metagami River and Lake Abitibi; 5 motor trucks stationed at Matheson, Englehart, Gowganda, Port Arthur and Dryden. These can be quickly run to the different points of danger, and in this way probably prevent anything like the disaster of three years ago.

The department has also built five chief rangers' headquarters, fourteen rangers' cabins, seven lookout towers, six docks, one railway motor car house, one boat house, 187 miles of new trail, new portages, eight miles of telephone line, and there were 45 acres of special fire hazard burned and cleaned by the rangers.

Additional information reaching the Forestry Journal from Nova Scotia shows the great need for intensive educational work along the lines of forest fire prevention. Many of the disastrous fires sweeping through parts of Nova Scotia in June were directly attributable to careless fishermen. Stories have come to hand of numbers of farmers and villagers who have lost their entire property, many of them uninsured, through preventable forest fires in the neighborhood.

Were Precautions Taken?

A timely word on Nova Scotia's losses is spoken by the Lunenburg Enterprise, as follows:

"There is scarcely any conception of the amount of property or its worth in cold cash that has been destroyed not only in Nova Scotia but in Lunenburg County during the past couple of weeks, by reason of carelessness in regard to bush fires.

They start from nobody knows where, but there is one thing evident that they synchronize with

the sportsman's visit to the woods and streams for a day of sport. A cigarette, a careless match, some dry grass or tinder for it to fall in, and there you have the whole equipment for a destroying, devastating forest fire. The same thing goes on from year to year, and all the preaching of public men and public bodies seems to have but little effect.

People deplore the high cost of living and assessment and the enormous amount of money it takes to keep things going, and then, thousands of dollars are wasted, just plain wasted. Their expenditure does nobody any good. It is a shame and it is pertinent to ask whether every precaution is taken by those in charge of the woods to prevent this annual waste or to discover those responsible for it. All will agree that the instances are rare when anyone has ever been called to account."

According to the Bridgetown, N.S. Monitor, the forest fires in Hants County have driven the wild animals out of their retreats. Bears and a large number of deer have been encountered on the railroad tracks.

PERIL IN EDMONTON DISTRICT

"There is considerable fire danger in some parts of the Edmonton district," states E. H. Finlayson, District Inspector of Forest Reserves at Calgary, according to an interview in the Edmonton Journal. "A year's total of fires is usually from 150 to 250, or more, and while most of these are confined to areas of less than ten acres each, the sum total of ground covered runs into as much as 40,000 acres. The causes of a large proportion of the fires are never known, but many of them are traced directly to settlers and campers."

Some way of utilizing the fire-killed timber on wooded lands that have been swept by these conflagrations is one of the matters to which Inspector Finlayson has given attention. "Only an insignificant proportion of this timber can be used for sawing purposes" he says, "but it is of considerable value in connection with the coal mining industry." There are billions of feet of fire-killed timber on the Alberta

slopes of the Rocky mountains, and even if all the mines in the province drew their supplies of mining timbers from this source it would not be possible to use more than a small percentage of the total. "Assuming that the next seven or eight years will see an increase of 100 per cent. in coal

production," says Mr. Finlayson. "something like a half-billion feet of board measure will suffice for coal mining operations until 1925. The question of a market for the bulk of Alberta's dead timber therefore still remains for future consideration."



Results of a Severe Forest Fire in 1906 on Head of Dungarvon River, New Brunswick. Timber and Much of the Soil Destroyed. The only Reproduction Yet Starting is Soft Maple. —Photo by G. H. Prince.

Public Pay the Cost of Forest Fires

Henry S. Graves, chief forester of the United States told the Federal Trade Commission that present cutting methods are crude and wasteful, but that fires were the greatest factor of loss so far. As systematic fire control is now operating, fires have been reduced to a minimum. The cost of this should be borne by Government and private owners.

Mr. Graves said: "If when we started using wood in paper making, fire control and scientific reforestation had prevailed, we would now have spruce enough in this country to meet our present needs without going to Canada for our supply, and newsprint paper would be cheaper. But as you must wait so long to realize the benefits of this plan, there is lacking the incentive for private owners. It is the public that is responsible for the present conditions, and it must pay the cost."

PELEE, A NATIONAL PARK

Point Pelee, the most southerly portion of Canadian territory, jutting out from the lake shore of Essex county, Ontario, into lake Erie for a distance of about nine miles, has just been created a National Park by the Dominion Government, to whom the land belonged. The creation of this park for the protection of its distinct and attractive tree and plant life and the wild life it harbours permanently and during certain seasons, was recommended by the Commission of Conservation and the Advisory Board on Wild Life Protection; the Canadian Society for the Protection of Birds and the Essex County Wild Life Conservation Association also advocated its creation.

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

HOW RESEARCH PAYS

The great laboratory of the General Electric Company at Schenectady is maintained at an annual cost of over \$500,000 and employs seventy-five investigators, including among them several who are eminent in the world of pure science. One of its products is the tungsten lamp which is now manufactured by twenty-two factories scattered over the country. This lamp, according to a very careful estimate made in 1911, was, at that time, effecting a power saving valued at \$240,000,000 per annum. Since then, the consumption of this type of lamp has increased three-fold and further research has increased its efficiency of light production nearly 25 per cent. The research workers are discouraged from thinking of financial results, as discoveries are more likely to be made by those who are working in the scientific spirit.—*Prof. J. C. Fields.*

FORESTER BUYING SPRUCE

Mr. Ellwood Wilson, chief forester of the Laurentide Company is now a member of the Imperial Munitions Board and has been assigned the task of buying aeroplane spruce.

FORESTER REPATRIATED

Lieutenant J. R. Martin, among the Canadian prisoners in Germany to be repatriated and sent home, was formerly district forester at Nelson, B.C. He was wounded four times before being captured and spent 22 months in enemy territory.

FOR RETURNED SOLDIERS

A recommendation has been made by the New Westminster Board of Trade that in the framing of a permanent policy to assist the returned soldier to return to civil life, among the courses to be given at the B. C. University, forestry should be included.

The Origin of the Christmas Tree

From "Literary Digest."

The history of the Christmas-tree is difficult to trace. It has been connected with Ygdrasil, the great tree of Norse mythology, and Christmas-trees and May-poles are known to be relics of that famous Scandinavian Ash. The roots and branches of Ygdrasil, the world-tree, or as it is sometimes called, the Tree of Time, bound together heaven, the earth, and hell. From it all tribes of nature received nourishment. According to a Scandinavian legend of great antiquity the Christmas-tree owes its origin to the service-tree which sprang from soil that had been drenched with the blood of two lovers who had been foully murdered. During the Christmas season flaming lights that no wind could extinguish sprang mysteriously from its branches at night, and the practise of illuminating the Christmas-tree may, perhaps, be traced to this tradition, which no doubt was strongly influenced by the fact that lights were (and still are) a feature of the Jewish feast of the Chanuca or Lights (December 10). Among the Greeks Christmas is called the Feast of Lights.

From the earliest times Scandinavia was inhabited by two distinct peoples—the *Svea* (or Swedes) in the north, and the *Gota* (or Goths), in the south. They spoke similar languages and were of the same stock. In the fourth century the territory occupied by the Goths extended from the Baltic to the Black Sea, but this vast state was broken up by the Huns whose hordes then overran Europe. To the dispersion of the Goths may be attributed the spread of Scandinavian customs over the continent and the fact that the Christmas-tree is sometimes said to have originated with the Germans.

Sir George Birdwood has traced the history of the Christmas-tree to the ancient Egyptian practise of decking houses at the time of the winter

solstice with branches of the date-palm, the symbol of life triumphant over death, and therefore of perennial life in the renewal of each bounteous year.

LUMBERMEN UPHOLD LABORATORIES

A few weeks ago the American Lumberman offered the suggestion that the lumber industry should recognize and appreciate the value to it and to the people of the Forest Products Laboratory, and should urge upon Congress the necessity for more liberal appropriations for its support in order that it might attain to the full measure of usefulness. It is gratifying to note that the lumber industry has taken cognizance of this suggestion and through resolutions adopted at the annual meeting of the National Lumber Manufacturers' Association in Chicago this week has requested the national legislature to provide more liberally for this branch of the United States Forest Service that is doing such an important work for the Government and for the industry.

PAPER FROM SAWDUST

A portion of the edition of The London (Eng.) "Times" is printed on paper whereof sawdust is the principal constituent. The Times says: "Sawdust is a by-product produced in Britain. It takes the place of wood pulp, the importation of which is now greatly reduced owing to Government restriction. This paper is manufactured by the Donside Paper Mills, Aberdeen, where experiments have been in progress for a considerable time and are still being carried on in the hope of effecting further improvements."

Why Forest Reserves are Created

By H. C. WALLIN, CHIEF OF SURVEYS, DOMINION FORESTRY BRANCH.

Dominion Government Desires to Protect Settlers from Poor Soils and to Maintain Timber Supply.

The objects of the reconnaissance surveys undertaken by the Dominion Forestry Branch are to procure information in regard to the value of the lands examined in relation to agriculture and as sources of water or timber supply, and to determine the advisability of recommending them for inclusion in Forest Reserve.

The prairie lands becoming settled, landseekers are now turning to the wooded districts for their homesteads. A glance at the Dominion Homestead maps will show us how every year settlement advances a little further north.

River bottom lands and lands surrounding lakes and along railroads are first taken up but gradually the settlements extend, the farms becoming more and more scattered as we get farther away from the main settlement. Experience has taught us that while generally the original settlements are well chosen, many of the homesteads surrounding them are or should be a cause of constant worry to their owners. Up in the northern country the climatic topographic and soil conditions are not as a rule favourable to agriculture. Pockets or belts of agricultural land are, of course, found but the greater part is unsuitable for farming. Many of the immigrants taking up homesteads in Canada are not farmers, many are city-born and bred and having no experience and no knowledge of soil conditions, etc., they are often induced to take up a piece of land that is not capable of supporting them in decency.

The result is that they either abandon the land after a few years or else stay there trying to eke out a bare living by doing odd jobs on the

outside. The man may be of a certain value to the community as a laborer but the 160 acres he has homesteaded are not doing their share in the development of Canada. They are idle or, if they are being tilled, they are tilled to no purpose. Instead of increasing, the land is decreasing in value on account of the timber or young growth, which usually is taken off the homestead by useless clearing or by fires started accidentally or intentionally.

To Save the Homesteader.

The prevention of homesteading on non-agricultural lands is one important reason why the Forestry Branch is anxious to have the country examined with a view to classifying the lands with regard to their suitability for farming or for forestry purposes. But it is, of course, not only the increased prosperity of agricultural Canada that we have in view in recommending the withdrawal of lands from settlement or in establishing Forest Reserves as proposed by our reconnaissance officers. The protection of merchantable timber and young growth and as a direct consequence thereof, the maintenance of a stable water flow in the watercourse is perhaps of even more interest to the forester. Thus we have another object in reconnaissance work: namely the location and ultimate reservation of valuable stands of timber or reproduction. By including these in Forest Reserves and thus placing them under the jurisdiction of the Forestry Branch we are able to afford the forest cover a better protection from fire and wasteful logging. Moreover, the timber sales will be based on rational methods.



Along the Kapuskasing River, Northern Ontario.

In addition to the determination of boundaries of Forest Reserves, the reconnaissance surveys help us to gain a knowledge of the character, extent and material value of the forest growth in the country examined. We obtain maps which show us the topography of the country and the location and relation of site and cover types; we are furnished with reports which in addition to matter relating to soil, forest growth and proposed reserve boundaries, give us valuable information in regard to logging, fire protection, game and other matters which bring themselves to the forester's attention during the course of the working season.

Prairie Sand Lands

To prevent homesteading on non-agricultural lands, the Branch has generally endeavoured to undertake the reconnaissance in advance of settlement. This has, however, not always been possible, especially in regard to the sandy areas in southern Saskatchewan where unfortunately numerous homesteads have been granted, which on examination were found to be absolutely unfit for permanent agriculture.

The principal object of the reconnaissance survey is accordingly to

classify the land in regard to its relative value as agricultural land or forest land and to locate the boundaries of any area which on account of its character is deemed advisable to recommend for inclusion in a Forest Reserve.

Two Classes of Reserves

The Forest Reserves of the Dominion are of two kinds:-

1. Forest Reserves in well populated districts.

2. Forest Reserves in rugged and mountainous country or in the practically unsettled and largely unsurveyed country north of the prairies.

Forest Reserves in populated districts generally consist of sandy, more or less timbered and as a rule hilly country surrounded on all sides by settled agricultural land. Such reserves are for instance the Moose Mountain, the Elbow, the Cypress Hills, and other Forest Reserves in the southern portions of the prairie provinces.

A survey of such an area must naturally involve a very careful examination of the soil conditions especially in the transition area between the interior non-agricultural and the surrounding agricultural lands. For that reason it is necessary that

the officer, to whom the work of examining proposed Forest Reserves of this character has been entrusted, has more than the ordinary knowledge of soils. Every quarter-section must be carefully examined and a correct classification of the land by climate, topography, and soil into agricultural and non-agricultural land made. Lands that are positively adapted for continuous production of farm crops or are chiefly valuable for agriculture should be excluded, while lands that are undoubtedly non-agricultural or lands that possess minor agricultural possibilities but are more valuable for the growing of crops of timber should be included in the proposed reserve.

Providing Farm Needs

Areas unfit for farming in the settled portions of the central provinces are comparatively few, and it is of great importance that all available land of this class be devoted to the growing of timber, thus to relieve to a greater or less degree the need of firewood, fence posts, and small building timber, which always is felt in the treeless prairies.

Proposed forest reserves in unsettled districts do not require such a careful examination. The reconnaissance in this case is more in the nature of an exploration in contrast to the survey of the proposed reserves in the old settlements which really takes the form of a more or less intensive soil survey. Here large areas of unsettled and largely or entirely unsurveyed lands are involved and anything but a rapid reconnaissance is at the present time impracticable and out of the question. This does not mean, however, that care should not be exercised by the forester in determining proposed reserve boundaries. On the contrary the future possibilities of the land should be considered and the inclusion of agricultural land should, wherever it appears in appreciable quantities, be avoided unless its temporary reservation is considered advisable until such time as the present crop of timber thereon has been removed.

Isolated small areas of good farmland in the interior of the proposed reserve which cannot be eliminated from the proposed reserve by any readjustment of boundaries may, however, very well be included until a soil survey of the reserve can be made.

A survey of this kind is, of course, only preliminary. Its principal object is to have defined by settled lines and placed under the jurisdiction of the Forestry Branch a tract of lands which is (in the main) non-agricultural and is or will become, if properly protected, of considerable value as forest land.

Cultivate Public Opinion

The officers in charge of a reconnaissance party should always make it a point to acquaint himself with the views held by settlers that live in the vicinity of the proposed reservation, in regard to the establishment of a Forest Reserve. He should explain to the farmers that the creation of a Forest Reserve means protection of timber, grazing, and water supply for the use of the farmer himself. The idea is here and there prevailing that a Forest Reserve is created to prevent the "poor man" from getting his supply of firewood and building timber. This opinion, which of course tends to make the Forest Reserves unpopular, should be discouraged.



Excellent Type of Farm House being Built by the Ontario Government for Accommodation of Soldier-Settlers at Kapuskasing, Northern Ontario.

The Pejepscot Plantations

In an article in the New York *Paper Trade Journal* Julian Rothery points out that forests, vast as they are, are not unbounded, and that the amount of pulp-wood available in this country and Canada which will permit of manufacture of reasonably cheap paper is not bottomless. He gives some interesting facts about what one paper firm has done in the way of reforestation and how its nurseries are conducted. To quote Mr. Rothery:

"The Pejepscot Paper Company is one of the old established manufacturers, with mills on the lower Androscoggin River in Maine and extensive timber lands both in Maine and Canada. It was also among the foremost to embark on a far-sighted policy of conservation, and its New Brunswick holdings constitute the finest spruce forest the writer has ever seen and probably the finest in eastern

America. Due to careful methods of cutting, there is more timber upon the lands today than when operations were commenced many years ago. But it is the reforestation of the barren or open lands where conservation is the most direct and aggressive. The Pejepscot Paper Company established nurseries at several places in its woodland properties.

"Thousands of these young trees have been set out in the old pastures and clearings and are slowly filling up gaps in the woodland cover. The cost is not heavy; the returns, both direct and indirect, are sufficient to make it an object to continue the work each year until now, when the open areas of their large Canadian properties are nearly all restocked with valuable growing trees. They find planting is educational as well as practical, tending to promote care of the forest and impress upon observers the value of trees and forest cover."

Can Forest Revenues be Maintained?

The point is frequently raised in connection with Canadian forestry policies that our Provincial governments will soon be obliged to return to the forest a much larger percentage of forest revenues than is now turned over to maintenance of timber materials. Indeed, the argument is frequently put forward that the day is fast approaching when the Provincial Governments instead of extracting surpluses each year from the forest resources may be forced to turn over to their Forest Services every dollar of revenues so as to provide a supply of raw materials to support the forest industries.

West Australia recently launched a strong forestry movement and in "Jarrah" the official mouthpiece, asserts that the system of extracting revenues from forest exploitation,

with almost no provision for maintenance of timbercrops, must cease. West Australia has reduced its forest area to about 3,000,000 acres, out of a total area of 975,000 square miles, and only 12,000 acres have been reserved. The export of forest products in 1913 brought 1,183,000,000 pounds sterling and only 12,000 pounds were spent on the Department of Forests.

"What business in the world could stand a system of management which aimed at taking all the profits and putting nothing back to consolidate, and improve the business and assure its future. Here is the most permanent and certain of all the primary industries, one which, under proper management will be yielding its timber in increased, not diminished volume long after the last ounce of gold has been won from the earth,

treated as of no importance and allowed to starve for lack of a sound forest policy."

The Forest Policy of West Australia is given as follows:

1. Demarkation and permanent reservation of the prime timber country.

2. The regulation of the cutting of timber so that only that quantity is cut annually which can be replaced by the natural growth of the forest.

3. The improvement of all cut and semi-cut out areas with a view to assuring the regeneration of the best species for future cutting.

A Wood Fuel Scarcity in Ontario

If Peel County, Ontario, may be accepted as typical of other counties in that province, the outlook for wood fuel supply for the coming winter is hardly cheering. Notices have been sent out to the farmers and others by the Provincial Fuel Controller urging the laying in of a supply of anthracite coal and cordwood at the earliest possible moment. This appeal may have some effect on the cutting of wood fuel late next Fall but at present the farmer's sole attention is given to securing all the anthracite that his local dealer can import. At Brampton, for example, dealers have found the farmer so obliging in teaming the coal to his farm direct from the railway siding that the townspeople have yet to get their first "look-in" on a winter coal supply. Other towns and villages have had a similar experience. The farmer is rapidly picking up all the coal in sight, while those who lack any means of transport are waiting their first chance at anthracite fuel.

In Peel County, a good quantity of fuel wood was cut last winter for home use. It is stated that the amount available for sale to townspeople will be negligible. A few weeks ago, a farmer seventeen miles from Toronto purchased two car loads of cordwood at \$10.50 a cord f. o. b. and the net cost delivered in his own farm yard was \$12.50 a cord.

Any visitor to rural Ontario is aware of many communities where cord wood is going to waste in woodlots while the owners and neighbors are frantically reaching out for coal. Labor scarcity doubtless has much to do with the present situation. For

example, an Ontario farmer, owning an excellent lot of maple and elm, offered fifty per cent. of the wood to any man who would come in and do the cutting; he has not had a single response thus far.

\$65,000,000 FIRE BURDEN

Up to the present, the fire loss of the Dominion of Canada is 25 per cent. greater than for the corresponding period of last year. If this rate of destruction continues, the loss will exceed thirty-two million dollars in 1918, and, together with expenditures upon insurance and fire protection, will constitute a burden of over \$65,000,000. This means about \$10 out of the pocket of every man, woman and child in Canada, or almost \$40 for the average family.

WOODMEN AS RANGERS

The New Brunswick Government is advertising for experienced woodmen to act as forest rangers—one of the gratifying signs, points out The St. John Globe, of the new era of forest management in the Province. New Brunswick sets an example in principle which other Provinces would do well to follow in all departments of Government.

FOREST FIRES SAVED APPLES?

Says the Lunenburg, N. S. Record: "It is an ill wind that blows nobody good," was truly exemplified last week when the smoke from the forest fires settled, it is said, like a pall over the Annapolis Valley and saved the apple blossoms from frosts.

Canada's Pulpwood Resources

The following table shows the approximate amounts of certain classes of pulpwood material now standing in the several provinces of Canada. All sizes of the species named are included; It represents, to some extent, a compromise between the guesses made by various individuals or organizations in the past, and information relating to the partial areas based upon investigations actually made in the field.

	Cords	
Nova Scotia	30,000,000	spruce and balsam.
New Brunswick	33,000,000	spruce and balsam.
Quebec	300,000,000	spruce and balsam.
Ontario	200,000,000	spruce and balsam.
<hr/>		
Total for Eastern		
Canada	563,000,000	cords.
Prairie provinces ..	85,000,000	spruce and balsam.
Prairie provinces ..	100,000,000	poplar
British Columbia ..	285,370,000	Sitka spruce, western hemlock, balsam and cottonwood.
<hr/>		
Total for Western		
Canada	470,370,000	cords.
<hr/>		
Total for all		
Canada	1,033,370,000	cords

In considering this table certain allowances must be made in arriving at commercial possibilities. In the first place, vast amounts of materials of suitable size for pulpwood are so situated as to be commercially inaccessible. In other cases, bodies of timber of limited size are so scattered as to make profitable operation impracticable. Further, balsam does not float readily for long distances, and heavy loads result from sinking where long drives are necessary.

Another factor, sometimes overlooked, is the heavy demand upon these forests for purposes other than the cutting of pulpwood. The greatest of these is for the manufacture of lumber, for which very large amounts of spruce and balsam are used annually in eastern Canada.

KILLING FARM WOODLOTS

(Kitchener "News Record")

In the past Waterloo county, like all other counties in older Ontario, has been prodigal in its cutting of trees in its woodlands. Were proof of this needed, the annual flood and batches of complaints from inundated municipalities along the Grand River furnish it.

There is presently a strong temptation offering all owners of bush land to cut down trees for firewood, owing to the scarcity of coal. This demand cannot be wholly ignored. Yet before the comparatively few remaining patches of woods are levelled, the best forestry practise should be followed.

Those who "kill the goose that lays the golden egg," are frequently quoted. Alongside of them should be placed those who have indiscriminately cleared their bushlands.

Had a wiser policy been pursued, they would have obtained greater money returns from their bushlands and still have them. Conservation and reforestation would have wrought this gain.

MR. POWER'S ANNIVERSARY

Mr. William Power, of Quebec, is celebrating the 60th anniversary of his connection with the well-known lumber firm of W. & J. Sharples, of which organization he has been President for many years. Mr. Power is a former President of the Canadian Forestry Association.

The Inroads of Timber Substitutes

BY M. A. GRAINGER, CHIEF FORESTER OF BRITISH COLUMBIA.

"It is not merely a question of finding new markets for British Columbia lumber to be sold in. It is a question of protecting the markets we've already got. Where would the province be if any serious proportion of its existing lumber business were wiped out? It couldn't happen, you'll say. People have got to buy lumber. It's a staple article, like wheat. Well, they've been carrying on a searching investigation into the lumber trade of the United States, and this is what they've found as a result: Just one-fifth of the entire lumber market that existed eight years ago has been wiped out. Wiped out by substitutes: steel, concrete, bricks, patent roofing, asphalt paving; wiped out in some cases because the substitute was the better article, but in far too many cases simply because the makers of substitutes used modern selling methods and the lumbering industry did not.

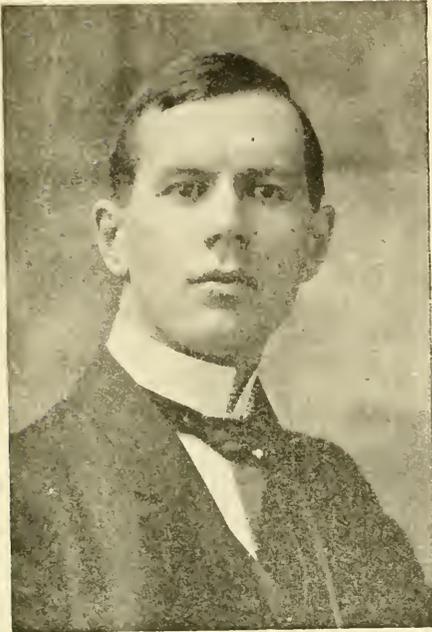
There is no better selling method than giving good service to the consumer, helping him to use your material and to get the best value out of it. That is the method adopted in this province. Many a sale of British Columbia lumber has been made to prairie farmers who have been supplied with building plans, and bills of material showing them how easily and well they can build barns or sheds or chicken houses with British Columbia lumber. And, just as we have done in this case, we hope to cooperate with lumbermen and get all the best selling methods carried out in this community effort to increase the sale of British Columbian lumber. In short, persistent market work is one of the most practical methods of forest conservation there is.

Our American friends are engineering some progressive ideas. For instance, in the interest of forestry they've allowed the export mills of the Pacific coast to form a selling

combine, the Sherman law notwithstanding, and they are sending five lumber commissioners to strengthen their grip upon European and other markets. It is interesting to note that these five have been selected from candidates who have been put first through a series of severe practical examinations—a new idea in foreign commercial service, and a great change from the time honored method of giving foreign commercial jobs to good Americans with a pull."



A. H. Beaubien, B.A., Ottawa, working under the auspices of the Canadian Forestry Association, spent three weeks in holding public meetings in Western and Northern Quebec, in the territory of the Ottawa River Forest Protective Association. Mr. Beaubien met with remarkable good fortune and was greeted by large audiences. All lectures were illustrated by stereopticon.



J. André Doucet, B.A., B. Sc. F. Forestry Branch, who by courtesy of the Director of Forestry and acting under the auspices of the Canadian Forestry Association, held twenty well-attended public meetings in Northern New Brunswick. The lectures were illustrated by stereopticon. The message of forest protection and forest maintenance was brought forcefully to the attention of thousands of French-speaking citizens.

Victor Baillaigé, B.A., a graduate of Laval Forest School, and employed in the Quebec Forest Service, undertook a busy itinerary of five weeks in the territory of the Laurentian Forest protective Association, from the St. Lawrence through the Lake St. John region and down the Saguenay. Mr. Baillaigé appeared under the joint auspices of the Quebec Department of Lands and Forests, the Canadian Forestry Association and the Laurentian F. P. Association. His tour was attended by a lively public interest, and large audiences were met at most points.

A PROPHECY OF 1656

An interesting prophecy of Great Britain's drastic experiences in procuring timber supply from her own lands is contained in "the Gentleman Farmer," by Henry Home, Lord Kames, published in Edinburgh in 1776.

"Considering the great quantity of waste land in Scotland, fit for only bearing trees, and the easiness of transporting them by navigable arms of the sea, one cannot but regret the indolence of our forefathers who neglected that profitable branch of commerce, and left to us the necessity of purchasing foreign timber for every use in life."

Gabriel Plattes, in his "Practical

Mr. Gustave C. Tessier, whose portrait is not available for this issue, undertook similar work in the territory of the St. Maurice Forest Protective Association, and met with first-rate success.

Husbandry," published in 1656, says: "Now the multitude of Timber brought yearly from *Norway* and other parts does plainly demonstrate the scarcity thereof here: also it may be conjectured what a miserable case the Kingdom will be plunged into in an Age or two hence, for want of Timber."

The Function of Watershed Forests

The effect of the forests upon Canadian streams does not require scientific data to prove its reality. Every observer who has compared the flow and uniformity of streams under contrasting conditions of forest growth on the watersheds knows that tree life is a conservator of surplus moisture and a mighty aid in the regulation of the Spring run off.

In this connection it will be interesting to many readers to note the conclusions of Mr. Raphael Zon, Chief of Sylvics, U. S. Forest Service, Washington, after a very thorough examination of available evidence in the United States and foreign lands.

"The available observations upon the behavior of streams in this country and abroad have established the following facts:

1. The total discharge of large rivers depends upon climate, precipitation, and evaporation. The observed fluctuation in the total amount of water carried by rivers during a long period of years depends upon climatic cycles of wet and dry years.

2. The regularity of flow of rivers and streams throughout the year depends upon the storage capacity of the watershed, which feeds the stored water to the streams during the summer through underground seepage and by springs. In winter the rivers are fed directly by precipitation, which reaches them chiefly as surface run-off.

3. Among the factors, such as climate and character of the soil, which affect the storage capacity of a watershed, and therefore the regularity of streamflow, the forest plays an important part, especially on impermeable soils. The mean low stages as well as the moderately high stages in the rivers depend upon the extent of forest cover on the watersheds. The forest tends to equalize the flow throughout the year by making the low stages higher and the high stages lower.

4. Floods which are produced by exceptional meteorological conditions can not be prevented by forests, but without their mitigating influence, the floods are more severe and destructive.

Delusions Must Give Way to Facts

(Dominion Advisory Council on Industrial and Scientific Research.)

"It should be understood that there is only one way of keeping the forest resource inexhaustible, namely, by means of reproduction.

"We know next to nothing as to whether, and to what extent, the cut-over lands are reproducing the timber that has been removed, still less at what rate such new crop is growing.

"General principles of silviculture can be imported from Europe and, in so far as the same species occur in Canada that are found in the United States, we can profit to some extent from the work of their foresters: finally, however, climatic and soil

differences make it necessary to learn how to manage the species under their home conditions. We have in Canada not yet undertaken the first systematic study of the biology of any of our species, a knowledge fundamental to its silviculture. This is to be accomplished by observation in the field and by a systematic location of permanent sample plots placed under different treatment and observed periodically.

"As regards increment, the rate of production that may be expected from our species under varying conditions, we are also lacking in knowledge. There are neither volume

tables as aids for timber estimating nor growth or yield tables as bases for calculating the results of our silviculture in existence. Meanwhile, truly foolish ideas prevail regarding the rate of growth of forest trees and forest acres. A correction of these ideas through systematic measurements will bring the wholesome reali-

zation that the replacement of our cut timber takes many more years than is generally believed. We may add that these investigations are most urgently needed for the species of the eastern provinces, which have already been largely exploited and where recuperative measures should be applied at once."

Keep the Woodlot for Future Needs

By "Ahmik" in *Toronto Globe*.

The importance of a well-thought-out system of forest conservation in connection with land settlement cannot be too strongly emphasized. We all realize now the evil effects of over-clearing of land in older Ontario. There has been over-clearing even of good agricultural land; some land wholly unfitted for agricultural production, that should have been left in permanent forest, has been stripped clear of timber. As a result, over a vast territory once rich in wood, people would be in danger of freezing to death were it not for imports of coal from the United States. Despite the lesson so taught there are considerable areas in New Ontario, north of New Liskeard, opened up only yesterday, in which the fuel problem is already almost as acute as it is in older Ontario. We should see that the folly shown in these two cases is not repeated in that vast territory stretching some 400 miles west of Cochrane, a beginning on the opening of which has been made by independent settlers, stringing out along the line of the Transcontinental, and continued by the returned-soldier farming colony, farther west along the same line. In practically every case, land occupied along this line has been completely cleared as far back from the railway as cutting has gone. No such avenues of trees as have been planted here and there along the roadsides in older Ontario have been left along the right-of-way or where the lanes will lead up to the houses.

There is no evidence of preparation for the leaving of wood lots as a permanent source of lumber and fuel supply for those making homes in that country. It should be part of the conditions of sale that in all cases a certain proportion of the land allotted settlers shall be reserved for permanent timber growth.

NEW PAPER-MAKING PROCESS

From Queensland come reports of successful experiments in manufacturing paper pulp out of "lalang" grass, which resembles very closely the "esparto" of Spain and North Africa, and which when dried before making it into pulp yields as high as sixty per cent. of first-class paper-making pulp. The expert states that esparto is the best pulp known, and the lalang grass product is within ten per cent. of the same value. There are millions of tons of this grass growing in Queensland. Three crops a year can be cut from it, and this plant is said to be otherwise a curse to the country. Chinese "barr"—Urena—and the Queensland hemp—*Sida Retusa*—are said to produce thirty per cent. of first-class paper pulp. Lantana, which is also regarded as a great pest, makes an excellent wrapping-paper.

Cellulose from seaweed and a paper milk bottle are the latest additions to the paper industry extension.

For Every Acre a Proper Crop

SIR RONALD MUNRO-FERGUSON, GOVERNOR-GENERAL OF AUSTRALIA.

"One of the considerations which I venture to submit is the need for the allocation of land for agriculture upon the one hand and silviculture on the other. I have seen in some States great destruction wrought by individual pioneers who did not always make a success of their undertakings, and I have seen abandoned holdings in the middle of destroyed forests—which, in their way, had been perfect of their kind. Whatever land is suitable for agriculture should be kept

for agriculture, and where it is suitable for forestry, and not for agriculture, then it should be kept for forestry. That can only be done by survey, and after the survey, then classification, and then will come the question of forest reserves and the establishment of areas suitable for forestry as permanent reserves, and the issue of regulations sufficient to insure and preserve the safety of these reserves."

New Settlers Must Take Out Permits in West

According to an important order-in-council passed by the Dominion Government on May 7, 1918, all persons taking up a homestead on Dominion lands in a wooded district (outlined in the order-in-council) or within six miles of a forest reserve or timber berth must take out a permit from a forest ranger before setting fire to clear land.

Manitoba and Saskatchewan Governments have already applied a similar provision to all settlers under provincial jurisdiction so that the Dominion order-in-council will blanket all settlers now on patented lands or who may take up lands in the future. Alberta has yet no law enforcing the permit plan on owners of homesteads: the Dominion measure will affect only those who may take up lands in future.

926 PAPERS SUSPENDED

In the investigation before the Federal Trade Commission in the United States the statement was made that in 1917 no fewer than 926 newspapers in the United States and Canada suspended publication while

250 others were eliminated by consolidation.

FORESTRY BOARD COMPLETE

Archibald Fraser, of Fredericton, has been appointed by the Minister of Lands and Mines, representative of the private timber land owners upon the Forest Commission which is to have charge of the crown lands of New Brunswick, under the legislation passed at the last session of the Legislature. The other members are: Hon. E. A. Smith, Lt. Col. T. G. Loggie, Deputy Minister of Lands and Mines; G. H. Prince, Chief Forester; D. J. Buckley, representative of the holders of timber licenses.

The Abitibi Power and Paper Co., of Iroquois Falls, Ont., is now turning out daily about 425 tons of paper and pulp all told but after the war when additional paper making machines are installed, the output of newsprint alone will be about four hundred and fifty tons, making the largest production under one roof of any paper company in the world.

Forest Legislation in Canada 1917-18

A Resume of Public Measures in the Provincial and Federal Fields.

In New Brunswick

The **FOREST SERVICE ACT** creates a Forest Service in the Department of Lands and Mines and empowers the Minister to appoint a technically trained Provincial Forester. The Forest Service is to administer all statutes and regulations *re* Forestry, Hunting, Fishing, Forest and Game Protection, have charge of the protection of the forests from fire, the construction and maintenance of all permanent improvements (roads, telephelines, etc., etc.) and reforestation.

A Forest Advisory Commission is also created to consist of the Minister of Lands and Mines (Chairman), the Deputy Minister of that department, the Provincial Forester, one lumberman to represent the licenses and another lumberman or forester to be named by the Minister, who must be "associated with the ownership or management of the Crown-granted forest lands." The functions of the Commission are to advise in regard to administration and to supervise all permanent appointments. All permanent appointments and, as far as possible, temporary appointments, are to be by examination conducted by an Examining Board, comprised of the Provincial Forester, and two others, all appointments to be approved by the Commission after a six months' probation. A Protection Fund, to amount to \$100,000 per year, is created, made up as follows:- (1) \$30,000 of the revenue collected under the Wild Land Tax, (2) half a cent. per acre on all timber areas under license (the Forest Protection Tax), (3) fines and fees under the Forest Fires Act and the Game Act, (4) balance to be provided from Consolidated Revenue Fund. Any balance at the end of the year is to be placed in a Protection Sinking

Fund, to be used in case of emergency. Permanent forest rangers are given all the powers of special constables.

N. B. Forest Fires Act.

The Forest Fires Act provides for a closed season (April 15 to October 15) to be lengthened if necessary, during which no one may set out a fire (except for cooking or warmth) within half a mile of any slashing or debris, fallen or standing timber or brush land, until he has obtained a permit from a forest officer. Precautions to be taken when starting a fire are stated. Penalty is provided for any person leaving a fire burning so as to endanger the property of another person, and for carelessness, in dropping lighted matches or pipe, cigar and cigarette ashes. No person may start a fire on any land not owned by him, except with the owner's consent. Any person neglecting to do his utmost to prevent a fire from spreading is made an offender under the Act and liable to all expenses incurred in extinguishing it. Forest officers are empowered to compel the services of all males between eighteen and fifty years for extinguishing a fire. The Minister is given power to destroy any material which constitutes a fire danger. Debris around camps, mines, saw-mills and engines must be cleared up, brush and debris resulting from clearing all rights of way must be burned and any accumulation of inflammable debris within 300 feet of the centre of a railway must be burned; if this is not done, the forest officers are given authority to destroy such debris at the expense of the person interested. Watchmen are required during the close season for stationary or portable engines in a forest. Every adult is required to report fires, when known.

Railway Safeguards.

During the close season all steam engines (locomotive or stationary) operating inside of, or up to a quarter of a mile from timber must have spark arresters and devices for preventing the escaping of fire or live coals from ash pans or fire-boxes, burners, chimneys and smoke-stacks must have spark arresters, and open waste-burners must be properly safeguarded. During the close season fire-fighting tools must be kept ready for use, and no locomotive or engine may dump fire or live coals unless these are immediately extinguished. Railways under provincial jurisdiction passing through forested land are specially provided for, and no existing statute regulating them is repealed or at all interfered with. Locomotive engines must have the most approved fire-protective apparatus, and every engineer must see that these appliances are properly used and applied. The right of way must be patrolled at least once a day and must be kept free from dead or dry grass or weeds and other combustible matter. Extra patrol may be ordered by the Minister when deemed necessary, and if his instructions are not carried out the patrol may be established at the expense of the company. Railway companies are made responsible for all fires within three hundred feet of their right of way, unless they can prove the fire not to have been caused by the Company or its employees. No railway company completing the construction of a line after the passage of the Act may operate locomotives on the line until the Minister has certified that the right of way has been cleared of inflammable material. The Minister may appoint fire rangers, under a Chief Ranger, to patrol railways under construction. Railway companies must put their employees at the disposal of the Chief Ranger to assist in extinguishing fire. Nothing in the act is to be held to limit the right of any person to bring civil suit for damages caused by fire.

Wild Lands Tax Act.

Provides for a tax on all wild lands

exceeding five hundred acres of one cent per acre when held by residents of the province and two cents per acre when held by non-residents. Part of the funds realized are to be paid over to the Protection Fund created by the Forest Act as above noted.

The Act prohibiting the export of pulpwood from Crown Lands was amended by adding to the "Manufacturing Clause" a statement to the effect that cutting such wood into cordwood or other lengths and "rossing" or peeling the bark, were not "manufacturing" within the meaning of the Act. Poplar wood is also restricted from being exported. Unmanufactured pulpwood grown on ungranted Crown lands may be exported to the United Kingdom until two months after the declaration of peace.

Dominion Lands

The Dominion Forest Reserves and Parks Act was amended to provide (1) that where existing road allowances are, for topographic reasons, found unsuitable, the Provincial government may be permitted, by Order in Council, to exchange these for suitable road allowances, and (2) that the government of British Columbia be given the right to the non-precious metals found within the Forest Reserves.

The Forest Reserve Regulations were amended in a number of particulars, the general tenor of the amendments being as follows:-(1) The regulations in regard to timber permits were changed so as to provide that the quantity of timber so granted should be limited, not by a specified quantity of timber of each class, but by a certain amount of dues, thus allowing greater latitude as to the respective quantities of the various classes of timber that can be taken out, (2) trespass is more clearly defined, (3) Regulations in regard to the use of fire are improved; (4) Regulations in regard to operation are improved in some points, (5) Regulations as to the granting of permits for the cutting of *dead* timber on the forest reserves are made more elastic so as to give every encourage-

ment to permittees to remove it, (6) the regulations in regard to grazing and hay are made more specific.

In Ontario

The Forest Fires Prevention Act was amended by providing for the appointment, at the request of the owner (i.e., the licensee of an area or any person having the right to cut timber on the land) of extra or special rangers to be paid by the owner as directed by the Minister of Lands, Forests and Mines.

New regulations for forest reserves were promulgated under the Forest Reserves Act. These forbid the disposal of land within the reserves for agricultural purposes altogether, and for prospecting and mining, hunting and fishing except under the regulations. Persons travelling through the reserves must give to any forest officer, when required, particulars as to themselves and their business in the reserve.

Mining Prospectors operating in reserves must have yearly permits. No lands valuable for the timber thereon may be disposed of for mining purposes and all timber cut on lands so leased must be cut under regulation of the Minister. Mining operations on reserves must have the permission of the Minister and no ores containing sulphur may be roasted in the open air in forest reserves. No tree may be cut, barked or otherwise injured except under written authority of the Minister. Precautions must be taken in setting fire and all fires kindled in the reserves must be extinguished before being left. Locomotives passing through the reserves must have spark-arresters or other efficient means of preventing sparks escaping. Making roads, erecting buildings and other improvement work may be done by the Minister, and no such work may be done without his written permission. A Superintendent and rangers may be employed for each reserve. All guides in the reserves must be licensed. Nominating lease may issue for work in the reserve until all development work has been com-

pleted. The Game Act is by Order in Council made to apply to forest reserves.

In Quebec.

An order in Council of June 12, 1918, makes a number of increases in dues and rents to be paid by licensees in the province, for the years 1919-20 to 1923-21, with further increase for the years 1924-25 to 1928-29. By this Order in Council the ground rent is increased from five dollars per acre to six dollars and fifty cents for the years 1919-20 to 1923-24 and eight dollars for the years 1924-25 to 1928-29. In most of the specified classes of timber the increases run from thirty up to one hundred per cent; on miscellaneous timber the due is a straight fifteen per cent. The further increases dating 1924-28 will give a further increase on the 1918-19 to 1922-23 prices of twelve and a half to sixty per cent.

In Alberta.

The timber Areas Act was amended so as to provide that anyone owning, leasing or operating any timber area who fails to give the Minister of Municipal Affairs any information called for by the latter shall be liable to a fine up to \$50 and costs, or in default, to imprisonment not to exceed six months and giving the Minister power to assess the area after getting information from the Government of Canada or otherwise.

A number of amendments, chiefly as to matters of administration, were made to the British Columbia Forest Act.

Saskatchewan reduced the tax on timber areas or berths (payable by owner or operator) from one and a half cents to one cent per acre, areas held under permit exempted. Persons who manufacture lumber from trees cut on their own timber areas may be granted a rebate of all sums over and above half a cent per acre, paid or payable during 1913 and subsequently.

No change in forestry legislation is reported from Nova Scotia or Manitoba.

Quebec Raises Dues and Ground Rent

An increase in timber dues and ground rent has been ordered by the Quebec Department of Lands and Forests and will have an appreciable effect upon the wood-using industries, as well as adding substantially to provincial revenues.

The Minister in a memorandum dated June 12th, recommends the following modification of the Order-in-Council, April 26th, 1910:—1. That the annual ground rent per square mile or fraction of a square mile payable on the issue of licenses to cut timber be of six dollars and fifty cents for the years 1919-20 to 1923-24, both inclusive, and of eight dollars for the years 1924-25 to 1928-29, both inclusive, nevertheless, the rent of ground rent may, at any time, be increased for license-holders who do not operate on their limits, the Crown reserving the right to fix the quantity of timber to be cut to constitute sufficient lumbering operations; 2. That all wood cut in virtue of a license during the lumbering seasons 1918-19 to 1922-23, both inclusive, and 1923-24 to 1927-28, both inclusive, be subject to the following charge:

1. Square, waney or flat timber, per cubic foot:

(a) White pine, oak, hickory and walnut	0.08	0.10
(b) Red pine, elm, ash, cedar, basswood, birch, maple, tamarac	0.06	0.08
(c) Spruce, balsam, grey pine or banksian pine hemlock, white birch, aspen, poplar	0.04	0.06

11. Saw logs and boom and timber dimension in the raw state, per thousand feet, board measure:

(a) White pine, oak, hickory, walnut	2.60	3.00
(b) Red pine, elm, ash, basswood, birch, maple, tamarac	2.00	2.00
(c) Spruce, balsam, grey pine or banksian pine hemlock, white birch, aspen, poplar	1.60	1.80

(d) Cedar..... 1.40 1.40

111. Poles more than 18 feet in length, not exceeding 10 inches in diameter at the small end, each:

(a) 30 feet and less in length

0.25	0.40
------	------

(b) 30 feet and less in length

0.50	0.75
------	------

(c) 41 to 50 feet in length

1.00	1.50
------	------

(d) 51 feet and over in length

2.00	3.00
------	------

IV. Railway ties or sleepers not exceeding 9 feet in length, each

0.10	0.10
------	------

v. All other wood goods, ad valorem

15%	15%
-----	-----

PERPETUATION OF PULPWOOD

W. F. V. Atkinson, chief forester of the Spanish River Pulp and Paper Mills, Sault Ste. Marie, states that what C. D. Howe, Ph.D., in an article in the Pulp and Paper Magazine entitled "Forest Regeneration on Certain Cut-Over Lands in Quebec," says with regard to certain districts on the St. Maurice River in Quebec is subject of course to local conditions, generally applicable to parts of the Province of Ontario." It is absolutely essential to the perpetuation of Ontario's pulpwood areas that detailed studies be made and regulations worked out after these studies, if the pulp wood of the province is to be perpetuated for any length of time. The regulations will have to include, among other plans, that of the Crown securing the services of a large number of forest assistants of all grades, amongst the duties of whom will be that of marking only such trees as can be properly harvested. This entails a change in methods of such a radical character that it does not appear likely to be adopted for some time to come, or, at least until after the war."

Railway Roadmaster Sets Good Example

If all railway roadmasters would imitate H. B. Cassidy, in charge of the Canadian Northern line from Quebec to La Tuque and Chicoutimi, railway fires would be of less frequency. Following is a copy of instructions sent by Mr. Cassidy to all section foremen.

In case of fire I want you to assist the Fire Rangers when called upon.

According to an arrangement between this Company and the heads of the St. Maurice and Laurentian Forest Protective Associations in connection with the fire patrol and care of fire in every respect, you will arrange to co-operate with these people by all possible means, therefore should the fire ranger happen to call upon you for assistance, him do everything possible to give them what assistance you can and as QUICK AS YOU CAN, because by acting promptly, fires are often controlled before any material damage is done.

It has also been arranged with Fire Rangers in certain Districts to assist the Section Foremen in burning grass, old ties, etc., this with a view of showing sectionmen the proper methods of doing this work, and as you are aware many times when foremen undertake to burn the right of way, they do not always take all the necessary precautions to look after the fire and in many cases this involves a lot of extra work, due to carelessness in burning the right of way.

The object in co-operating with the men employed by the Associations named above, is to learn the best methods and obtain the best results, as well as eliminating a lot of trouble. Therefore, I trust you will give all necessary assistance when called upon and be governed by their instructions with regard to fires in the future. As these people are desirous of assisting us in our work we should also be anxious to assist them in carrying out their part."

COMMUNITY STUDIES

One of the economic studies made last year concerned the relation of forest utilization to community development in the Pacific North-west and northern Lake States. The lumber "camp" is the natural result of a nomadic lumber industry. As the forests of any region become permanent sources of timber supply they become capable of supporting a more stable population. Where the forest is the main resource the development of permanent industrial communities as sources of labor supply is obviously desirable. In regions where the land, though originally timbered, will be put to its best use through clearing for agriculture, it is desirable that forest utilization should contribute as largely as it may to the upbuilding of organized agricultural communities. To learn both the present actual conditions and the possibility of bringing about improved conditions the study was undertaken.—*From the report of H. S. Graves, Chief Forester of United States.*

CONQUEROR'S OAK FALLS

A correspondent of London, Eng., says Canadian Foresters have felled the famous tree which stood in front of Windsor Castle, known as William the Conqueror's oak. The tree was reputed to be a favorite of the Norman Duke, who protected it from deer. Old manuscripts show the oak tree existed in the year 900. Latterly the tree became unsightly and was very rotten. After ineffectual attempts to have it reinforced with cement, the King ordered its removal.

The timber is very fine grain and color. One slab is used for a mantle-piece in the small replica of a Canadian log cabin built by the Canadians in Windsor Park as a tearoom for the King. A number of souvenirs have been made of the wood. One is a carved plaque of Windsor Castle background and Indian's head.

Boy Scouts Search Out Black Walnut

Washington.—President Wilson's appeal to the Boy Scouts of America to help win the war by locating supplies of black walnut trees has been followed by arrangements under which the War Department, the Forest Service, and the Boy Scout organization have joined efforts to find the needed timber.

As President Wilson pointed out, the War Department program makes the securing of black walnut lumber for use in manufacturing airplane

propellers and gunstocks of the utmost importance. War Department and Forest Service officials are combing the country for black walnut timber, which can no longer be found in abundance anywhere but has to be culled, often as single trees, from mixed forest growths. Much of the black walnut that is left is in farmers' woodlots, and it is primarily to locate this that the Boy Scouts have been called into service. In the aggregate, there are said to be large supplies.

Settlement Problems After the War

The relation between the forests and settlement is a question involving many interests, and is one not easy of solution. The need for land for settlement after the war will make it necessary to devote every possible piece of land to agricultural purposes, but on the other hand the financial demands for the war will make it advisable and necessary to protect the public forest property, and

ensure that the forest on non-agricultural land is retained and brought into best producing condition. This is a question which cannot be decided from the point of view of either interest solely, and which shows the necessity of co-operation between the agricultural and forestry interests for the development of an agricultural and forest survey of the country such as will determine the best general lines of development for each district.



A Government Roadway in Northern Ontario in Process of Construction.

WEEDS KILLED BY PAPER

H. E. Howe, who conducts the chemical service department of *The Scientific American*, tells us in that paper that in the tropical countries where sugar-cane flourishes, weeds spring up overnight in numbers and strength that will choke off any crop with ease. The expense of keeping them down is by no means the smallest item of the cost of production, and their presence or absence often makes the difference between a profitable and an unprofitable year. Mr. C. F. Eckart, of a Hawaiian sugar company, therefore began experiments looking to weed-control. Says Mr. Howe:

"Weeds between the cane rows could be controlled by spraying, after which followed a demonstration that the weeds could be smothered by strips of paper, asphalt impregnated to withstand weather and handling.

"Knowing that cane shoots are tightly rolled up, sharp-pointed and spear-like, Mr. Eckart conceived the idea of using paper over the cane rows, being careful to have the paper of the proper construction to hold the weeds beneath, while the cane, by gentle pressure, could puncture the covering. Considerable acreages have been under experiment and several interesting developments have taken place.

"The paper in yard widths is placed over the rows and kept there by bamboo pegs, stones, and field litter. As the cane shoots come up those striking the paper at or near right angles puncture the covering and grow vigorously. The other shoots make tentlike elevations, at which points the paper is slit after five or six weeks, during which time the cane does not suffer, although the less hardy weeds are exterminated."

CHARLES L. PACK HONORED

Mr. Charles L. Pack, President of the American Forestry Association, and head of the National War Garden Commission of the United States, has just had the degree of Doctor of Laws conferred upon him by Trinity College.

A Great Book on Our Wild Animals at a Bargain Price!



In the idle moments of your summer outing there is opportunity for burnishing up your half-forgotten knowledge of our Canadian wild animals and for learning a hundred things you never suspected before.

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

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

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

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

Enclose a dollar bill to the Canadian Forestry Journal, 206 Booth Building, Ottawa, marking your name very plainly on the attached coupon:

.....
Canadian Forestry Journal, Ottawa.

✓ Please send copy of 'The Animal Guide' in leather binding to the following address. One dollar is enclosed.

Name.....

Address.....

The Motor Truck in Logging

The improvement of means of transport in Canadian forest operations is closely allied to several outstanding problems in forest conservation. For example, the utilization of hardwoods in Ontario, Quebec and New Brunswick logging operations is yet unsolved. The resultant loss of forest materials each year is enormous, but the most serious feature is in the transportation of our forest areas into predominantly hardwood types. As forest industries for the greater part are maintained on coniferous woods it becomes a prime interest of forestry that the scope of profitable logging should be extended to include hardwoods and thus maintain a proper balance. Driving hardwoods by water for long distances is practically prohibitory owing to sinkage. Until cheap transport can be worked out, the double advantage of developing hardwood-using industries on a large scale and correcting degenerative tendencies in the Eastern Canada forests cannot be attained.

The following article by Richard Hilliard of Seattle, on "The Motor Truck in Modern Logging," will be found interesting, although its application is for Western rather than Eastern conditions.

Transportation has always been the big problem in logging, second only to labor in its importance. Any method which will enable the logger to get his timber quickly, and get the logs out to market dependably, economically and rapidly is a big stride in the right direction.

Today it is generally a question of yarding out, using a railroad or employing motor trucks. Of course there are certain types of show where special methods must be employed. You are familiar with many of them, where tram roads, cogwheel tramways and other ingenious methods are quite satisfactorily employed to overcome unfavorable natural conditions. But getting down to the

large majority of cases, where the terrain is fairly representative of shows in our Northwest country, from the spar tree to the pond, boom or railroad is the distance we must cover. Now, the motor truck is not a competitor of the railroad, nor of river driving. It is an ally. There are shows where it is obviously best to yard into the water; others where a railroad should be used; and yet others, and a very large number of them, where the motor truck and trailer is the only good solution of the problem.

The truck offers these advantages — the road can be put into the timber quickly and economically; it costs much less to build a logging truck road than a railroad; the equipment costs less and is more quickly assembled; the outfit is very mobile and can be changed from location to location quickly, the trucks pulling up and carrying the poles or planking used for the road and carrying the donkeys from location to location. The motor truck outfit is very flexible.

Where railroads are already in and it is desired to reach patches of timber a mile or more from the road, trucks can be used to get this timber out to the railroad cheaply and quickly—and speed is essential in these days of high prices for logs. Where railroads are not in, it is a question of going over the show and figuring out the best method.

The motor truck has long since passed the experimental stage in logging work; it is no more an experiment today than the donkey or the high lead or the locomotive. There have been failures with trucks, it is true, but in every case these have been due to improper equipment, poor roads or absolute ignorance of log handling. There are motor trucks working all through the Puget Sound country, and in other parts of the Northwest, giving excellent satisfaction and handling the logs cheaper than any other method.

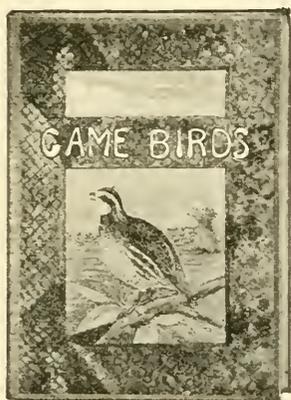
KNOW THE GAME BIRDS

Great Fun as well as Great Instruction if you possess a copy of "Game Birds."

Are you able, off-hand, to describe twenty-one kinds of ducks and six kinds of geese? Probably not!

Here is an opportunity that will not come your way again. The Forestry Journal has four hundred copies of "Game Birds," which it is able to dispose of at

FIFTY CENTS A COPY
THREE COPIES FOR \$1.00, POSTPAID



A splendid little book of 64 pages, 5 x 7 inches, made up of heavy coated paper throughout.

Forty-nine of the best illustrations in life-like natural colors you ever saw—really a beautiful piece of quadri-color printing. Decorated board covers.

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

CANADIAN FORESTRY JOURNAL
206-207 Booth Building, Ottawa.

THE UNIVERSITY OF TORONTO

AND

UNIVERSITY COLLEGE

WITH WHICH ARE FEDERATED

VICTORIA, TRINITY, ST. MICHAEL'S
KNOX and WYCLIFFE
COLLEGES

FACULTIES OF

ARTS

APPLIED SCIENCE

MEDICINE

EDUCATION

HOUSEHOLD SCIENCE

FORESTRY

For further information, apply to the Registrar of the University,
or to the Secretaries of the respective Faculties.

Here's the big point that must not be forgotten—motor trucks are just as dependable a method of transporting logs as the railroad is; it is generally a question of which will best fit the individual requirements of the project under consideration. It doesn't make any difference whether it is a big show or a small one, the conditions govern the decision.

In some places the very long haul, or a rehauling problem or some other local condition, makes the railroad the right method; in others the speed with which the timber can be reached with a road, the fact that spar trees can be located where advisable and the road run to them easily, the lowered cost of road and equipment, and the flexibility and mobility of the truck units make the motor truck the best solution.

Unless you know which method will answer best—get an expert who thoroughly understands motor truck

logging. Then select the proper truck and trailer equipment. Then build good roads for the truck and trailer to work on, for the biggest mistake a man can make is to assume that because a touring car will run over a certain piece of dirt road that a truck weighing six tons and loads ranging from 12 to 20 tons can be hauled over it continually without trouble. A good road is just as essential to the motor truck as it is to the locomotive—and you know how important that is though the road for the truck will cost a great deal less than the road for the locomotive.

Curves, grades, etc., are not so important, with the truck as they are with the railroad, of course, and where planks or poles are used for trackage, ballasting is not necessary.

If you can use horses, you can use trucks, and do more work, do it quicker and easier and at far less



Two pumping outfits carried on two pack horses

YOU CAN PACK IT WHEREVER HORSE OR MAN CAN GO.

Governments and Private Owners of Forests have materially reduced
their fire loss by the use of

FAIRBANKS - MORSE PORTABLE FOREST FIRE ENGINES

These compact powerful little pumping outfits have repeatedly
substantiated our claims wherever they are used.

Full information on request.

The Canadian Fairbanks-Morse Co., Limited

"Canada's Departmental House for Mechanical Goods"

St. John, Quebec, Montreal, Ottawa, Toronto, Hamilton, Windsor, Winnipeg,
Saskatoon, Calgary, Vancouver, Victoria.



Easily lifted into a light Automobile



An outfit on a Fairbanks-Morse
Railway Motor Car

expense. How many teams a truck will replace depends on the hauling conditions, length of haul and many other factors; but take this one instance of a motor truck and trailer, hauling on a two-mile plank road, handling 30,000 to 40,000 feet a day

at a cost of approximately \$18, including driver's wages, depreciation, interest on investment, taxes, gasoline, tires, oil, etc. What would it cost with horses?

The motor truck is unquestionably the new and big factor in logging.

With a Forester in Armenia

"The people out here grow Lombardy poplar as a timber tree. Little groves of it or now and then fair-sized patches is the nearest they come to forests. Most of it is grown in long rows along irrigation ditches. They trim it off along the trunk so that it develops into a very tall, thin tree. They use these poles as rafters, etc., in their mud houses. The really great need here is fuel wood. The people use manure cakes in their fires almost entirely, as only the wealthy can afford wood to burn. Twenty dollars (about) was the price I heard quoted for one cord. Except along the few river beds where willows, wild olive, and as far as I have seen, nothing else grow, this is a treeless country. In fact, the location of the villages is noticed by the presence of trees, which are on irrigated soil. My belief is that this is due to lack of enough water or to poor distribution of rainfall.

"Now, to get down to what can be tried out here. I have some Western yellow pine seed, and some Douglas fir. But it strikes me that some of the real desert trees of America, such as the mesquite, the Palo Verde, and especially the eucalyptus, might do well here. Also I am anxious to try out some of the dry site conifers such as the jack pine, all four of the nut pines, and any other extreme drought resisting species. It also seems to me that the ailanthus should do well on some sites here and make a welcome shade tree. Then the thought comes to me that there may be a number of Australian species which might fit and perhaps the Aleppo Pine, *Pinus halpensis* Mill, might be worth trying out. And are there not some very hardy species that grow on the dry

veldt in Africa and on the plains of the Argentine? As to the irrigated tracts it seems to me that there are better species than the Lombardy poplar. How about the American cottonwood? Could you send me a few cuttings or some seed to experiment with?

"I am writing this, and in fact we are all acting in our work, as if it was a sure thing that nothing in the way of another invasion of this district by the Turks and Kurds was going to take place. In reality we are always living on a powder mine here. There are some fifteen thousand refugees in Urumia and all around us thousands more. Three thousand fresh ones came in a little south of here about two weeks ago. Many of them were really almost naked and the poverty, famine, want and horror of it all make your heart ache. I am glad I came out to do what I could. This winter is going to be the worst that ever struck this region. Just at present it is summer and so warm that the poor people do not need clothes much. Also they manage to scrape up enough to keep alive, but when the cold starts in there will be the most terrible want that you can think of. I assure you that when you have a small mob of 50 Gilu, Kurdish and Syrian men, women and little children pressing around you, filthy, dirty, covered with sores, haggard and gaunt and all of them crying out for anything at all to eat, it makes you feel pretty hard toward the plenty of the United States and the way they are not making use of it. Why, one night's expenditures on wine, women and song along Broadway would save

the lives of whole nations out here. I thought that I had seen some of the poorest people alive when I saw some of the poor people of the New York

slums and the poor whites of the South, but they are bloated bondholders compared to these refugees.
From "American Forestry."

The Problem in Abitibi

Mr. G. C. Piche, Chief of the Quebec Forest Service, who recently took control of the fire protection work in that province stated recently to an interviewer of the Quebec Telegraph some interesting facts concerning the new fire protective system in the Abitibi region:

"I have recently been to the Abitibi district on the line of the Transcontinental Railway, where I went to organize a fire protection service. It is a section comprising a large area of forest property of much value, and at the same time a rich agricultural centre. The land is extremely suited for agriculture and settlers are going there in large numbers. The constant rain of last season greatly delayed the settlers from clearance work. So this year they will have to do double the work, and it is expected that they will clear about 20,000 acres, scattered between the Nottaway and La Reine, about one hundred miles in length.

"The settlers at Abitibi, are distributed on each side of the Transcontinental Railway, some as far as ten miles apart. The Department requires that each settler should obtain a permit before burning his slash, as a precaution against forest fires, and the Department will employ ten special rangers during the dangerous season. Besides these precautions the Transcontinental Railway right of way requires a good deal of attention on account of the growth of scrub and grasses, part of the debris that have been accumulated and not burned or removed. These conditions make it necessary to acquire and maintain sprinklers that will follow the trains as they pass this section to extinguish any fires that may be started by the sparks from each train.

"In addition to these sprinklers

special pumps with adequate equipment will be installed along the line of railway, and distributed at various given points at combat fire. It will mean a big expense, but the Government desires to protect the settlers' lives, as well as their property, and prevent a repetition of the terrible calamity at Cochrane two years ago, when two hundred miles of timber limits were burned, and 220 lives lost in the flames, that swept out of existence villages, and caused such dire results generally.

"The Transcontinental Railway authorities have promised the Quebec Government to assist in this matter of expense and protection, because they are also interested, especially in the welfare of the country, or section of the railroad which has and is giving the railway a heavy and lucrative business, in both the passenger and freight branches of the service, and as the railway officials admit, much more than they ever expected.

"The forest fire protection service as merged with great success by the several protective associations organized by the lumbermen of the Province is such that the gross results in a general way, is far ahead of all other Provinces in the Dominion. The people of this Province have come to realize more than elsewhere, what forest fires mean as a medium of destruction to themselves as well as the Province, and the Government on this account obtains more co-operation from the people than any other Province in the Dominion. But this does not prevent forest fires continuing, until a proper system of education in regard to the settlers is practically placed before them, that will cause even more precautions against forest fires.



The Motor Cycle and Side Car have been found to do good work in the St. Maurice Forest Protective Association Territory.

FORESTRY IS FORESIGHT

There is urgent need for a definite stock-taking of the commercial timber and pulpwood now available. Mathematical accuracy is not essential, but sufficient cruising and gathering of data should be completed to permit of reliable estimates being made, much work has already been done by the Commission of Conservation in British Columbia. Similar work will be done in Ontario, as soon as the funds are available and the necessary organization has been completed. Then, too, the provincial government of New Brunswick is engaged in making such a survey. As yet, however, only a partial methodical stock-taking has been made of the available pulpwood supplies of Quebec. Quebec has, however, the most important pulpwood area in Canada. The transportation facilities of the province, both natural and artificial, are excellent for the delivery of pulpwood and pulpwood products on the important markets in America and England.

Much additional information as to the amount, distribution and accessibility of these pulpwood areas should be ascertained. Then, measurements of each tree in typical areas

set apart for that purpose, should be made from time to time to ascertain the natural annual increase in diameter under normal conditions in the forest. This information would make possible a close estimate of the probable duration of the supply.

But unless there is a replacement of the trees removed, it is obvious that the supply can only last for one generation of trees. In a study of a limited area in the St. Maurice valley, Dr. Howe found that balsam and hardwoods predominate in the new growths, and that spruce and pine are being steadily and surely depleted. By practising scientific forestry and by discovering means for utilizing the hardwood forests profitably, much may be done to correct this defect. However, to improve upon nature, it is necessary to know how nature acts and reacts upon the thing we wish to improve. Thus far, no determined and sustained efforts have been made in Canada to get such data in regard to forests. It will be essential to discard the trust-to-luck-and-to-nature policy and substitute therefore a policy based on knowledge obtained by scientific studies of conditions.

TREES, SHRUBS AND SEEDS

Hardy Northern Trees and Shrubs at Lowest Prices. Native and Foreign Tree Seeds

EDYE-DE-HURST & SON, DENNYHURST

DRYDEN, ONT. Shippers to H. M. Government, Etc. Correspondence Francaise.

Hill's Seedlings and Transplants

ALSO Tree Seeds for Reforesting. Best for over half a century. Immense stock of leading hardy sorts at low prices. Write for price list and mention this magazine.

Forest Planters Guide Free.

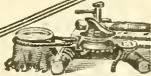
The D. Hill Nursery Co., Evergreen Specialists
Largest Growers in America.

Box 503 Dundee, Ill., U.S.A.

Try This Stump Puller at Our Risk

The Smith Stump Puller will take out every tree and stump by the roots, clearing from one to three acres a day, doing the work of twenty men. We want you to send for our 3 year guarantee against breakage and our free trial proposition. Address

W. Smith Grubber Co.
11 Smith St.
LeCrescent, Minn.



YALE UNIVERSITY FOREST SCHOOL

NEW HAVEN, CONNECTICUT, U.S.A.

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

For further information address

JAMES W. TOUMEY, Director
New Haven - Connecticut

Gagnon & Morissette

Lumber Contractors
Timberland Cruisers
Forest Industries

CHICOUTIMI, P.Q.

LT.-COL. L. J. D. MARQUIS

Forest Engineer and Mem. Can. Soc. of F.E.;
Quebec Assc. of F.E.; Former Mem. Que. F. Service

Forest Cruising and Mapping
Timber Factors and Logging Costs
Facts on Forest Growth and Future
Products

90 LOCKWELL AVENUE, - - QUEBEC

R. R. BRADLEY

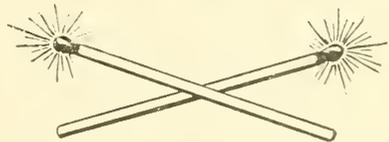
Forest Engineer and Mem. Can. Soc. of F. E.
Consulting Forester to the New Brunswick Railway Co.

Timber and Pulpwood Estimates. Forest Maps. Advice on the Management of Wood Lands. Timber lands listed for sale.

GLOBE ATLANTIC BUILDING, ST. JOHN, N.B.

Or P. O. Box No. 5, QTTAWA, Ont.

ASK FOR



PHILLIP T. COOLIDGE FORESTER

Timber Estimating and Mapping.
Supervision of Lumber Contracts.
Surveying. - - Forest Planting.

STETSON BLDG., 31 CENTRAL ST.
BANGOR, MAINE.



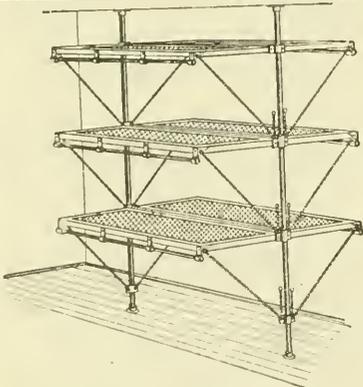
Courtesy "Canadian Lumberman"

CANADIAN FORESTRY CORPS FOOTBALL TEAM AT CATFORD, ENGLAND

The Canadian Y.M.C.A. with the Overseas Military Forces of Canada is conducting a big work, for the men of the Canadian Forestry Corps in Great Britain and France. Here and there in the romantic old forests of England, up among the Highlands far north in Scotland and in the forests of France, are located camps of Canadian lumbermen in khaki.

Within the confines of the city of London at Catford, is one of these stations of the Canadian Forestry

Corps, which is served by the men of the Red Triangle. At Catford no timber cutting is done, the camp being used for the setting up and assembling of the mills which eventually find their way into the outlying forests, where cutting is in progress. The Y.M.C.A. centre at Catford is styled "The Canadian Forestry Club," and is carrying on a useful work in a social way, for the men stationed there.



STEEL BUNKS FOR CAMPS

Included in the well-known line of DENNISTEEL factory, hospital, camp and ship equipment is the all-steel sanitary bunk illustrated. Take up very little room, are comfortable, hygienic and practically indestructible—a permanent investment. Write for particulars and folders on any of the following lines:

Steel Lockers, Bins, Cabinets, Chairs, Stools, Etc.
Standardized Steel Shelving (knock-down system).
Steel Hospital Equipment. General Builders' Iron-work.
Ornamental Bronze, Iron and Wirework.
Wirework of every description.

**THE DENNIS WIRE AND IRON
WORKS CO. LIMITED**

**LONDON
CANADA**

Halifax Montreal Ottawa Toronto
Winnipeg Vancouver

CONFEDERATION LIFE

ASSOCIATION UNCONDITIONAL ACCUMULATION POLICIES

Are liberal up-to-date contracts which guarantee to the insured every benefit consistent with safety.

Write for Particulars

which will gladly be furnished by any representative of the company or the

HEAD OFFICE, TORONTO



QUEEN'S UNIVERSITY

KINGSTON
ONTARIO

ARTS MEDICINE EDUCATION APPLIED SCIENCE

Mining, Chemical, Civil, Mechanical and
Electrical Engineering.

HOME STUDY

Arts Course by correspondence. Degree with
one year's attendance.

Summer School **Navigation School**
July and August. December to April.

J. E. O. Y. CHOWN,
Registrar.

MINIATURE CONSTRUCTION

Landscape, Mechanical and Architectural Models, Topographical Maps and Paintings. for

SCHOOLS — COLLEGES — MUSEUMS
Government work a specialty

MORGAN BROS. CO., Inc.
MODEL MAKERS

Room 1650 Grand Central Terminal
Phone 7720 Murray Hill

NEW YORK CITY

UNIVERSITY OF NEW BRUNSWICK

FREDERICTON, N.B.

DEPARTMENT OF FORESTRY
Established in 1908

Best of facilities for definite instruction and supervision in Practical Forestry.

Surveying, cruising and construction work carried on in our own tract of 3600 acres, with Forestry Camp in the centre.

Competent men from the School at present in demand to take up Forest Survey work with the Provincial Crown Land Department.

For further information address :

DEPARTMENT OF FORESTRY

University Calendar furnished on application.

C. C. JONES, Chancellor.

R. O. SWEEZEY

(B. Sc., M. Can. Soc. C.E.)

CONSULTING ENGINEER.

Water Powers. Timber Lands.
Financing Forest Industries.

164 St. James St. MONTREAL.



Cut The Cost of

Forest Protection

The best communication system for forest protection work is C & W wireless. Why? Because it is the most reliable and cheapest.

Every C & W Wireless set is built for the hardest kind of service for a period of from ten to twenty years. It operates on a new patented principle with a gap voltage of 200 volts as against 8000 to 20000 volts in the old style apparatus. This means the elimination of heavy, cumbersome and expensive insulation, and a factor of safety of ten as against one and a half in the old style radio sets.

Because of its extreme simplicity of construction, the initial cost of a C & W set is actually less than that of any other radio set of the same size in the world. It is so small and compact that it may be installed on an ordinary 2½ x 4 foot table. Once installed, the up-keep cost is negligible, because C & W sets can't break down.

May we help you solve your problem?
Send us complete information and our
engineers will give you their best service.

Cutting & Washington, Inc.
1083 Little Building - BOSTON, Mass.



Canadian Forestry Journal

Vol. XIII

AUGUST, 1918

No. 8



ACULTY OF FORESTRY

SEP 14 1918

UNIVERSITY OF TORONTO

CUTTING B. C. SPRUCE FOR AEROPLANE MANUFACTURE

TENTS IN EVERY STYLE

May be had made up of
the celebrated



Write for Samples and Prices.

The Woods Manufacturing Co., Ltd.

· FORMERLY SMART-WOODS, LTD.

OTTAWA - TORONTO - MONTREAL - WINNIPEG

FOREST TELEPHONES



Make the life of the forester better worth living. They relieve him from the appalling loneliness. They help him to keep in human voice touch with foresters miles away.

In emergencies—fire—sickness—hunger—the speed with which they can summon help is marvellous.

Write for full particulars of how to install the Northern Electric Forest Telephone System. Address the Office nearest you.

Northern Electric Company
LIMITED

Montreal	Toronto	Regina
Halifax	London	Calgary
Ottawa	Winnipeg	Vancouver

Northern Electric Forest Telephones

Canadian Forestry Journal

CIRCULATION 6800 COPIES MONTHLY

ROBSON BLACK, Editor.

Vol. XIV.

WOODSTOCK ONT., AUGUST, 1918

No. 8

CONTENTS FOR AUGUST

GROW TREES FOR AEROPLANE BUILDING.

By Ellwood Wilson.

B. C. BUYS FLYING BOAT FOR FIRE PATROL.

SCOTLAND READY FOR FORESTRY ADVANCEMENT.

NOVA SCOTIA'S STAKE IN FORESTRY.

A CHALLENGE TO NOVA SCOTIA.

DEMARCATIION PROMOTES SETTLEMENT.

EXHIBITION COACH TO TOUR THE EAST.

ITALY ON THIN EDGE OF FOREST SUPPLY.

DO PRIVATE WOODLANDS PAY?

SCIENTIFIC INVESTIGATION HOLDS THE KEY TO CANADA'S
FUTURE.

CO-OPERATION AND ITS BENEFICENT RESULTS.

THE FOREST POSSESSIONS OF SPAIN

TANK CARS IN FIGHTING FIRES.

ENGLAND'S FORESTS SACRIFICED TO WAR.

CONQUERORS EXPLOIT RUSSIAN FORESTS.

AN EMPIRE PARTNERSHIP IN FORESTRY.

GREAT TIMBER WEALTH OF SOUTH AMERICA.

THE FORESTS OF NEW ZEALAND.

BRITISH GUIANA'S TIMBER RICHES.

THE SECOND CROP OF PULPWOOD.

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

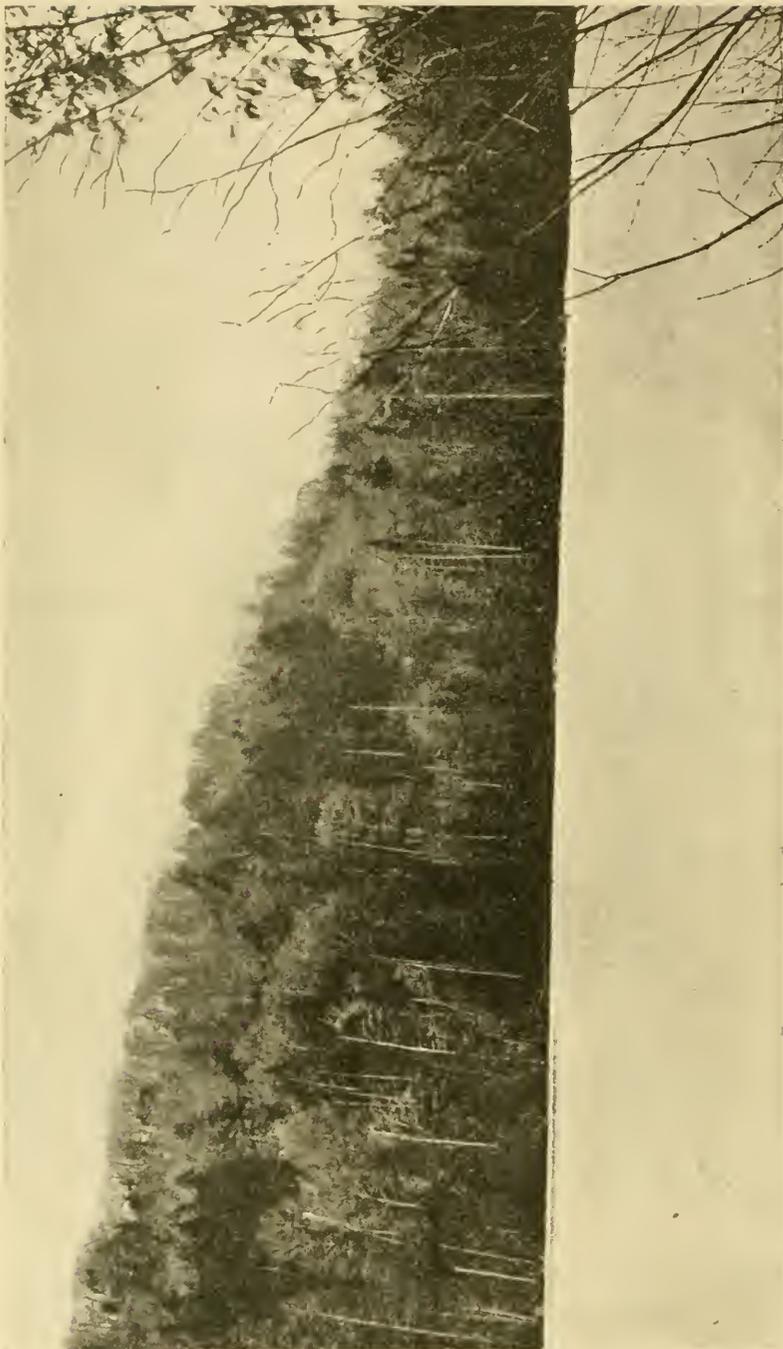
Address all Communications to

THE CANADIAN FORESTRY JOURNAL

206-207 BOOTH BUILDING, OTTAWA

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

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



Courtesy Commission of Conservation.

CAN NOVA SCOTIA AFFORD TO LOSE THIS ?

Mixed Forest, Sugar Maple, Yellow Birch, Beech, Red Spruce with Fir on the Margin of the Lake.
Nearly Three-Fourths of the Forests of Nova Scotia are of this type.

Grow Trees For Aeroplane Building

By Ellwood Wilson, Chief Forester of The Laurentide Co.,
Grand Mere, P. Q., and Member of Staff of
Imperial Munitions Board.

The necessity for getting all the spruce possible for the construction of aeroplanes for all of the Allies has compelled an investigation of all the possible sources of supply.

Before the war most of the factories in the United States demanded spruce from West Virginia or the east, New England, and were not at all desirous of using Western spruce. Germany was buying up all the supplies of eastern spruce possible and it is on record that when a car of western spruce was included in a shipment, the German inspector refused it, on the ground that it was western spruce. When the war broke out, it was realized that large amounts of long, clear spruce could be most readily obtained from the huge trees of the west coast and every effort was and is still being made to exploit this source of supply.

Eastern spruce, best in quality.

The Forest Service of the United States, immediately, on the entry of that country into the war, made a careful study, with most practical and elaborate tests, of all the possible woods which might enter into aeroplane construction. These tests showed conclusively that there is no superiority of one kind of spruce over another, that the value of wood is dependent altogether on its density and straightness of grain. Eastern and western spruce with the same number of rings per inch and the same air-dry weight are of equal value. Speaking broadly, eastern spruce is a little better than western because it is slower of growth and therefore has more rings per inch. Since the western trees are very much larger it is possible to get longer and larger pieces of clear material out of them and these work up easier in the factory and consequently are preferred. At first this entailed a large waste as the factories took these long clear pieces and cut them up for the short parts. This source of waste has been reduced but not yet as much as it should be.

Only one in a thousand pulp logs is useful.

The great difficulty with eastern spruce is that it is very difficult to get long lengths and large pieces which are clear. As it grows naturally in the forest, the shade may not have been sufficiently dense during the early years of the tree to kill the lower branches, causing them to be shed. Consequently as the tree continues to grow the branches are gradually incased with new wood and cause knots. As the tree increases in size, these old short branches become entirely inclosed and a layer of perfectly clear wood is laid on. In Quebec spruce, for instance, this clear layer, rarely exceeds two inches in thickness for any length worth while. A careful estimate shows that about one log in one thousand of the run as cut for the pulp mills will contain sufficient aeroplane material to make it worth cutting up, that is, under present factory specifications. Of the spruce sawed up by mills manufacturing lumber from 1½ to 2% of the total cut may make aeroplane stock.

Factories demand easiest worked woods.

The great difficulty at present is this:—The Allies need every cubic inch of spruce stock which they can obtain. The Aeronautical Board in the United States is short of spruce as is also the French Government. The British

Government is said to have sufficient material for the immediate future. The factories, naturally wishing to operate at a profit, and with as little trouble as possible, are demanding material which is the easiest to handle, i.e., long and large clear lengths. They are disinclined and in fact refuse to accept, short lengths which could be laminated in various ways and would be stronger and lighter than solid beams. They will not accept material which contains small knots or other minor defects, although some of the buying specifications allow them, and although careful tests show that such material could be used with perfect safety. To sum up the situation briefly, the factories, and therefore the purchasing agents, act as though all they had to do was to demand the kind of spruce that is easiest to use regardless of the available supply, the amount wasted in cutting up, or the way in which the trees grow. There is not proper co-ordination between the producing and the consuming ends of the business.

Grow Trees Especially for Aeroplanes.

Everyone who stops to think, knows that the spruce, whether eastern or western, did not grow in ten years nor in one hundred. The supply available is known very closely. We shall want aeroplanes just as much or more after the war is over, and it is only common sense and good business to use our supplies with the greatest care possible to avoid waste and still turn out perfect machines.

By proper spacing in planting and care to preserve the proper density of stand, we shall be able to plant spruce especially for aeroplane stock and ensure a supply for the future, but there should be no delay in commencing.

The United States Navy are utilizing eastern spruce and are not only obtaining enough for their own requirements but are supplying the British War Mission. They are well organized and are handling the thing in a business-like way and "man-fashion" and an arrangement has been entered into by which they will extend their operations in Canada and get what they can in the east, supplying what is needed to the Imperial Government. This has been arrived at by the closest co-operation between the Imperial Munitions Board, The British War Mission and the United States Navy, and will do away with competition and useless duplication of effort and overhead charges

*“Forest Conservation in Canada,”
says the Forestry sub-committee of
the British Reconstruction Commit-
tee, “is an Imperial Question of the
first magnitude which deserves im-
mediate attention.”*

B. C. Buys Flying Boat for Fire Patrol

First Official Experiment in Use of Planes for Forest Protection

In line with the decision announced some time ago to improve the system of forest protection, the British Columbia Government has contracted with the Hoffer Motor Boat Company, of Vancouver, for the construction of a patrol flying boat to be utilized for forest patrol.

Some two years ago this up-to-date method of forest protection was the subject of discussion at a gathering of Northwest lumbermen at Portland, and the idea of an air force of fire wardens was strongly advocated as both practical, economical and efficient. The great stretch of country that an airship could keep guard over, and the ability to distinguish the first beginnings of fire, and rapidly get help to the spot to prevent its spread, were factors that appeared

to be especially within the province of an air patrol. The idea has been seized upon by British Columbia, and will within a month or two be put into operation.

At first it was thought possible to arrange with the Imperial Government for the leasing a machine from the naval force, one of the obsolete hydroplanes. But this idea has been abandoned in favor of the purchase of a flying boat type, which will be better adapted to the purpose. The machine contemplated will carry the pilot and one fire warden, it will have a wing spread of forty-two feet, and chord of five feet will develop 100 horse-power, and have a speed of seventy-eight miles per hour, and a climbing capacity of about 3,000 feet in ten minutes.

Scotland Ready for Forestry Advancement

That Scotland has been aroused by the experience of war time to the pressing necessity of national forestry policies is indicated by the following letter:

West of Scotland Agriculture College,
Department of Forestry, Glasgow, Scotland.

To the Secretary, Canadian Forestry Association,
Ottawa, Can.

Dear Sir:

I should like to indicate to you that for some time past in the West of Scotland here we have been very much interested in the development of the Canadian Forestry Association. As you are aware we have no analogous Association in Scotland, but there is a feeling at present that such an Association should be formed, and I had thought that you might be able to assist us with suggestions and advice regarding the formation of such.

I may say that a very keen interest in the development of Forestry is being shown by business people in the West of Scotland here, and we should value very much any advice sent us.

Yours faithfully,

(signed) G. P. Gordon.



Courtesy Commission of Conservation.

A Pure Stand of White Pine in Nova Scotia, supposed to have Started after a Fire in 1830.
Second Growth White Pine is of the Most Common Occurrence in
Queens and Shelburne Counties, N.S.

Nova Scotia's Stake in Forestry

By Dr. B. E. Fernow, in

"Forest Conditions in Nova Scotia."

"Fully two thirds of the area of the Province consists of non-agricultural land covered with forest growth or not fit for any other use than timber growing. This forest resource which furnishes not less than four to five million dollars in value of product annually is in danger of exhaustion within the next two decades."

"The actual green forest area consisting of some five million acres and stated as occupying 52.5 per cent. of the area of the Province must, on the other hand be increased by the potential 5 per cent. of recently burned area and by nearly 12 per cent. of the better class barrens which can eventually be reforested so that the actual or potential forest area may be set down as representing 70 per cent. of the total land area. The balance, some 10 per cent. is hopelessly barren. This is a rather small percentage for waste land and only conservative treatment of the woodland area, protection against fire, and recuperative measures in the old burns and hopeful barrens will keep it there."

"Less than 100,000 acres of virgin or semi-virgin timber remain and altogether not over 1,400,000 acres, one quarter of the green forest area, are furnishing the log supply of the present mills.

Of the green forest area, pure hardwood forest is represented by less than 7 per cent. and pure coniferous growth by 20 per cent. the bulk of the forest, namely 73 per cent. being of mixed type.

A Challenge to Nova Scotia

By the Editor of the Halifax "Echo"

Conservation of natural resources has been much talked of during the last decade, but it cannot be said that here in Nova Scotia there has been enough public interest in the matter to give us any material advantage. However, it is hardly to be expected that a country that wastes its infant life through carelessness and indifference would be particularly interested in protecting its forests and other resources. Yet the loss is almost immeasurable.

Unquestionably, it is impossible that a small province like Nova Scotia with a limited income, could provide forest rangers enough to assure the protection and preservation of the forest, but it does come within the limits of possibilities to create a widespread public sentiment

that will go far to doing the same work that a host of rangers might do. It matters not in which direction one turns, the lesson is again and again borne in upon us that the greatest drawback to development in this province is an active, enlightened, widespread public spirit.

Every avoidable forest fire is not merely a severe loss to the country at present and for the future, but it is in itself an accusation against our people's lack of public consciousness. We are too apt to think in terms of our individual interests. Community interests apparently have little weight with us, and that can only come from failure to think in community terms. Public schools, churches, institutes, and all other clubs and organizations should band



IN NOVA SCOTIA'S NO-MAN'S-LAND

A Characteristic Barren of the Sandy or Gravelly Soils. Burned in 1878—
No Reproduction of Commercial Trees.

together for a complete campaign of public education. Perhaps no organization has such heavy responsibilities laid upon it as the church, because while many communities may be without any other organization it is difficult to find one that has absolutely no Church life. There

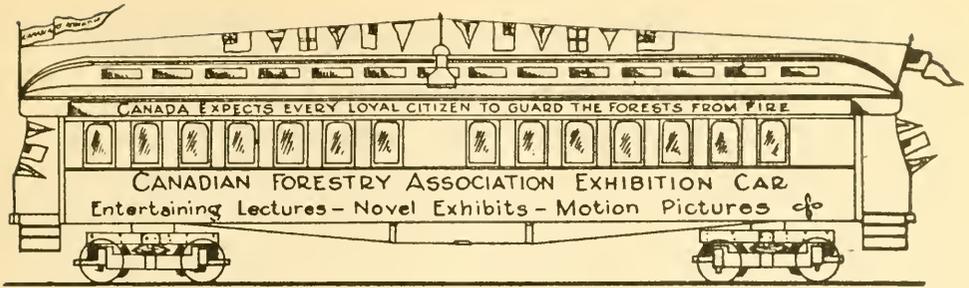
should also be concerted effort on the part of the authorities, provincial and local, to create in the minds of every Nova Scotian, without regard to age or sex, that proper attitude toward public affairs, without which the Province can never hope to attain its full development.

Demarcation Promotes Settlement

It has been often thought that there is antagonism between settlement and forest demarcation. There is really no more antagonism between them than between two banking accounts in the same bank. If the bank is so badly conducted as not to keep these two accounts clear, the depositors cannot be blamed for taking each what he best can in the general confusion! But that is a poor bank in which to place one's confidence. Such a bank represents the country with no forest demarcation. All through Australia I have seen failure amongst forest settlers, dumped down without discrimina-

tion on ground which should have formed part of the national forest estates of the country, while what Australia is going to lose in the confusion we can get a glimpse of in the estimate of 588,000,000 pounds sterling as the loss through bad Forestry during the next 30 years. (D. E. Hutchins, late Conservator of Forests, South Africa.)

The Kaiser's right-hand man is
abroad in Canada. His name is
"The Unextinguished Camp Fire"
Watch for Him! Don't be his partner!



EXHIBITION RAILWAY COACH TO TOUR THE EAST

Canadian Forestry Association arranges a unique advertisement for forest Protection

By grace of the Canadian Pacific Railway Company and the Railway War Board, the Canadian Forestry Association has been placed in temporary possession of an Exhibition Railway Car to travel in Ontario, Quebec, New Brunswick, and Nova Scotia as an advertisement for forest protection.

The car will be outfitted by the Forestry Association with motion picture equipment and a travelling lecturer so that public meetings can be held at scores of smaller communities either in the lecture room of the car or at a local hall. Arrangements have been made to install wireless outfit, forest telephone and fire fighting pumps, all in actual operation, with miniature airplane, lookout tower, as well as a diminutive forest nursery. Large quantities of instructive literature will be carried for free distribution. Banners containing such warnings as "Canada expects every loyal citizen to guard against forest fires" will adorn the exterior of the car from end to end and with flags and bunting will make a striking presentation.

Lectures will be given several times a day, according to the running schedule.

The coming of the Exhibition Car will be well advertised in advance. Several months will be occupied by the journey.

Italy on Thin Edge of Forest Supply

The yearly cut from Italian forests, without considering fuel wood, before the war amounted to not more than 600 million feet a year.

"Up to date the lack of imported lumber and the demands of the war have made such inroads upon the supply that for about 15 years no more timber can be cut. If the war ends within a year or two, Italy must import at least two billion board feet per year, but if lumber prices abroad are approximately the same in gold as they were before the war, it will impart from three to four billion board feet for about three years and two billion board feet for the 12 years following. Many Italian lumber concerns had their own tracts of timber

and mills in that part of Austria bordering upon the Italian Veneto. These concerns will not go back into Austria if lumber can be imported from elsewhere and lumber prices are within reason.

"Outside of southern pine from the United States, virtually all the wood imported was of the kind known in Italy as "abete" (European pine or fir. In my opinion, there will be a postwar market for American spruce, hemlock, southern pine, swamp cypress, redwood and Douglas fir or Oregon pine, as well as for a fair quantity of American white oak, the last named in the form of railway ties particularly.

(U. S. Consular report.)

Do Private Woodlands "Pay"?

BY JOHN C. ARCHIBALD

Royal English Arboricultural Society

The practice of forestry has up to now been carried on in a very half-hearted manner, because the impression prevailed that it did not pay, and was at best an expensive fad. We all pay more or less for our fads, but we have no right to blame woodlands for not paying when they have been deliberately spoiled so as to attain some other object. Again, in times of stress upon an estate it is generally the woods that pay, and the exactment of this payment is not always done scientifically. No one has the right to view such mismanagement and say, "I'm sure my woods don't pay"; the blame lies with themselves. One result of the non-paying impression has been that there has been no definite trial on any scale to make forestry pay, and it is certainly more by the fortunes of war than by anything else that our timber, both old and young, is paying so well to-day.

Forestry in our country and in our varied climate is distinctly a profession in which hope plays a large part, but we nearly always find that with right treatment and judgment this hope is very often justified. We are now receiving a chance for improvement that may never be possible again if we allow it to pass by. On the other hand, if it be taken we can snap our fingers at foreign competition. We would have the timber, and not only that, but a very superior and more durable class of timber than any that could be supplied from abroad. We will have many difficulties to surmount, and we may make some serious mistakes but we gain the best experience from such tuition. Let us then go forward to our planting and regeneration in a large, a very large spirit of zeal, hope and trust, and without fail we shall not be disappointed in results.

LUMBERMEN AND PUBLIC WEAL

Commenting aptly upon the recent formation of the "New Brunswick Lumberman's Association" the Fredericton Gleaner says:

"It is unnecessary to dilate upon the importance of the lumber industry in this province; everybody fully realizes that next to agriculture, it is the greatest industry we have, both in the amount of capital involved, the returns it brings in, and the wages paid to those engaged in it. Under such circumstances, while the improvement of the conditions surrounding the industry is actually of most immediate consequence to those actively engaged in it, at the same time its ramifications extend in many directions, and the welfare of so many people depends to a greater or less extent upon its prosperity, that it becomes more or less a matter of public interest to see that the best is made of it.

There never was a time when the conservation of our forest resources was of greater moment than is the case at present, and their waste in every form should be reduced to the lowest possible scale, and if it is not practicable to quit, cut it out altogether. Because our forest wealth has been given to us freely by Nature without any effort on our own part, we have been prone to treat it as an asset which we might be as careless of as we pleased. Because we don't have to plant before we can reap, in the case of our timber crop, we have never troubled to look very far ahead in the matter of future years' supplies. When one particular district has been stripped of its trees, we have simply moved on further afield, and gathered in our year's cut elsewhere, without stopping to realize that such a plan of operations could not go on for ever.

Scientific Investigation Holds The Key to Canada's Future

To Stop Exportation of Raw Materials Demands Greater Faith in the Laboratory and Less in the Bank Loan

In current discussions of after-the-war industrial development in Canada a new and hopeful note is sounding:—that no permanent progress can be looked for until technical education and scientific research are more liberally provided for in our educational systems, and government policies. The newly-formed Canadian Industrial Reconstruction Association emphasizes these needs in Canadian life very plainly. The Canadian Manufacturers' Association also seems clearly apprised of the demand for a closer alliance with scientific effort. In a recent publication of the Canadian Railway War Board, the striking discrepancies between the value of many Canadian products at the time of export and their value in the form in which they reach the consumer is vigorously underlined, although the War Board declines to launch into a discussion of causes and confines itself to arousing national pride of manufacturers. The bulletin discusses the handicaps under which Canada must pursue her way until to the raw materials, so abundantly allowed to us by Nature, is added a greater degree of labor, skill and art. The point is illustrated by the following:

Raw eggs and icing.

"Raw material is the white of an egg. A housekeeper adds *labor* and makes it white froth—adds *labor* with *skill* and it becomes a stiff white froth."

"Employs, with her *labor* and *skill*, *art*—in putting into the dish first, the right amount of sugar and flavor—and creates a stiff, white highly-palatable material for icing a cake."

"There is nothing new in this.

"Her raw material is worth one cent.

"Plus labor—two cents.

"Plus labor and skill—five cents.

"Plus *labor*, *skill* and *art*—twenty cents.

"So with all industry."

"Yet Canada sells rough stone for grind-stones at \$5.00 a ton and buys foreign-made grindstones at \$100.00 a ton.

"Sells 'fine copper in ore, matte or regulus' for 11.9 cents a pound and buys it back in ingots at 19.2 cents a pound; in strips, sheets or plates (unpolished at 22.8 cents a pound; in straight tubing at 28.6 cents a pound; in trolling spoons at \$2.00 a pound; in cornets for the band at, say, five!

"Sells wheat at 1.8 cents a pound, when she could get 2.5 cents a pound for it as wheat flour. And buys it back in the form of unsweetened biscuits at 7.2 cents a pound!

"Sells a carload of pulp-wood for a six-gross carton of American tooth-paste!

"A train-load of nickel matte from Sudbury for two cars of medium priced automobiles!"

The Railway War Board economist, however, might have continued his interesting lesson to inform Canadian capitalists that advanced industrial processes are not set up by the mere construction of mill walls and the hiring of a staff. The success of scores of famous corporations all the world over may be traced back to the laboratories which in their own unadvertised corner apply scientific calculation to a thousand problems of industrial management. Canada has yet no reason to plume herself upon the amount of official

encouragement or public appropriations directed towards research work. The best that parliament could do at its last session was to try to make a jest of the Dominion Honorary Council for Industrial and Scientific Research, and to slice down its appropriation to a quite insufficient minimum. So we find in many fields that while the outside world has left many branches of our national activities far behind, banquet orators, purporting to represent important industries, insist on glorifying the "practical" man and deriding the expert who attempts to get behind phenomena.

The Brown Corporation.

Excellent examples of the profitable consequences of industrial research have come to hand in a list of industries which have sprung from the original sawmill founded by the father of the present owners of the Brown Corporation of Berlin Mills, N. H., and La Tuque, Que. The sons of the original owner began business and might have continued to old age with the initial equipment. They preferred, however, to take advantage of modern processes and market demands, and soon built up a group of mills for ground-wood pulp, sulphite pulp and kraft pulp. Here again, one might have expected the "practical" paper maker to limit his operations. Through the employment of a group of chemists, *one of whom is said to receive a larger salary than is paid to the entire staff of the Dominion Forest Products Laboratories at Montreal*, the waste materials of the mills were so utilized as eventually to establish a series of important industries maintained upon the otherwise wasted by-products. The following list shows in proper sequence some of the products derived in commercial quantities from what would ordinarily have been poured into the rivers or thrown on the mill-dump

Lumber
Ground Wood Pulp
Sulphite Pulp
Kraft Pulp

Kraft pipe
Caustic Soda
Chlorine
Bleaching Powder
Chloroform
Carbon Tetra Chloride
Sulphur Chlorides
Hydrochloric Acid
Acetone
Acetic Anhydride
"Kream Krisp" from Peanut Oil
a cooking preparation.
Carbon bisulphide
Alcohol—hydrolysis
Oxalic Acid
Bark for fuel
Slabs and Edgings for pulp
Cottrell processon sulphate fumes.

Leaving the Sawmill behind.

Years ago the saw-mill was the whole business with *lumber* as the only product. As water power was available, the manufacture of *ground-wood pulp* was taken up. The more technical process of *sulphite pulp* manufacture followed later and has expanded into the largest sulphite pulp mill in the world. In recent years the new *Kraft Pulp* process was started in the company's Canadian holdings at La Tuque, Que. Most of this strong pulp is used for the thin brown wrapping paper which is so widely used at the present time. An interesting development is the manufacture of Kraft pipe made by reeling a wet sheet of paper into a core, drying and impregnating with asphaltum. This pipe is water-proof, strong, resistant to many chemicals and takes a thread like ordinary iron pipe.

For the bleaching of sulphite pulp, large quantities of bleaching powder are needed. It was not long before the company undertook to make its own bleach by the electrolysis of common salt. This operation gives chlorine which forms *bleaching powder* solution with milk of lime, *caustic soda* which always finds a ready market and hydrogen gas which is usually a waste product.

Chloroform secured.

In order to keep up the efficiency of the cells it was found necessary to

run continuously and this gave spare chlorine at intervals to be disposed of. In looking for processes which would take care of this surplus chlorine gas, several by-product industries were started. *Chloroform* was made by treating acetone with chlorine under certain conditions. Instead of buying acetone, the company finally bought acetate of lime as raw material and made *acetone* by destructive distillation. *Carbon tetrachloride* is closely related to chloroform and was soon another by-product. As the sulphite mill had plenty of sulphur, the manufacture of *sulphur chlorides* was started. These are the ordinary chemicals used in making acetic anhydride from sodium acetate, and it was a simple step to convert acetate of lime into sodium acetate for treating with sulphur chloride to give *acetic anhydride*, now so much in demand for manufacture of cellulose acetate for airplane "dope."

"Kream Krisp"

All this time there was the loss of hydrogen gas from the cells. By bringing the hydrogen and part of the chlorine gas together in a combustion chamber and lighting a match, the hydrogen and chlorine burned one in the other to form *hydrochloric acid*, and the mixture has now been burning several years, with practically no attention, to form hydrochloric acid, which is one of the commonest and most important acids on the market. The widely advertised and highly nutritious lard substitutes are made by treating refined vegetable oils with hydrogen to form a harder fat of exactly the same composition as the main fat in lard. The company undertook to use up some of its waste hydrogen by combining with peanut oil and the well-known "*Kream Krisp*" of the Brown Company is now a standard by-product. Not content to buy prepared peanut oil, the company bought peanuts and made its own oil.

With water power and sulphur to spare, the electrochemical conversion of coke and sulphur into *carbon*

disulphide was added to the list of by-product industries.

To make grain Alcohol.

There is now some talk of making grain alcohol (*ethyl alcohol*) from finely divided saw-mill waste by an improved process of heating the wood under steam pressure with mineral acid to form sugars by the breaking-down action known as "hydrolysis," and then extracting the sugars for fermentation into alcohol. It is claimed that *oxalic acid* can be made from the woody residue in the digester.

As a further example of careful attention to details, the company puts all its *bark* through a hydraulic press for use as fuel. *Slabs* from the saw-mill are barked in rotating "tumbling barrels" and the clean wood is then chipped for use in making sulphite pulp. Even the *edgings* are freed from bark by a hand operation of holding against a rotating drum set with knives and this material also goes into chips for the sulphite mill. In the kraft process the spent sulphate liquor always has to be evaporated and burned to recover the alkali, and the company has adopted the *Cottrell process* of electric precipitation of fumes from the incinerator to recover some alkali that would otherwise be blown out to waste.

How it came about.

All this complication of manufacture did not develop from the original saw-mill without careful study, technical skill, and financial courage on the part of the men in control of the company. At the same time there is hardly anything strictly original with the company in the whole list of by-products. What was necessary was an intelligent knowledge of the possibilities and painstaking experimental work to adapt each desired process to the company's own conditions. This has required first-class technical men with imagination and patience, as well as liberal advances of money by the company for experimental and development work. It is said that the number of dollars now spent by the company each year on re-

search work runs into six figures. This practical example of what one lumber company in America has done should show not only the possibilities for a country like Canada, but should also make the lumberman realize the broad field which he must enter in order to achieve full efficiency.

Canada Cannot Afford This!

It is safe to say that this chain of profitable and important industries, which in some departments are making great contributions to Uncle Sam's need for chemical products, were evolved from a laboratory table. It is unreasonable to contend, therefore, that the Dominion Government is overlooking the secret of industrial efficiency and commercial expansion

when it permits, the staff of the Dominion Forest Products Laboratories to be picked off by private concerns, as is now being done, for lack of an adequate salary standard. While the United States Forest Product Laboratories at Madison, Wisconsin, has had its staff increased to over 300 men during war time, the parallel institution at Montreal has lost most of its handful of technical investigators to private firms. Germany, well knowing that industrial mastery had its tap root in Science, has persistently strengthened its research facilities while Canada apparently looks to "embargo" devices to supply a trade advantage of equal potency. That may suffice for the Canadian market but will not carry a shipload of Canadian goods beyond Canadian territory.

Co-operation and Its Beneficent Results

BY CLYDE LAVITT

Chief Forester, Commission of Conservation.

The application of the co-operative idea has revolutionized the whole aspect of forest fire protection in the province of Quebec. The four co-operative forest protective associations in that province now furnish protection to more than 44,000,000 acres of forest land, including about 80 per cent. of the Crown timber lands under license.

A more recent development is in connection with fire protection along the Canadian Government Railways, long a source of dissatisfaction on the part of timber owners. Under the new arrangement, protection will be furnished the forests along the Transcontinental railway in the Abitibi district, between Parent and the Ontario boundary, hitherto afforded but little protection from fire. At the direction of the Minister of Lands and Forests, and with the co-operation of the Government Railways management, the Quebec Forest Service has arranged for the placing

of five power speeders, with two men for each speeder, on the railway between Parent and the Ontario boundary.

Worth Saving

This is a valuable pulp wood section, and the hazard is increased by the presence of many settlers, busily engaged in extending their clearings and marketing pulp wood, as well as in cultivating crops on lands already cleared. The danger from these settlers' clearing operations is minimized by the presence of some eleven fire rangers between Nottaway and La Reine, who patrol for fires and enforce the provisions of the law which prohibits the setting out of fires without a permit from a forest officer. Three portable fire pumps are to be purchased, with 1,500 feet of linen hose for each. Provision will be made at Amos for storage and maintenance of all this equipment.

Watching Engine Equipment

Another valuable development is the granting of authority, by the Government Railways management for the Quebec Forest Service to inspect fire protective appliances on their engines operating in forest sections in that province. The Forest Service has a special inspector for this line of work, who will now divide his time between the Government Railways in Quebec and the lines of railway subject to the jurisdiction of the Railway Commission, as well as lines holding provincial charters.

This outside inspection has been found by experience in Quebec and elsewhere to be of very great value in preventing the occurrence of fires due to railway causes.

The Government Railways management is also co-operating with the St. Maurice and Southern St. Law-

rence Forest Productive Associations in maintaining a special fire patrol through forest sections between Parent and Quebec, and between Quebec and the New Brunswick boundary, respectively.

For right of way clearing to reduce the fire hazard, the Government Railways have employed an extra gang of 22 Indians to cut brush and dispose of inflammable debris between Parent and La Tuque. Labor is so scarce in that district that the hiring of the Indians was the only way to get the work done.

These developments, taken in connection with those of a similar character in New Brunswick and Ontario, show conclusively that the Government Railways Management is taking a much more active interest in forest fire protection than was ever the case in previous years.

The Forest Possessions of Spain

The Forest Possessions of Spain.

According to the data obtained for the year 1913-1914, the forests declared of public utility, which depend on the Ministry of the "Fomento," cover in Spain and the neighbouring islands an area of 11,886,349 acres, 29,888 acres less than in the year 1912-1913 due to a rectification of the boundaries. These figures include 609,379 acres (i.e., a little more than 5% belonging to the State, 11,261,746 acres belonging to communes, and 15,224 acres belonging to other public bodies.

Of the total area, 1,020,304 acres (i.e., 8% of the acreage of public forests) are being divided up for cutting and 288,891 acres of mountain land are being regenerated and replanted.

The various kinds of trees found in the forests are distributed as follows: 5,263,223 acres of full-grown pine, oak and beech; 3,088,860 acres of brushwood and pasture land. The income from these forests is estimated at \$412,247 (*at par*).

The forests, with fertile lands, are the great pillar of Canada's commercial existence. If the Kaiser can witness the ruin of our national foundations by our own indifference, why should he go to the expense of employing secret propagandists and T.N.T. kulturists? "Forest Conservation in Canada," says the British Reconstruction Committee, "is an Imperial question of the first magnitude which deserves immediate attention"; for Canada now holds the Empire's only timber supply.

It is clearly up to Canadians themselves to make this problem their personal concern. The growth of conservation sentiment is outside the zone of Government action. It cannot be done by "passing a law." Each Canadian must pass his own law.

Tank Cars in Fighting Fires



Mechanical equipment has demonstrated its value in controlling forest fires and its use is rapidly increasing, now that labour is scarce and it is often difficult to assemble men promptly to prevent a fire spreading. The upper illustration shows a fire-fighting tank car, equipped with 4,000 ft. of 2½-in. hose, hose rack and pump, maintained by the Canadian Pacific railway for the control of fires along its lines in the Muskoka district, Ontario. The lower illustration shows the equipment in actual use at a fire in cutover forest lands, where the debris on the ground constitutes a source of great fire danger.

Tank cars and pumping outfits are also in use, to a limited extent, on portions of the Grand Trunk, Transcontinental and Timiskaming and Northern Ontario railways, and have thoroughly demonstrated their effectiveness. Portable pumping outfits for forest protection purposes, are used by the Dominion Parks Branch, Dominion Forestry Branch, British Columbia Forestry Branch, Ontario Forestry Branch, Canadian Pacific Railway Forestry Branch, and by the St. Maurice, Ottawa River, Laurentide and Southern St. Lawrence Forest Protective Associations.

The Last "White Man's Country"

British East Africa and German East Africa are probably the last examples of white colonization, in the strict sense of the word, that will take place on this globe, for no more "White man's country" remains. In both these countries there has been a new departure in the settlement of the land. In place of the waste and

forest destruction which occurred when the Spaniards colonized Mexico and South America, the Anglo-Saxon, North America, and more recently, the British, Australia, *forest demarcation* both in German East Africa and British East Africa was the first step taken in the settlement of the country.

England's Forests Sacrificed to War

Nature Wears Another Aspect in the Once Splendidly Wooded Sections.

Although the Germans have not set foot in England and the horrors of invasion have been spared the country, nevertheless its natural aspect is undergoing a great change due to the war. The beautiful woodlands, forests, woods and groves that for centuries have made its landscape of unrivalled beauty are fast disappearing under the axes of the Government's lumbermen. It is only a question of time, according to the report of the forestry sub-committee of the Reconstruction Committee, before the whole of the country's growing timber which is fit for commercial use must disappear. Even if every acre felled is replanted, it will be many years before the present output can be repeated.

It is estimated that by the summer of this year the Government and the lumber trade will probably be converting trees into timber at the rate of 6,000,000 tons per annum, or more than half of our total imports of timber on the last year before the war. Indeed, the need of timber is so great and imperative that it is feared by the end of next year the Government will have to cut all the remaining substantial blocks of mature coniferous timber in the country. And by substantial blocks is meant any patches of any size whatever suitable for cutting. It is only too probable that this destruction of the beautiful woods of England will have to go on to the bitter end, as the demand for timber is a continuous and compulsory one so long as the war lasts.

A Picture of Destruction

What it means in a given district is illustrated quite close to London, at Farnham in Surrey, less than forty miles from the capital.

This district has been bled almost as much as any in the south, and what has been done is but a foretaste of what must follow. For miles it is

hardly possible to be out of sight of areas which have been completely cleared or are littered with freshly gashed and trimmed trees or of woodlands in which the standing timber is already marked for destruction. From Crooksbury to Tilford, to Churt by Frensham and back to Farnham, everywhere is the same picture of destruction; forests cleared except for a shelter belt to protect new saplings, entire woodlands gone save for a few marked trees, trunks, and logs in thousands lying where they fell and awaiting removal.

At Blacklake a new camp is being erected for Canadian lumbermen who will cut down the tall red tufted pines and lay bare a great swath of country from the Farnham road across the woods of Waverley and Moor Park to Crooksbury Hill itself. This is just one example of what is going on all over Great Britain, Welsh, Scotch and the Lake country vales, that is, the Vale of Conway and the Vale of Llangollen and certain parts of Cumbria, show the forest loss most because whole mountains have been cleared and the destruction is most apparent on high country. In Devonshire great areas have been cut down to the north of Exmoor and many other localities, and several companies of the Canadian Forestry Corps are working in the country.

In the New Forest there has been a very heavy cut of the fine old timber. In Bedfordshire, the woodlands of the Duke of Bedford and of Viscount Peel have suffered tremendously. Virginia Water, Windsor Forest and the Sunningdale region have been cut over by Canadian lumbermen, who are also cutting near Wellington College and Sandhurst, as well as on the South Downs in Eartham Woods. In Suffolk and Norfolk the forests are falling rapidly. Historic seats are not spared. The woods of Beaulieu have been well cut out and the mag-

nificent silver firs at Longleat in Wiltshire, many of them six feet in diameter, are falling. From the magnificent high forests of Spanish chestnut trees at Welbeck Abbey at least a million feet are to be cut.

The Home of Trees.

These details give but a faint suggestion of what is going on from one end of Great Britain to the other. Without having put foot on England the destructive influence of the Germans is seen in the disappearance of its incomparable woodland beauties. It has been largely due to its trees and woodlands that England has always ranked among the most beautiful of European countries. Its climate and its extraordinary variety of soil have been peculiarly favorable for the growth of trees in unusual variety. Its freedom from great extremes of heat and cold have made it the home of trees unknown in many parts of northern Europe. In its limited area a greater variety is to be seen than can be observed in immensely larger areas on the Continent.

In a journey of fifty to eighty miles from London to the Channel one finds hedgerow elms, thorns and oaks of the meadows, silver birches, chestnuts and many conifers of the lower commons; the willows, alders and poplars of the valley; the ancient thorns and hollies of the higher commons; the beechwoods of the North Downs; the white bean, yew, juniper and box on the greens and ridges and the forests of mighty Scotch pines, silver firs, larch and the great oaks of

the Weald; the conifers and chestnuts of the Hastings sand forest region, and then the elder, ash and thorn of the eastern end of the South Downs, and the beech, birch, sweet chestnut, ash and mighty yew at their western end. And this variety is not only typical of the nearby counties, but more or less of all England, Scotland and Wales.

With the exception of certain exotic trees brought here and there, perhaps by the Romans, it is pretty clear that the trees down to the seventeenth century were all native. In that century, the conifers were introduced, and Develyn, the great authority on British forestry, includes in his list the Scotch fir, the only native of the family, the silver fir, the Weymouth pine, the spruce and the larch. In the eighteenth century large plantings were made of the larch. This introduction of the larch and other conifers not only added new features to the beauty of the English woodlands, but also has proved to be as great a resource of England at war as the hearts of oak of old.

While most of England's woodlands had been created primarily for game coverts and landscape effects, state forests were for centuries cultivated to meet the needs of the navy. The oak of the Forest of Dean has been known as the best ship timber in the world, and English oak is still the finest for that purpose, while the best of the soft woods, spruce and pine, is second only to the finest woods produced in northern Europe.—*New York Sun.*

Conquerors Exploit Russian Forests

The thoroughness with which the Germans have set about to exploit the forests of that part of Russia which they have occupied is made evident in an account published in *Traevanu Industriem*, written by W. Franz, and translated by the *Timber Trades Journal of London*. The account says:

"We arrived from Warsaw via Brest-Litovsk over the Bug at the

Gajnowska station, on the western edge of the extensive and valuable forest, which forms the southwest corner of Lithuania. After a further journey of an hour, we came to Bjelovjerska, a large clearing with three small villages and a hunting-box, formerly belonging to the Tsar. In the building, which is surrounded by a beautiful park, there now resides a German military forest admin-

istration, with all the necessary appurtenances stocks of materials, workshops, machinery, etc.—and the duty of this administration is to provide from the contents of the forest all the various productions which are necessary for the war. The long entrenchment warfare demands great quantities of round wood, and also enormous supplies of wood manufactured in the form of fuel, charcoal, wood wool, wood thread, etc. Wood saves blood is the motto, and regular and plentiful supplies at the front are therefore considered of the very highest importance.

War Prisoners Work

“It is very essential work which is here being undertaken; it requires skillful management and powerful arms. In the Bjelovjerska forest department there are about 25 wounded officers, who, with some hundreds of junior officers and others of lower rank, superintend the work, which is performed by many thousand prisoners of war and the civil population of the place. The huge forest which covers an area of more than 100,000 hectar, is divided into many inspection districts. At the head of each is a forest expert. To one of these we drove in a hunting carriage. Our lonely way led through the wonderful forest, whose century-old trees sheltered the soldiers of Charles VII and Napoleon. Predominant are unusually straight-grown pines, yielding a wood of excellent quality. About a quarter of the whole forest consists of deciduous trees, among which the oak and the ash are of special interest. As we drive, we feel very thankful that our armies have been successful in capturing and using rationally these enormous stretches of forest, to the great benefit of our own native supplies, which can thus be better conserved than would otherwise be the case. On either side of us lie felled the huge giants of the forest. The branches are first lopped off on the spot, and the trunks are then drawn by horses and oxen to the forest railway for transport to the mills. To get out the large trunks by cattle alone

would be a work of great difficulty and, considering the need for horses for the army, would be a slow process. As it is, the locomotives convey daily hundreds of trees from the forest, as well as taking the workmen to the more distant parts for felling.

Boards for Front Trenches

“We take one of these trains, and find ourselves at a sawmill. Before it is the piling place where the logs are collected and sorted before being sawn. For the front are especially needed boards of certain dimensions, of which ‘unterstande’ and shelters are constructed. For this purpose, and in order to utilize the full capacity for the railways, the saw mills have been erected in the forest. Each inspector superintends one of these mills, and they are so arranged that the raw material can be taken in at one side and the manufactured wood come out at the other. Those mills which cannot be established by the railway are connected by sidings with the main line. The saw frames are driven by engines fed with wood fuel; water and wood chips are the daily bread of these machines, which drive not only the saws, but deliver also electric power to the dynamos. The sawmills, the piling yards, the prisoner’s quarters, and the barracks of the civil population are lighted by electricity.

Thousands of Workers.

The forest inspector who received us treated us with the greatest courtesy, and told us a good deal about the life and work in the forest. To support, in these primitive regions, and to look after many thousands of workmen—Russians, Poles, Jews, men, women, and children—is no light task. It has been solved by quartering the prisoners as near to their place of work as possible in small camps, which have excellent sleeping arrangements, with washing-rooms, reserves of food, workshops, wells, hospitals, and other hygienic arrangements; while, on the other hand, free dwellings have been provided for the civil population, as well

as free places of entertainment and amusement. Spreading the work-people over such a wide area has naturally rendered the food problem very difficult, but at the same time it has been an advantage in the continual struggle against epidemics and disease.

Take off Bark for Tannin.

"In our journey we passed many of these work places. At one spot the trees were being barked, in order to obtain the tannin substances; at another, the branches were being lopped off, for the making of telegraph poles; at a third, a division of men were busy with the manufacture of railway sleepers; and at another, barrel-making was in progress. Now we pass a tar factory, which the former owners had attempted to render useless, but which the forest inspector had quickly repaired.

"What we saw in one inspector's division was repeated in the others; but the strongest impression was made by the great buildings and factories near Gajnowska Station. A great manufacturing town, with huge sawmills, has arisen, and probably the largest charcoal works on the continent are now established here, as well as numerous other industries."

WITH A FORESTER IN FRANCE

The following is an extract from a letter from Private F. Bruce Robertson, of the 3rd Canadian Division Artillery Signals, France, to the Director of Forestry, Department of the Interior, Ottawa, to whose staff he belongs:

It is Sunday. The outfit is out on rest and there are no parades. The old lady by whose fire I am sitting has asked me if I had plenty of tobacco. I thought it a hint so asked if she smoked. "Oui," says she, "mais tobacco fini en France." You can picture her now puffing away at an old clay pipe on the other side of the fire-place. She had an earache half an hour ago, but that is forgotten now. Coffee is making in a black saucepan on the fire, so I foresee a pleasant morning for both

of us. Outside it rains. It is one of those big fireplaces, you know, extending across one side of the brick floored room, and I have a cozy seat under the arch. We have a brick oven in the wall also, in which she made bread for refugees yesterday. Old style baking and the best, in which a brush fire is made in the oven, then coal raked out and the bran loaves put in. Had a sample of the bread, just a little, in fresh warm milk last night, and it went fine.

"For the past month I have been mounted lineman on a cable section. We have been doing considerable work laying lines off the wagon. You may have seen the signal company in training practising the same about Ottawa. This is over for the present. Life is simplicity itself in this country village with a nightly game of ball to relieve the monotony. Our one other amusement is watching the local shepherd and dogs herd the community flock of sheep.

"As a "Y" worker you will be interested in knowing that our ball outfit is supplied by the Y.M.C.A. All sorts of sporting goods are handed out, including phonographs, and the troops appreciate the work.

AN INDUSTRIOUS PLANTER.

One of the good friends of the Canadian Forestry Association, residing at Boston, Mass., is Mr. Frank A. Cutting, a large dealer in hemlock bark. Mr. Cutting has taken a lively interest in tree planting and at the present time is setting out 25,000 pine trees a year and sowing a quantity of pine seed. With the cost of nursery stock, the value of the land, and expense of planting and protection, Mr. Cutting anticipates no profit from his venture, but is greatly interested in the idea of replacing some of the forest materials and thus conferring a benefit upon future generations.

Can we afford higher pensions?

Can we afford forest fires? Every fire cuts down the chances of higher pensions.

An Empire Partnership in Forestry

By M. C. Duchesne, well-known British Forester.

A Plan to Develop More Profitable Relations With Great Britain's Wood Consumers

Let us consider the position of Canada—and with Canada I include Newfoundland.

Canada contains the only vast resources of timber within the Empire.

Figures show that Canada in 1913 sent us only 10 per cent. of our imports of coniferous timber and pitwood. That country has the largest reserves of probably the finest timber in the world and of the varieties most suitable for our requirements. Is there any reason, apart from the matter of transport, why in the future the 10 per cent. should not be increased enormously?

In the past the cost of transport from the Baltic was low in comparison with that from Canada, partly on account of return freights and other special facilities. Given cheap freights and special exchange of trade with Canada after the war, this comparison might not stand in the future.

Canada's Advantages.

Let me enumerate some of the advantages of organising British and Canadian forestry on broad lines, looking to Canada for mature timber while creating reserves by afforestation in Great Britain.

I would first emphasise particularly:—

The geographical position of Canada and its distance from the war area.

That lumbering is one of the principal industries of Canada and can be extended promptly and indefinitely.

That Canada possesses exceptional natural facilities relating to water transport and other advantages.

Now as to mutual advantages:—

Firstly, Canada has unlimited supplies of Douglas Fir, the "Oregon Pine" of commerce, pre-eminently

suitable for constructional work and many other important purposes, as has been abundantly proved in its world-wide markets.

Secondly, Canada possesses also unlimited resources of other species of timber, particularly varieties of Spruce, the "White Deal" of commerce. The timber of Spruce is used in great quantities in this country, and selected parcels of Canada's Sitka Spruce are in large demand for the construction of aeroplanes. Canada has also the *Thuja plicata* (known in British Columbia as "Western Red Cedar"), one of the most durable trees in the world, as well as Weymouth Pine (the "White Pine") of commerce and other important trees, including various hardwoods.

£5,000,000 for Pulp.

Thirdly, our annual bill for wood-pulp for paper-making totals five million pounds. This material can be supplied in conjunction with pitwood from the forests of Canada, and the manufacture of pulp is one of the most flourishing industries of Canada.

I have said sufficient as to timber supplies, now as to forestry:—

(1) Douglas Fir, Sitka Spruce, and other timbers which Canada will send us and which our markets require are the very trees we should plant here on a large scale for afforestation. Spruce is the most suitable tree for much of our waste hill land, and Canada's Sitka Spruce is advocated for planting on a large scale. Spruce timber has unlimited uses here and is the best wood for pulp as well as for pitwood. For the valleys or the better soils, Douglas Fir is the most promising tree to plant. There are many other Canadian trees that may usefully be cultivated here.

(2) Canada can teach us many useful lessons, particularly in organ-

isation, the commercial utilisation and marketing of forest produce and the technology and uses of wood.

(3) Great Britain can give Canada facilities for studying the commercial utilisation of timber in this country, so as to develop the markets here for Canadian timbers.

(4) Canada has mature forests of Douglas Fir and other timbers which we desire to produce in this country, and therefore wish to study. We shall require also quantities of tree seeds of the best types from the forests of Canada.

(5) Great Britain has old scientific societies and unique facilities for scientific research, and is also in close touch with Continental centres and facilities for practical and theoretical forestry education.

We should make amends for our past indifference and start a national campaign to encourage forestry, not only in Great Britain, but throughout the British Empire.

Big Arrears in Building.

Enormous demands will be made for timber throughout this country and nearly all Europe for reconstruction after the war. The matter will, therefore, compel the utmost attention. After hostilities have ceased, there will naturally follow a transition period before normal conditions return. During this time, unless our main supplies of timber can be obtained from Canada, we shall be only one of many eager competitors for those of Russia and Scandinavia. A certain proportion of the Baltic supplies will be forthcoming from the sources developed before the war, but it is doubtful how far this quantity will go towards meeting our requirements or at what cost it will be obtainable.

There are big arrears of repairs and reconstruction on our railways, in industrial undertakings, and in private establishments. For these and other developments large quantities of timber will be required.

something of life at the front during the last four years, can realize what an enormous quantity of timber has been taken from this country for war purposes, and what an enormous amount of planting and tending of trees will be necessary to replace it. Unfortunately foresters who really understand all that afforestation means are not numerous in England, and though the necessity of educating youngsters for the work has received much more serious attention in the last few years than it ever did before, when our methods—as in many other things—were haphazard, the facilities are still hardly sufficient to give us enough foresters to cope with the demand.

RUINED FORESTS OF VERDUN

Lovers used to stroll arm in arm through the well-ordered forests of Verdun. To stroll arm in arm where these forests once stood is no longer possible, Gouverneur Morris writes in *Collier's*. You must go alone. If there has been rain you should have nails in your boots. The smooth convolutions of the hills have been tortured and turned into ridges and hollows like the Atlantic ocean during the equinoctial gales.

I doubt if there is to be found one single square yard of the original forest floor. I doubt if there is to be found one single perfect example of a shell crater. One crater breaks into the next, and there, merged into one shocking hollow, are a dozen which at the first moment of looking appeared to have been but one.

It has been well but truly "worked," that forest floor; but not for 100 years can it ever again be worked by man in any peaceful and profitable pursuit. Rich soil (doubly rich now,) it will be shunned by the farmer with his plow; a prospect very rich in copper and iron, the prospector will shun it, for here, buried and half-buried, the shells, great and little, which did not explode at all, are as thick as temptation in the life of every man.

FORESTRY AFTER THE WAR.

Westminster Gazette; Nobody, except those of us who have seen



MALIGNE CANON, JASPER PARK.



1108

"A short turn and the greenness vanished! All life succumbed, as if roared down by the cannons, by the howling and pounding that hammered in the valley like the pulsating of a colossal fever. Shell hole upon shell hole yawned down there. From time to time thick, black pillars of earth heaped up and for moments hid small parts of this desert burned to ashes, where the cloven stumps of trees, whittled as by penknives, stuck up like a leering challenge to recognize the landscape this once had been, this field of death and refuse, before the great madness had swept over it and sown it with ruins, leaving it like a dancing floor on which two worlds had fought for a loose woman."—From "Men in War," by Andreas Latzko.

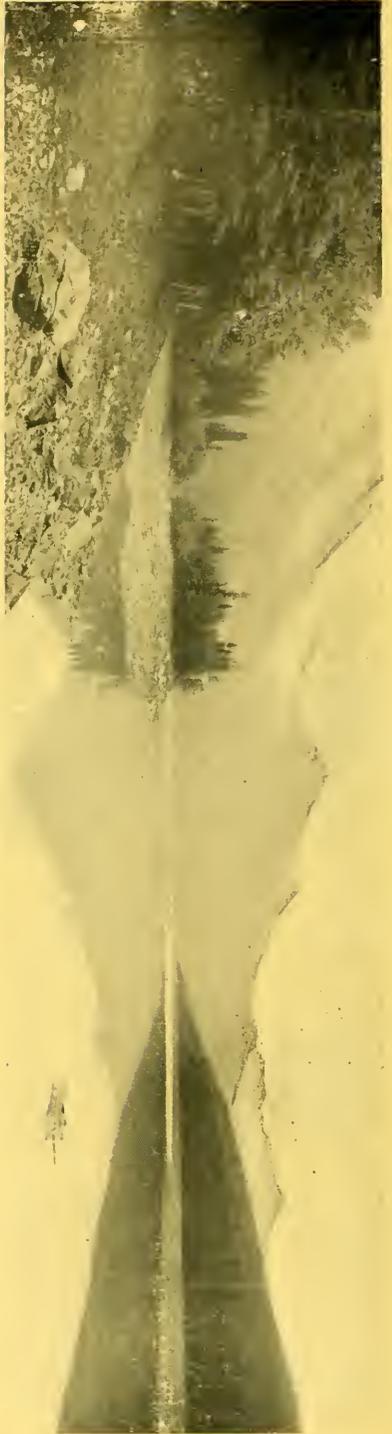


A Lookout Station on Green Mountain, B.C., built by Dominion Forestry Branch. From this high point the fire rangers have an unobstructed view of great areas of forests and can easily detect an incipient fire.

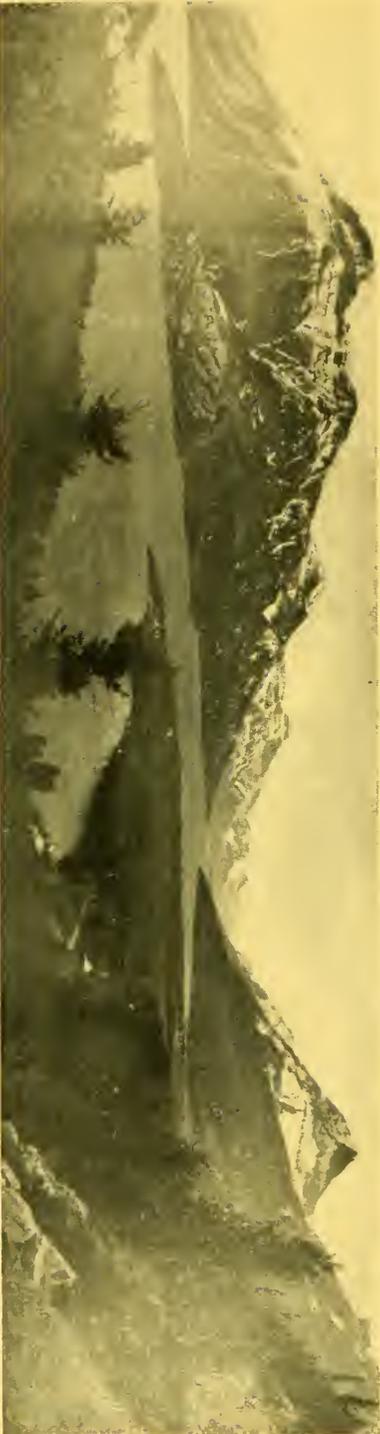


Utilizing the smashed trunks of trees for trench protection.

Photograph taken on the Canadian front at Ypres.



Medicine Lake, Jasper Park, B.C



Waterton Lakes, from the Narrows

Great Timber Wealth of South America

BY H. N. WHITFORD

Prof. of Tropical Forestry, Yale University.

Let us take a survey of some of the tropical forest regions of the world and see what the possibilities are. One of the most active industrial tropical and semi-tropical regions in the world is southern Brazil. According to a report of the Brazilian Government, the forested area of this region of Brazil is estimated at 1,058,000 square kilometers (approximately 260 million acres). There are two fairly distinct forested regions—the coastal and plateau. The former has a high annual precipitation and, for the most part, a high temperature. In no place is it far distant from tide water. It is heavily forested. Unfortunately there are no estimates of the total amount of timber. H. M. Curran has examined a large timber property in the mountains back of Bahia and finds the forest has an average stand of about 10,000 board feet per acre; according to the types, the stand will vary from 6,000 to 13,000 feet per acre. About 10 species will furnish the bulk of the cut. He estimates that comprising 42 per cent of the cut are soft hardwoods similar to yellow poplar. Thirty per cent are similar to maple and ash in hardness and 28 per cent harder than white oak. The softer species are little known on the markets, but could be introduced and substituted for the uses for which imported pine is employed.

The plateau district lying behind the coastal mountain ranges has lower temperature and rainfall. In places it is fairly heavily forested with hardwoods and Parana pine.

The hardwoods are usually confined to the valleys, though patches of them are found on the uplands. Simmons states that in Parana one company claims ownership of connected forest tracts of Parana pine, a

large part of which is in a primitive state, aggregating three billion feet and averaging about 4,000 feet to the acre. There are sections where the growth is thick and large; the stand scales as high as 15,000 to 20,000 feet to the acre.

Outdoes Southern States

The above are the only available figures that give any indication of the volume of the forests. Assuming that the estimate of an area of 260 million acres for the region under consideration is correct, divide this area by two to make a liberal allowance for non-merchantable forests, clearings, etc., there will remain 130 million acres covered with merchantable forests. At 5,000 board feet per acre this will give a total of 650 billion feet. It is believed that this estimate is very conservative. At any rate, for all practical purposes it is sufficiently accurate.

There is nearly twice as much standing timber in this region as in the southern yellow-pine forests of the United States, the most active, lumber-producing centre in the world with an annual cut of 15 billion feet.

Rich Amazon Regions

The Amazon forest can be regarded as the greatest reserve forest of the world. While it is not as near to lumber-consuming centres as the other forest regions that have been mentioned, water transportation alone considered, it is nearer to the great centres of the eastern United States and western Europe than the Pacific Northwest. Aside from climatic conditions, there is no other forest region that has its physical conditions so well adapted to lumbering. There are literally thousands of miles of navigable rivers and many more thousands that are drivable. Ocean steamers ply up to rivers over 2,500 miles from the coast. Moreover,

little of the area is over 1,000 feet in altitude. The climatic conditions are not so bad as non-dwellers of the tropics make them out to be. Besides Para, a city of 200,000 people, at the mouth of the Amazon, there are Manaos, a city of 80,000 people nearly 1,000 miles inland, and Iquitos, Peru, with about 20,000 inhabitants, about 2,500 miles inland. These cities now all have modern sanitary

conditions and are otherwise modern. Yellow fever is practically a thing of the past. So far, a single forest product, rubber, has been the principal source of revenue for the region. Next to coffee it leads all others in the value of the exports of Brazil. The lumber industry is practically undeveloped. Only a small amount of lumber for local use and export is cut and some is imported.

The Forests of New Zealand

BY SIR WILLIAM SCHLICH

Forest including scrub, originally covered the greater part of the islands, but its area has gradually been reduced. In 1886 the area under forest amounted to 33,120 square miles, and in 1909 to 26,678 square miles, being a reduction of 6,442 square miles, equal to 20 per cent., in 23 years. In 1909 the proprietorship of the forests stood as follows:—

Crown forests, 12 per cent. of total area, 12,357 sq. miles.

Permanent reserves, 3 per cent. of total area, 3,298 sq. miles.

Alienated forests, 11 per cent. of total area, 11,023 sq. miles.

Total, 26 per cent. of total area, 26,678 sq. miles.

It will be seen that 59 per cent. of the forest area is still the property of the State, and that 41 per cent. have been alienated, or is Maori owned.

The *output of timber* in 1913 amounted to about 358 million superficial feet. The imports and exports in 1913 were as follows:

Imports, 33,484,952 superficial feet, value £303,012. Exports, value £319,650.

As regards value, the two items are, practically, the same. It is necessary to point out here that the value of the imports per 100 superficial feet came to just over 18s. The imports consist chiefly of Eucalypts from Australia, especially iron-bark and jarrah coniferous timber from the United States, Canada, and the coun-

tries around the Baltic. The exports were chiefly kahikatea, kauri, rimu and beech.

Future Management

As stated above, the output in 1913 amounted to about 358 million superficial feet. Experience has shown that the requirements of the Dominion are steadily increasing, and it has been estimated that they will have risen to double the present amount, or 720 million superficial feet, in the year 1945, by which time the present stock of milling timber would be exhausted. This conclusion was based on the assumption that the population would be doubled by 1945, and that the increment of the forests was far too slow to keep pace with the annual cuttings. Starting from these premises, the seriousness of the position was recognised some time ago, and already in 1896 an Ordinance was passed inaugurating a system of State nurseries and plantations, so as to make the country self-sufficient in the future. Under this Ordinance, operations were at once commenced, and by 1909 an area of 12,715 acres had been planted with a great variety of exotic species.

Some of the worst forest fires in Canada this year were caused by picnic parties neglecting to extinguish their camp fires.

Never leave a camp fire until it is Dead Out!

The Returned Soldier Must Be Protected

The necessity of having all Canadian lands intended for soldier settlement properly examined by expert Agriculturists and Foresters has been championed again and again by the Canadian Forestry Association in its various publications, public meetings and newspaper campaigns.

A strong stand in favor of expert demarcation of lands is taken by the U.S. Secretary of the Interior, Franklin H. Lane who brings to the President's attention the duty of the republic to safeguard the returned soldier from locating on non-agricultural soils. Much of what the Secretary says is directly applicable to Canada.

"Any plan for the development of land for the returning soldier will come face to face with the fact that a new policy will have to be worked out to meet the new conditions. The era of free or cheap land in the United States has passed. We must meet the new conditions of developing lands in advance—security must to a degree replace speculation.

"Every country has found itself facing this problem of caring for returning soldiers at the close of a great war. From Rome under Caesar to France under Napoleon, and down even to our own Civil War, the problem arose as to what could be done with the soldiers to be mustered out of military service.

Not half Cultivable.

"At the close of the Civil War, America had a situation similar to that which now confronts it. Fortunately at that time the public domain offered opportunity to the home returning men. The great part those men played in developing the West is one of our epics. To the great part of returning soldiers land will offer the great and fundamental opportunity. Official figures show we have unappropriated land in continental United States to the amount of 230 million acres. *It is safe to say that not one-half of this land will ever prove cultivatable in any sense.*

British Guiana's Timber Riches

British Guiana produces some of the finest timbers in the world. Those that are at present most commonly exploited are Crab wood; Greenheart, largely used in the construction of the Manchester Ship Canal and in the construction of lock gates for the Panama Canal; Wallaba; Balata or Bullet Wood; brown and yellow Silverballi, Letter or snake wood; red Cedar. These woods are suitable for building purposes and the making of furniture. Wallaba and several other kinds of wood are used for fuel as a substitute for coal. The forests also abound in soft woods which are suitable for making paper pulp, yet not a single pulp-making factory exists in the Colony.

Other products are Balata, the

dried latex of the Bullet tree; the exports of this gum are over 1,000,000 lbs. per annum, the bulk going to the United Kingdom; Locust gum, used in the preparation of varnishes; Tonka beans; Vanilla beans; Palm nuts of various kinds which are plentiful and could doubtless be turned to commercial value as oil producing factors; Souarri nuts, larger and finer than Brazil nuts. Plants of medicinal value also abound, of which no use whatever is now made.

This is a dangerous season for forest fires! If you neglect to extinguish your camp fire, if you throw away lighted matches or tobacco, you have written an invitation to Disaster.

The Second Crop of Pulpwood

BY H. C. BELYEA

(Graduate, Forest School, University of New Brunswick; Instructor in Forest Engineering, New York State College of Forestry, Syracuse, N. Y.)

An Antidote to the Pessimistic conclusions Based on Rate of Growth in Virgin Forests.

The prediction of the rate of growth for second growth forests after lumbering, from the performance of the original stand is a common source of pessimism among lumbermen. Technical foresters have an unfortunate tendency of basing their growth predictions upon the performance of the species under virgin conditions. The conditions for growth after lumbering are much different than they were for the original forest, due principally to the freedom of the survivors from root and crown competition. Attention is called to an article on the reforestation of pulpwood lands, published in the December 1917 issue of the Canadian Forestry Journal, in the hope of a reinterpretation of some of its conclusions.

Virgin Forest Conditions

A forest as grown under virgin conditions, consists of two main divisions; an upper or main portion consisting of the actual merchantable and productive trees, and a lower or under forest of small and young trees which form the basis of the potential forests of the future. While the existence of the latter is dependent upon the presence on, or near the site, of trees big enough to produce seed, it is distinctly not a part of the productive portion of the forest.

The existence of a tree, big or small, in a forest, is absolutely dependent on the presence or absence of certain conditions for tree growth which are termed the factors or resources of the site. Only under stimulation of these factors is tree growth either initiated or continued. These site factors are several in number, but crown light and soil moisture are the most important.

The presence of a lower growth of

seedling or small trees under the crowns of the main trees of the forest is concrete evidence that either the resources of the site for tree growth are in excess of the demands of the trees now present, or else the crown cover of the main forest is temporarily less dense and represents a less number of trees than the potential ability of the site for tree growth. This small seedling, and often suppressed, growth of stunted trees occupies both in the air above and in the soil below space properly ascribed and credited to other and bigger trees. Hence it cannot be reckoned as an item of the productivity of the site, but rather as a potentiality. It exists only by sufferance of the minimum demands of the overwood, and it is maintained only so long as these demands are not in excess of the supply. Hence it cannot be counted as part or parcel of the productive forest nor as an actual item of the forest production.

Growth in volume in the individual tree for any site is dependent upon the size of the crown, which in turn is indicative of the size of the bole and the development of the roots. Growth in volume is also more a factor of size than age. Twelve inch trees in any forest will show only the average growth of 12 inch trees as grown in that forest, irrespective of whether their age be 75 or 175 years.

The life history of softwood in virgin mixture is a series of struggles to get light and develop a crown; struggles that are feeble in early age and more progressive as the tree attains size. Each phase of suppression and release leaves its record in the alternating zones of dense and wider ringed wood in the bole of the tree. In virgin forest the release

of the overtopped softwood is directly dependent upon openings in the upper canopy. It is an undeniable fact that these openings are more readily and quickly seized by the closing together of the surrounding hardwood crowns than by the growth of the softwood from beneath. The effect of these openings is the acceleration of the growth of the understory softwoods, and the closing together of the crowns retards it. This continues until the individual softwood tree is able, by its height, to thrust its own crown into the opening and to seize it for itself.

The Effect of Cutting

The pulp man, however, is not interested in the time required by a tree to reach a place in the main canopy. The length of time covered by the period of initial suppression is variable and represents not so much a definite period of time as a condition to be endured in the young growth of all softwoods in mixture. And as such it should be regarded in the predictions of growth. The lumberman is not so much concerned with the age of the trees remaining, as with their size, their number and their subsequent growth. Suppose that it does take 100 years to grow 5 inch Spruce or Balsam tree in virgin mixture. That is of very little consequence provided that there are enough of them and that in the period before the next cutting, 50 years perhaps, they will increase their diameter by 8 inches, making a total of 13 inches, a supposition not beyond expectation with either Spruce or Balsam. Increase in the rate of growth of all trees is the immediate effect of cutting. In illustration of this, Figure No. 1 is submitted, which shows the average diameter growth on the stump before and after cutting. It is based on the measurement of 313 Red Spruce trees on Brandreth Park in the Adirondack Preserve, New York State.

The recovery of a tree from suppression is dependent upon the proportionate size of the crown and the development of the roots. It is not to be thought that the immediate

effect of the removal of the overwood and the entrance of the crown into the light is a corresponding increase in growth. Even when the tree is but lightly shaded, it takes some little time for it to make full and complete recovery and show an acceleration of growth. The removal of the overwood has not the same effect as if the trees came up into the light through the processes of growth, and a period of readjustment is necessary, before they begin to show an increase in the rate of growth.

The recovery is slowest on the biggest trees and most rapid on the smaller members of the underwood. Yet even with the smaller trees it takes from 4-5 years for the tree to make recovery and show an acceleration of growth. With the bigger trees this time is longer. Attention is called to Figure No. 2 in illustration of the period of readjustment in Spruce after cutting. While this figure is made out on the basis of height growth only, it will be understood that curves based on either diameter or volume growth for the same period would show exactly the same trend. This study is based on the measurements of 316 Red Spruce trees at Wanakena, N.Y. The first few years after the cutting there is no acceleration or increase in the rate of growth. It will be noticed that the recovery and acceleration of growth was quickest with the smallest sized trees.

Need of Light and Room.

In reality, the whole process of growth hinges upon the release and development of the individual tree. The development of the unmerchantable portion of the stand can only be accomplished by giving the component individuals their requisite light and room. In the meantime there is a potential forest immediately available represented by the 4, 5, 6, and 7 inch trees now present in the stand, on which the lumberman can depend for his wood supply until the small suppressed material can make the expected recovery, and begin to take its place in the actual productive portion of the stand.

TOTALS OF ALL CLASSES

Peeled Red Spruce
Brandreth Park, N.Y.
August, 1917.
313 Trees.

Cut over for Softwood during
Winter of 1897.

Average Diameter inside Bark in Inches on the Stump		Diameter Growth in Inches in 20 Year Periods		D. B. H. Class		Number of Trees	Average Annual Height Growth in Feet		
		'77-'97 Before Cutting	'97-'17 After Cutting	1897	1917				
1877									
6.0	1897	7.9	10.3	1.9	2.4	6	8	57	.37
6.4		8.2	10.8	1.8	2.6	7	9	91	.435
7.1		8.9	11.9	2.1	3.0	8	10	80	.460
7.5		9.6	12.8	2.1	3.2	9	11	48	.490
8.0		10.5	14.1	2.5	3.6	10	12	29	.36
8.4		10.9	14.8	2.5	3.9	11	13	8	.344

FIGURE NO 1

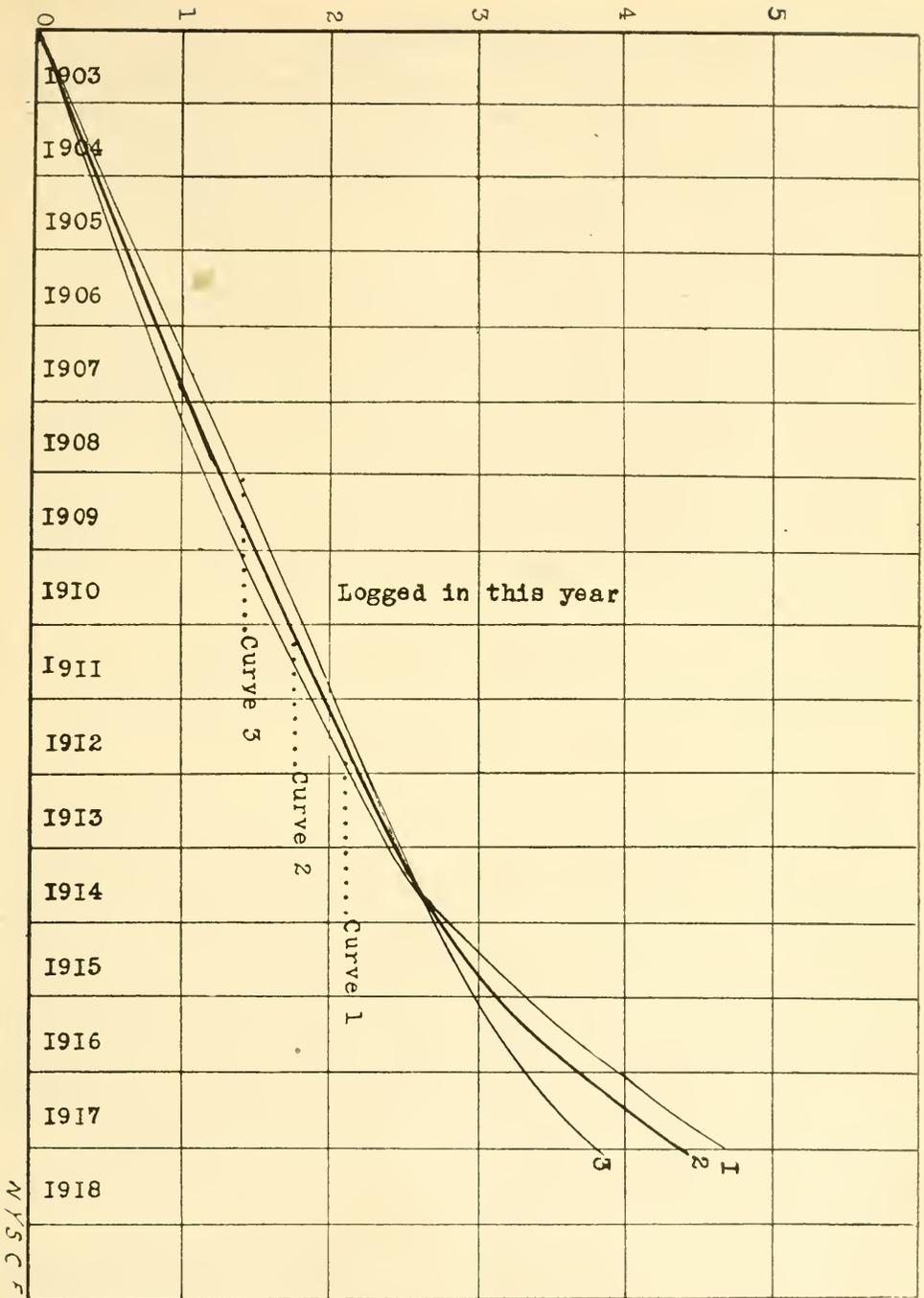


Figure: 2 Height, Growth of Red Spruce for the 15 years following, 1902. The area was logged in 1910. Note the 4-6 years of readjustment before the acceleration of growth following the cutting. Made from a study of 316 trees on the lands of the Rich Lumber Co., Wanakena, N.Y.

- Curve 2. Average height growth of 36 trees, 1-11 feet high, '02.
- Curve 1. Average height growth of 99 trees, 2 " " '02.
- Curve 3. Average height growth of 29 trees, 10 " " '02.

Due to the fact that this small suppressed material receives this optimum condition for growth at an earlier age, it can be expected to arrive at a merchantable size in a shorter time and at a younger age than did the trees of the original stand.

The actual relation of age to diameter is of very little consequence to the lumberman. He cares absolutely nothing whether the spruce tree that he cuts is 100 or 180 years old, provided that it is of size and condition fit for cutting and marketing. Nor does he regard it as important that the trees now present in the near unmerchantable portion of the stand are 30 or 100 years old. His particular interest is the time that will be required by the trees left after cutting to grow from one diameter class to the next, and especially through the inch classes now unmerchantable into dimen-

sions that are of merchantable and market size.

In conclusion, the foregoing has been based on and illustrated by studies made on the Adirondack Spruce, but it is believed that it is applicable to Eastern Spruce and Balsam wherever grown.

SUMMARY

1. Growth under a heavy crown cover in virgin forest is not to be accepted as part of the productive forest, and cannot be used as a measure of future possibilities.

2. The effect of the removal of the overtopping trees is an increase in the growth of the surviving suppressed material.

3. This effect is not immediate but follows a period of readjustment, the length of which is dependent upon the crown and root development of the individual tree.

Trees And Western Crop Increase

(FROM REGINA LEADER)

The present time, when so many Westerners are suffering from crop failure, seems opportune for consideration of the question of tree planting.

Some time ago, Dr. W. W. Andrews of Regina, suggested the planting of each road in the province with a double row of trees on each side, the inner row to consist of ash and elm, intermixed with more rapidly growing trees for almost immediate protection, which could be removed as soon as the others became of sufficient size, while the outer row, set 100 feet back from the road on either side should consist of caraganas, etc., which would form a good hedge, and so prevent snowdrifts in winter. A scheme of this kind, carried out throughout the province, would not only protect the roads, thus making travelling in winter much easier, owing to the absence of deep snow drifts, but it would have what is perhaps an even more import-

tant effect. It is a fact, unfortunately too well-known to the farmers of the province, that the crop in certain parts has this year proved a lamentable failure. It is equally well-known known that the crop in the northern of the province is at least an average size, and the question naturally arises as to what is the explanation. There may be several reasons for this, but one factor which may easily be overlooked is the presence or absence of trees, and this is a

(Continued on page 1850)

A NATIONAL WARNING.

Canada will pay her war debt from Lands, Forests and Mines. The Fire Fiend, who is the Kaiser's ally, is scheming to finish the forests first. He can't kill the Land or Mines, but the Forest is his natural prey.

Are you aiding this Fire Fiend by leaving your camp fire burning?

Piegan Pines

By Walter Prichard Eaton

I shall be one with these pines
Some happy day.
Dwarfed by the wind and molded by
the snow,
They burst pink cones
In a meadow starred with violets.
No sound they hear
But the mountain wind,
The birdlike chirp of the ground
squirrels,
The tinkle of ice-water brooks
Across the grass,
The far, soft thunder of outleaping
streams
That glide like silver hair down drip-
ping cliffs

From glaciers on the Great Divide—
The hair of *Melisande* grown white
with peace.
All night I lay beneath the stars
And heard their breeze-borne thunder
I saw the sun
Blush on the glaciers while the world
was dark,
Then pry the gloom out of the hole
beneath;
I saw the golden violets
Nod in the rising breeze;
I drank from brooks of melting snow.
And said good-morning to a deer.
I shall be one with these pines
Some happy day.

The Old Trees and the Young

By Helen Foley

The forest leaves had turned to russet
brown,
And the small cedars and the stump
firs
Watched horrified,
And called to the oaks, moss-grown
“How long is't ere the spring and
summer dim?”
The old trees shook their heads and,
sighing, cried:
“We are so old we cannot count the
years,
And Time is twisted in our every
limb.”
At night the winds and growing cold
made wars;
Unto the elms whose crested head
each rears
Against the stars,
The little birches sighed:

“Where is the sun, the birds that
sang to him?”
The old trees shook their heads and,
wailing, cried:
“We are so old we cannot count the
years,
And Age is twisted in our every limb.”
At last the young trees quiet grew,
outworn,
And all the forest shed its silent tears;
Autumn's last warm day died.
Naked, forlorn,
The aspens shivered in the winter
grim:
And the old trees bent their heads
and, moaning, cried:
“We are so old we cannot count the
years,
And Death is twisted in our every
limb.”

Germany doubled its Yield in a Generation.

Germany has for long spent 7,000,000 pounds sterling a year on its forests (or about 3,500,000 pounds sterling if we deduct the timber working), and it has got the yield doubled in a generation.

Hooverizing Tree Materials in England

How waste is cut to an almost irreducible minimum in the operations of the Canadian Forestry Corps in Great Britain and France is shown in the following report on the work of the corps received from overseas.

Every native Canadian of mature years has, in youth and after, observed the timber operations which form a striking part of the industrial life of Canada.

Everyone knows how the slabs were used for firewood and the sawdust scattered regardless over acres and acres of ground. With this knowledge to work on, one is in a position to intelligently appreciate the splendid work being done by the Canadian Forestry Corps in Great Britain and France. Economy and efficiency are characteristic of the Forestry Corps in a far greater measure than is generally realized in Canada. We are in the midst of the greatest war of all time. Working under the necessity of turning out huge quantities of material it might reasonably be expected that economy would go by the board in the hurried rush for production. This has not been the case. In spite of the imperative necessity for speed, the Canadian Forestry Corps are conserving material in a manner only practiced by the most modern peace-time mills in Canada.

Use Even the Bark.

In these military operations slabs are being cut into lumber until practically only the bark remains, and where practicable that is being used for tanning and in the production of wood alcohol used in manufacturing explosives. Short pieces and narrow pieces are sent to box factories to be made into boxes for munitions of war. The sawdust is the only fuel used to raise steam which provides power for driving machinery of the mill; the residue is used instead of straw for bedding

horses. In fact, as already stated, all that remains of the original log is the bark, and it is seen that where feasible, even that is not wasted.

Men at Base Employed

With reference to the conservation and use of man-power, the same considerations hold good. A very good illustration of economy in timber, working in close relation with economy in man-power, is found at the Base Depot, Sunningdale. Here, timber which has passed maturity and has commenced to deteriorate, both as to beauty and utility, is being thinned out of the royal forest. This timber is saved by men who would otherwise be temporarily unemployed. For the base depot is a clearing house for the personnel of the corps. On arrival from Canada, men are held at the base depot, in quarantine, for two or more weeks. It is sometimes necessary to keep them for a longer period to complete their training. Men transferring from a unit which has completed its operations on one area, are sometimes held at the base depot for a short period. In various circumstances men are temporarily unemployed awaiting despatch to their units. These men are kept usefully employed.

Need Expert Surplus

Every employer of labor understands the necessity of keeping certain surplus labor to provide against the stoppage of machinery through exigences of operation. In private business the labor exchanges keep surplus labor tabulated so that requirements can be met and vacancies filled with the minimum loss of time. The base depot does this for the Forestry Corps. The fact that the men are mostly highly qualified experts, who can only be secured in Canada, which is 3,000 miles distant, makes the necessity of this arrangement obvious.

Base in Windsor Park.

The Forestry Corps established its base depot in the Royal Park at Windsor at the express invitation of His Majesty, King George the Fifth. The mill was set up at His Majesty's request and the trees to be cut down are designated by him.

The lumber secured is being used for building portable huts which are built in standardized sections. They can be easily transported and quickly erected. Four complete huts are

turned out per day. There are also machines for making handles for technical tools used in the corps, such as axe-handles, cant-hook handles, etc.

The Canadian base depot is the only base depot where men who are awaiting further training or orders to report elsewhere, are occupied in constructive labor. What is most important is the fact that the base depot is typical of the corps.

"Petit Catechisme De la Foret"

Above is the title of a new sixteen page illustrated booklet which the Forestry Association is issuing for free distribution to French speaking children. The first edition will consist of 10,000 copies and will be followed by further editions.

An English edition will also be issued and given wide distribution.

The object of this booklet is to instruct the child of twelve to twenty years in some of the rudimentary points of forest protection. The adult reader has not been especially considered.

Following are some of the Questions for the Ontario booklet which are answered in the simplest form:

- Who owns the Forests of Ontario?
- What is the 'Government'?
- Who are the Limit Holders?
- Which is best, the Forest or the Farm?
- How can I tell good and bad Land apart?
- How big were the Forests in great-grandfather's Day?
- How big are the Forests Today?
- What is a Fire Ranger?
- Can I be a Fire Ranger?
- Tell me the Causes of Forest Fires.
- Do Forest Fires cause much harm?
- Will not Farms come when Forests go?
- How do the Timber Lands make Ontario prosperous?

Forestry Societies in Other Lands

There are several forest societies in France:— "Societe des Amis des Arbres," etc.; there is the "Societe Centrale Forestiere de Belgique," with an extensive membership, and a useful monthly bulletin. There are six forest societies in England. The Danes have a moorland society doing practical work in planting up large areas of moorland. This society has planted something like 150,000 acres of moorland, the society getting a Government grant of some 20,000 pounds sterling yearly, and free transport for the marl and lime used in the moor planting. In the other European States, and in the United States of America, there are numerous forest societies. In Japan there are some 20 forest societies, with a special law, passed in 1907 for their

recognition and governance; every private forest owner is compelled by law to belong to the local forest society of Japan.

BELGIUM'S SMALL FORESTS

Belgium is not one of the forest Countries of Europe. It is only recently that much attention has been given to Forestry: the total area of State-manged forest is only 430,000 acres. Yet Belgian Forestry, now gives winter employment to an average of 32,000 men, and permanent employment throughout the year to 750 men. At the same time it is computed that its forest expenditure is giving a return of between 4 per cent and 5 per cent. This high employment figure is due to the cost of much planting, now required in restoring the forests.

Heavy Losses in B. C. Forest Fires

(From "Pacific Coast Lumberman" Vancouver.)

For over a decade British Columbia has not experienced such a dry season as that of the spring and the early part of the summer of 1918. The last period of Sahara-like weather that touched this province was in 1907, when considerable damage was caused by forest fires, but that season pales into insignificance in comparison with that of the present year of grace. It was the banner year for drought, and has left behind a trail of destruction that has spelt ruin in many instances and that has, for the time being at least, thrown hundreds of men out of employment. With very few exceptions, there has not been a district in the entire province that escaped the flames caused, in some cases, through carelessness, and in others, if the statement of the District Forester is to be accepted—through sheer wantonness.

For weeks and months the woods and undergrowth were as dry as tinder. Only a spark was needed to set the country ablaze and unfortunately this spark was supplied too frequently. The big series of fires which followed has led to a condition of affairs that must be taken serious cognizance of by those who have the power of dealing with such matters with a view to preventing their repetition. Had it not been for the heavy rainfall that started on the evening of July 9, there is not the slightest doubt but that condition would have been infinitely more serious. As it is, they are sufficient so to warrant the taking of measures that should, with strict enforcement, put a period to this indiscriminate destruction of the province's most valuable asset.

Much Damage Done.

It is impossible to give even a rough estimate of the amount of damage done by this series of fires. But it is safe in saying that the total will aggregate anything up to a million dollars. With a few excep-

tions every forest and bush district in B. C. has been partially or wholly devastated by the flames. This applies both to the mainland and the Island. Principal among the losses was that sustained by Bloedel, Welch, and Stewart, whose logging camp was almost completely destroyed, and the Eburne mills, which were entirely gutted.

Since the commencement of the spring and summer season, the series of outbreaks has continued to increase day after day until at the beginning of July the situation was such that the fire warden were unable to cope with it. In other words, there were insufficient and inadequate measures to handle the big task, with the result that an enormous stretch of timber and bush land has been laid waste. To some extent this could have been prevented if old style methods had been abandoned and more up-to-date plans followed that would have enabled the altogether too small band of fire-fighters to have dealt with the work in a more efficient manner.

The statement by District Forester A. C. Van Dusen, whose headquarters are at Vancouver, that there probably was malice in the start of some of these fires is one of which the most serious cognizance should be taken. Mr. Van Dusen stated that "there are some fires at any rate in which the causes are unknown, and it is possible they are being deliberately set." If this is so, then the most drastic measures are not too severe to handle a situation of this character. In support of his contention that incendiarism has played a prominent part in these fires, the fact that there are so many outbreaks simultaneously is significant, and it is a matter for the government to deal with promptly.

Attack Big Camp.

On the morning of July 1 three fires broke out simultaneously at

three different places. One of these was at Grief Point, about a mile and a half from the logging camp of Bloedel, Welch & Stewart, and the other two were slightly east of Powell River. That same night there was a strong breeze blowing, and it was as much as the employees at the camp could do to save the beach camp. But they did. The next morning the flames had reached the main camp, and cut the staff off from access with the other camps. In the afternoon of that day the Powell River outbreak travelling with some speed with the aid of a gale of wind, burned out the Bloedel, Welch & Stewart property in the twinkling of an eye. So rapid was its progress that the men had barely time to escape and some of them had to take to the creek to save their lives.

Some idea may be formed of the destructiveness of the outbreak when it is stated that, despite the fact that the district over which the flames travelled had been twice burned over this year, the fire was one of the fiercest that has been experienced in that locality for many years, Mr. F. C. Riley, manager of this company, told *The Lumberman*. As a result of this fire, which in some places traveled over two miles, the company lost all their camp cars on wheels, including the stock and fixtures, five other cars that were in the camp, three million feet of logs, principally fir, as well as some cedar. The work of reconstruction has, however, been started and tentative arrangements were made in the shape of a tent camp to go ahead about the 25th July, with operations in full swing. Within a few months, it is estimated a larger and better camp will spring up in keeping with the manner in which this firm conduct their business.

Ruin for many.

Apart from the bush fires, there is a long list of fires that in many cases has spelt ruin for sawmill owners, and the residents of the districts affected. Two of the most serious have already been mentioned. To these have to be added this season the McDonald mill at Fanny Bay, the loss at which



A Great Book on Our Wild Animals at a Bargain Price!

In the idle moments of your summer outing there is opportunity for burnishing up your half-forgotten knowledge of our Canadian wild animals and for learning a hundred things you never suspected before.

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

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

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

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

Enclose a dollar bill to the Canadian Forestry Journal, 206 Booth Building, Ottawa, marking your name very plainly on the attached coupon:

.....
Canadian Forestry Journal, Ottawa.

Please send copy of 'The Animal Guide' in leather binding to the following address. One dollar is enclosed.

Name.....

Address.....

was in the neighborhood of \$620,000; the Pearson Mill at Barnet, where the destruction wrought was something like \$10,000. The Yarrow mills increased the amount by another \$12,000, and the Apex mills at Cloverdale by \$5,000.

Several thousand cords of shingle bolts were destroyed at the Campbell River Lumber Company's plant at Hall's Prairie and Pine Grove. Two thousand acres of lightly wooded country were swept in Columbia Valley in Cultus Lake district, flames in this region sweeping right across the international boundary. Between Powell River Townsite, and Powell Lake, one of the most serious fires raged for several days, threatening the mills of the Powell Lake Lumber Company and the Brooks-Bidlake Cedar Company. Here the obstacles in the path of the fire-wardens were of an almost insurmountable nature, but despite these, good work was done with the means at their disposal. The International Timber Company's No. 4 camp at Campbell River was attacked with the result that five valuable logging engines were ruined and others had a narrow escape. It is estimated that the damage done there was approximately \$75,000. As before stated, there is scarcely a region in the whole of the province, with the exception of Kamloops, Cranbrook, where rain fell, and Nelson, but has been the victim of the flames. And this applies also to Vancouver Island.

On the latter Courtenay was one of the greatest sufferers. No less than three outbreaks were raging at one and the same time. Camp 2 of the Comox Logging and Railway Company went up in flames and smoke, the Westholme Lumber Company's plant likewise suffered, a million feet of standing timber was razed near Courtenay, and the greatest difficulty was experienced in saving Mr. Berkeley Grieve's mill.

These are only a few of the most serious conflagrations during the season, in which the month of June contributed the greatest part. As a matter of fact, according to official

statements, June of 1918 has established a record which could not be equalled again in this respect.

One of the strong chains between public sentiment in British Columbia and the forest conservation cause is the need for the regulation of stream flow, upon which so much of the fertility of the province depends. Deforestation has greatly aggravated conditions in the Kootenay Valley on the watershed of which about thirty per cent of the forest cover has been burned off. Reproduction, however, is most promising and is beginning already to act as a protective factor.

An interesting investigation is being developed by the Government of British Columbia for the reclamation of many thousands of acres of valuable lands now flooded each summer by the waters of Kootenay Lake. The soil thus rendered useless is capable of growing excellent crops.

P. L. BUTTRICK

CONSULTING FORESTER

NEW HAVEN, CONN., U. S. A.

P. O. BOX 607

TIMBER ESTIMATES

UTILIZATION STUDIES

PLANTING PLANS

Landscape and General Forestry
Work.

Eight years experience in practical
forestry work of all sorts.



Dry Matches

After all day in a boat, rainstorm or wet snow. Ask your dealer for

MARBLE'S WATERPROOF MATCH BOX

If he can't supply you, we will send prepaid for his name and 50 cents. Dry matches may save your life!

MARBLE ARMS MFG. Co.
Dept. 5160 Gladstone, Mich., U.S.A.

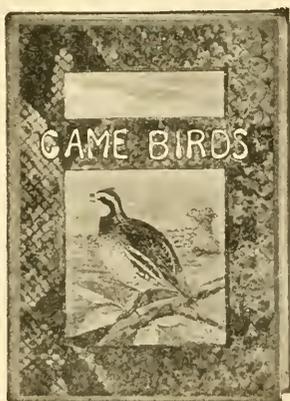
KNOW THE GAME BIRDS

Great Fun as well as Great Instruction if you possess a copy of "Game Birds."

Are you able, off-hand, to describe twenty-one kinds of ducks and six kinds of geese? Probably not!

Here is an opportunity that will not come your way again. The Forestry Journal has four hundred copies of "Game Birds," which it is able to dispose of at

FIFTY CENTS A COPY
THREE COPIES FOR \$1.00, POSTPAID



A splendid little book of 64 pages, 5 x 7 inches, made up of heavy coated paper throughout.

Forty-nine of the best illustrations in life-like natural colors you ever saw—really a beautiful piece of quadri-color printing. Decorated board covers.

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

CANADIAN FORESTRY JOURNAL

206-207 Booth Building, Ottawa.

B. C.'s Timber Stock Imperilled

To criticisms of the Forest Service by some British Columbia lumbermen who claimed that the facilities for fire protection were inadequate, Mr. P. Z. Caverhill, acting District Forester at Vancouver, retorted that British Columbia "has the most efficient forest protection service in the whole of the Dominion." In an interview in the Pacific Coast Lumberman, Mr. Caverhill made the following statements:

Peril to Coast Timber.

"There is no question that the probable increase in the demand for lumber after the war is going to make serious and heavy inroads on our supplies, and for that reason I think this is a matter that should be taken into the most serious consideration by everyone concerned. This as you are aware, is the most destructive season from a fire standpoint that we have experienced in British Columbia for many years. Another few seasons like this, and it will mean that B.C.'s. greatest asset in the shape of timber would be greatly imperilled. But, with the means at our disposal and the effective steps we have taken to cope with the trouble, I do not think there is much danger of any further serious outbreak, at least this year. It is best, however, to be prepared, and with that idea in view, we are not neglecting any measures that we think will assist us in handling the situation should it arise."

"It has always been a debatable point," remarked the "Lumberman," "not only among the members of the trade, but also among the people of this province, not to say Canada, how long the cutting of the finest timber in B.C. can be carried on without there being any fear of a shortage." Mr. Caverhill's statement to "The Lumberman should set at rest all doubts that may exist on this subject. Some few years ago a survey was made of the timber limits in British Columbia by officials of the Dominion government. Their

report to Ottawa stated that at that time there was 400,000,000,000 feet of merchantable timber in B.C. and that, said Mr. Caverhill, was altogether exclusive of the young timber.

Annual Rate of Cutting.

"Now if you consider that at the utmost, we are cutting at the rate of from a billion and a half to a billion and three-quarters annually, you will easily see the tremendous reserves we have before we touch the last tree trunk in this coast province. Even with the abnormally heavy logging that is being done at the present time in view of the demand for aeroplane spruce and other timbers for war purposes, the supply of timber in British Columbia is practically inexhaustible. So that I may say, we have a supply in sight that will last for over two hundred years more.

"And besides that," he continued, "there is the abnormal increment which is at the rate of about 6,000,000,000 feet every twelve months. This is entirely separate from the young trees and also distinct from the timber that is considered now to be inaccessible but which in the next century or even less, with improved methods of transportation, will be easily accessible. There is, therefore, not the slightest cause for anxiety on that score. I wish, however, at the same time to impress on everyone the necessity that there is for conservation in every shape and form. Naturally this comes mostly under the head of fire protection, and it is noticeable that while we have had so many serious fires this season, there is a disposition on the part of the campers and loggers and everyone whose business takes them to the woods, to more rigidly observe the laws that have been laid down."

The total initial cost of the new Forest Producers Laboratories at Vancouver, will be \$20,000, of which the Dominion government will contribute \$15,500, and the Provincial Government the balance.

Useful Forestry Books

FERGUSON—FARM FORESTRY

By John Arden Ferguson, A.M., M.F., Professor of Forestry at the Pennsylvania State College. VIIIx211 pages. 5¼ by 8. Many full-page half tones. Cloth, \$1.25 net.

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

KINNEY—THE DEVELOPMENT OF FOREST LAW IN AMERICA

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

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

KINNEY—THE ESSENTIALS OF AMERICAN TIMBER LAW

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

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

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

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

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

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

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

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

TAYLOR—HANDBOOK FOR RANGERS AND WOODSMEN

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

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

THE UNIVERSITY OF TORONTO

AND

UNIVERSITY COLLEGE

WITH WHICH ARE FEDERATED

VICTORIA, TRINITY, ST. MICHAEL'S
KNOX and WYCLIFFE
COLLEGES

FACULTIES OF

ARTS

APPLIED SCIENCE

MEDICINE

EDUCATION

HOUSEHOLD SCIENCE

FORESTRY

For further information, apply to the Registrar of the University,
or to the Secretaries of the respective Faculties.

(Continued from Page 1840)

factor in which we believe the north has the advantage. The matter therefore stands thus: the southern part of the province has few trees and a light harvest, the northern portion more trees and a heavier harvest. If then we are right in drawing conclusions from this it would certainly be a good investment to carry out the suggestion of Dr. Andrews to plant every road in the province with trees.

During the present summer, large numbers of farmers have lost their crops through the drifting of the soil, due to want of protection from the winds. These dry up the moisture and uncover the roots of the crops, which then are in danger of being burned up by the rays of the sun. On the other hand, trees attract moisture and protect the fields, and may therefore have an enormous effect in a dry summer such as the present. If the land is protected by trees it will warm up earlier in the

day, and will stay warm longer at nights and the moisture in the soils would not, as now, be blown miles away. The trees would also protect the fields from snow in winter, and would thus facilitate spring plowing by enabling farmers to get earlier on the land.

From an aesthetic point of view, the matter is of the utmost importance. One of the first things that strikes a person out from the old land is the bareness of the prairies. What an enormous effect it would have on the appearance of the country if well planted, and how grateful would be the protection from the rays of the sun.

It has to be confessed that a vast number of our people look more on the material side than on the aesthetic, and to these the prospect of better crops will surely appeal. From whatever side we may view the question, however, the planting of trees must be an immense advantage.

**CONFEDERATION
LIFE
ASSOCIATION
UNCONDITIONAL
ACCUMULATION
POLICIES**

Are liberal up-to-date contracts which guarantee to the insured every benefit consistent with safety.

Write for Particulars

which will gladly be furnished by any representative of the company or the

HEAD OFFICE, TORONTO



**QUEEN'S
UNIVERSITY**

KINGSTON
ONTARIO

**ARTS MEDICINE
EDUCATION
APPLIED SCIENCE**

Mining, Chemical, Civil, Mechanical and
Electrical Engineering.

HOME STUDY

Arts Course by correspondence. Degree with
one year's attendance.

Summer School Navigation School
July and August. December to April.

GEO. Y. CHOWN,
Registrar.

MINIATURE CONSTRUCTION

Landscape, Mechanical and Architectural Models, Topographical Maps and Paintings. for

SCHOOLS — COLLEGES — MUSEUMS
Government work a specialty

**MORGAN BROS. CO., Inc.
MODEL MAKERS**

Room 1650 Grand Central Terminal
Phone 7720 Murray Hill

NEW YORK CITY

**UNIVERSITY OF
NEW BRUNSWICK**

FREDERICTON, N.B.

DEPARTMENT OF FORESTRY
Established in 1908

Best of facilities for definite instruction and supervision in Practical Forestry.

Surveying, cruising and construction work carried on in our own tract of 3600 acres, with Forestry Camp in the centre.

Competent men from the School at present in demand to take up Forest Survey work with the Provincial Crown Land Department.

For further information address :

DEPARTMENT OF FORESTRY

University Calendar furnished on application.

C. C. JONES, Chancellor.

R. O. SWEZEY

(B. Sc., M. Can. Soc. C.E.)

CONSULTING ENGINEER.

Water Powers. Timber Lands.
Financing Forest Industries.

164 St. James St. MONTREAL.

CORRECTION.

Under the heading of "Forest Legislation in Canada" in the July issue of the Canadian Forestry Journal, a reference was made to the increase of ground rent for Quebec Limit holders from "five dollars per acre to six dollars and fifty cents." Obviously, this ought to have been printed "per square mile."

It is computed that there are 70 million sleepers in use on the railways of Canada, of which 10 millions must be replaced annually. By creosoting it is estimated that a saving would be effected of five million sleepers per annum, equal to 350 millions of board feet of timber, as measured in the round log.

50^{CTS.}

WAR TIME SPECIAL OFFER

ONE WHOLE YEAR

FOR FIFTY CENTS!

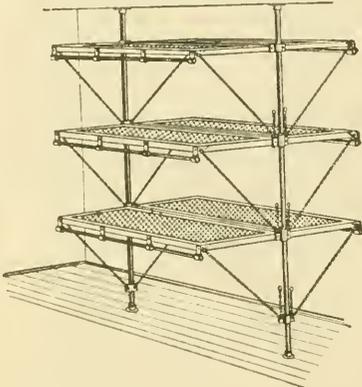
We are desirous of adding 1,000 new names to our list this month and to make it a certainty that we will not be disappointed we are offering

ROD AND GUN

IN CANADA

to you and 999 others for Twelve Months for 50 cents.

W. J. TAYLOR LIMITED, Publisher - Woodstock, Ont.



STEEL BUNKS FOR CAMPS

Included in the well-known line of DENNISTEEL factory, hospital, camp and ship equipment is the all-steel sanitary bunk illustrated. Take up very little room, are comfortable, hygienic and practically indestructible—a permanent investment. Write for particulars and folders on any of the following lines:

Steel Lockers, Bins, Cabinets, Chairs, Stools, Etc.
Standardized Steel Shelving (knock-down system).
Steel Hospital Equipment. General Builders' Iron-work.
Ornamental Bronze, Iron and Wirework.
Wirework of every description.

**THE DENNIS WIRE AND IRON
WORKS CO. LIMITED**

**LONDON
CANADA.**

Halifax

Montreal
Winnipeg

Ottawa

Toronto
Vancouver

TREES, SHRUBS AND SEEDS

Hardy Northern Trees and Shrubs at Lowest Prices. Native and Foreign Tree Seeds

EDYE-DE-HURST & SON, DENNYHURST

DRYDEN, ONT. Shippers to H. M. Government, Etc. Correspondence Francaise.

Hill's Seedlings and Transplants

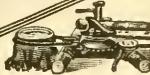
ALSO Tree Seeds for Reforesting. Best for over half a century. Immense stock of leading hardy sorts at low prices. Write for price list and mention this magazine.

Forest Planters Guide Free.

The D. Hill Nursery Co., Evergreen Specialists
Largest Growers in America.
Box 503 Dundee, Ill., U.S.A.

Try This Stump Puller at Our Risk

The Smith Stump Puller will take out every tree and stump by the roots, clearing from one to three acres a day, doing the work of twenty men. We want you to send for our 3 year guarantee against breakage and our free trial proposition. Address W. Smith Grabber Co. 11 Smith Sta. LaCrescent, Minn.



Gaynon & Morissette

Lumber Contractors
Timberland Cruisers
Forest Industries

CHICOUTIMI, P. Q.

LT.-COL. L. J. D. MARQUIS

Forest Engineer and Mem. Can. Soc. of F.E.;
Quebec Assoc. of F.E.; Former Mem. Que. F. Service

Forest Cruising and Mapping
Timber Factors and Logging Costs
Facts on Forest Growth and Future Products

90 LOCKWELL AVENUE, - - QUEBEC

R. R. BRADLEY

Forest Engineer and Mem. Can. Soc. of F. E.
Consulting Forester to the New Brunswick Railway Co.

Timber and Pulpwood Estimates. Forest Maps. Advice on the Management of Wood Lands. Timber lands listed for sale.

GLOBE ATLANTIC BUILDING, ST. JOHN, N.B.

Or P. O. Box No. 5, OTTAWA, Ont.

YALE UNIVERSITY FOREST SCHOOL

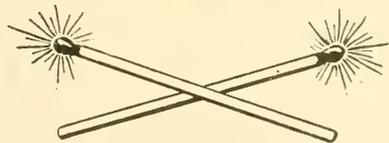
NEW HAVEN, CONNECTICUT, U.S.A.

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

For further information address

JAMES W. TOUMEY, Director
New Haven - Connecticut

ASK FOR



PHILLIP T. COOLIDGE FORESTER

Timber Estimating and Mapping.
Supervision of Lumber Contracts.
Surveying. - - Forest Planting.

STETSON BLDG., 31 CENTRAL ST.
BANGOR, MAINE.

**A B C DIRECTORY AND YEAR
BOOK OF LUMBER TRADE
OF B. C. CLOTH. 136 PP**

*Progress Publishing Co., Ltd., Van-
couver—\$2.00*

The 1918 Edition of the "A. B. C. Lumber Trade Directory of British Columbia," just off the press, is a valuable addition to the desk of the business man.

The directory section of the book contains an alphabetical list of every lumber and shingle mill in British Columbia with details of the management, capital, date of establishment, products, and capacity of the plant; a classified list of firms manufacturing various commodities in the lumber industry; an up-to-date list of the logging operators throughout the province; lists of timber cruisers, log brokers, lumber wholesalers, towing companies, and similar information.

A second section of the book, of particular interest to the lumber industry, gives details of the customs tariffs of various countries.

Another section gives the full text of all the legislation dealing with the lumber industry in British Columbia.

Another section gives a mass of technical and statistical information regarding the various woods of B.C. showing their strength, values, volume tables, and other information of that nature.

There is also a complete table showing the fees and royalties payable for the various licenses and leases, and information regarding timber marks and log marks.

A useful Buyers' Guide is included in the book, being a directory of mill and camp supply houses which should prove of use to lumbermen.

Every day that we Canadians tolerate wanton destruction of our natural resources, we tolerate a form of internal mischief that plays directly into the hands of the enemy.

Rabbits as a Business.

Rabbit growing enterprises are reported from various parts of the country, the animals being raised both for fur and meat.

A California company is to establish a large fur-rabbit farm and pack the meat as tin potted here.

Business men of Hamilton, Canada, have taken over a fur-rabbit farm and will raise Siberian rabbits for fur and meat. This latter species is said to be comparatively new to Canada. It sometimes reaches a weight of 14 pounds is black in color, grows very quickly and one doe will produce about 100 young in eight months. The meat can be produced at 5 cents a pound, it is said, and the pelts are of very good quality for rabbit fur.

Uncle Sam is looking into the wild Western jackrabbit, which is killed by millions every year as a pest by farmers. It is maintained by the Department of Agriculture that jack-rabbit meat is good game when fresh and that the hams, when corned and smoked, will compare well with German goose hams.

The Paper For People Who Would Really Know

Those who are reading WORLD WIDE week by week are finding themselves better informed as to the thought and doings of these momentous times than those who merely depend on the Daily press; for in WORLD WIDE is presented the well considered thought of those who concern themselves with the inner meaning of things rather than with their passing appearance. In WORLD WIDE you will find assembled just a few of the really noteworthy articles of the week, selected from the most responsible British and American journals and reviews—care being taken to have different points of view represented. Many of these articles have been written or inspired by the great men of the times. Sample copies FREE; or for five weeks trial for ten cents in stamps, or fifty cents on trial to end of 1918 to new Subscribers. (Regular subscription rates \$2.00.) JOHN DOUGALL & SON, Publishers, Montreal.

An Open Letter to Members!

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

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

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

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

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

And hundreds haven't.

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



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

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

Canadian Forestry Association

Booth Building, Ottawa.

Not affiliated with any government or commercial interest.



How About Operators ?

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

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

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

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

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

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

Cutting & Washington, Inc.

1083 Little Building - BOSTON, Mass.



Canadian Forestry Journal

Vol. XIII

SEPTEMBER, 1918

1757

No. 9



A FOREST ROAD NEAR MOUNT BENSON, BRITISH COLUMBIA

TENTS IN EVERY STYLE

May be had made up of
the celebrated



Write for Samples and Prices.

The Woods Manufacturing Co., Ltd.

FORMERLY SMART-WOODS, LTD.

OTTAWA - TORONTO - MONTREAL - WINNIPEG

FOREST TELEPHONES



Make the life of the forester better worth living. They relieve him from the appalling loneliness. They help him to keep in human voice touch with foresters miles away.

In emergencies—fire—sickness—hunger—the speed with which they can summon help is marvellous.

Write for full particulars of how to install the Northern Electric Forest Telephone System. Address the Office nearest you.

Northern Electric Company
LIMITED

Montreal
Halifax
Ottawa

Toronto
London
Winnipeg

Regina
Calgary
Vancouver

Northern · Electric · Forest · Telephones ·

Canadian Forestry Journal

CIRCULATION 6800 COPIES MONTHLY

ROBSON BLACK, Editor.

Vol. XIV.

WOODSTOCK ONT., SEPTEMBER, 1918

No. 9

CONTENTS FOR SEPTEMBER

- “Planting the Home Grounds”
By E. B. Luke, Montreal.
- “Growing a New Forest Family at St. Jovite”
By A. C. Volkmar, Forester, Riordon Pulp and Paper Co
- “A Small Town in the Wood Business”
By the Fuel Controller of Perth, Ontario.
- “War’s Terrible Drain on Europe’s Forests.”
- “Canada to Profit by Forestry Corps’ Experience”
- “Official Estimate of B.C. Timber Losses this Year.”
- “Canada and the Idea of Science”
- “Stock Taking of Canada’s Timber”
- “The Race for Aeroplane Spruce”
- “Proper safeguards in Tree Planting”
- “Canadians beat All-Comers in Aerodrome Work”
- “\$4,000,000 Yearly for Forest Upkeep”
- “Golden returns from Forest Maintenance”
- “Why Forests pay Better than Mines”
- “Australia demands Trained Foresters”
- “Wireless Telephone for Forest Patrol”
- “N.B. Chooses Rangers on Merit Basis”
- “Ways of Research and Crickets”
- “Fire Pump Withstands Tests”
- “Exaggeration of Canada’s wood Supply”
- “The French Forest Service”
- “Jail for Endangering Forests”
- “3000 Million Seedlings to Replace British Forests”
- “Eastern Forests Producing Poorer Wood”
- “How France’s Forests Increase Population”

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

Address all Communications to

THE CANADIAN FORESTRY JOURNAL

206-207 BOOTH BUILDING, OTTAWA

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

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

Growing a New Forest Family at St. Jovite

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

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

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

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

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

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

Watering System.

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

Shade Frames

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

Winter Protection.

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



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

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

The Seeding Process.

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

Care of Seed beds

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

during sunny days, or heavy downpours of rain, and uncovered on dull days or during ordinary rains.

Transplanting

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

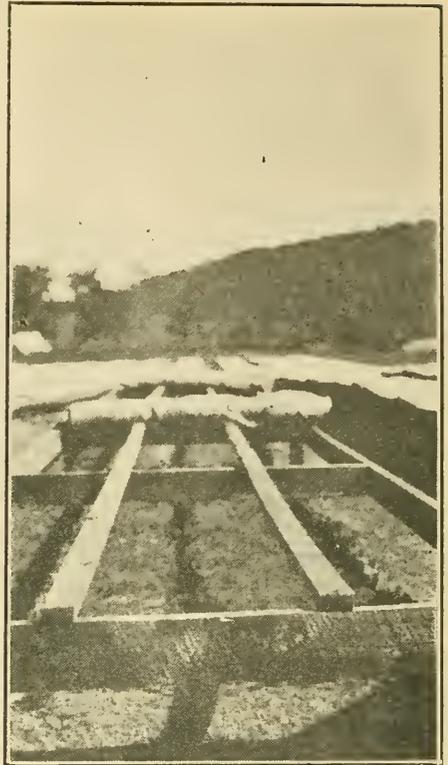
The care the transplants will receive will be confined to cultivation and watering in case of severe drought only. Two complete sets of transplant areas will be used, allowing one to lie fallow each year, in order to build up the soil value.

Digging out and Shipping

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

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

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



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

Exaggeration of Canada's Wood Supply

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

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

PLANTING ON THE PRAIRIES

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

Planting the Home Grounds

By E. B. Luke, Montreal.

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

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

Fared as a "Luxury"

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

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

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

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

Organized Beauty

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

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

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

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

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

The use of Shrubs.

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

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

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

Plan the Grounds.

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

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

The Race for Aeroplane Spruce

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

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

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

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

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

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

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

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

Fire Pump Withstands Severe Test



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

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

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

A Small Town in the Wood Business

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

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

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

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

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

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

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

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

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

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

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

BUSH FIRES KILL HONEY CROP

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

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



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

Official Estimate B. C. Timber Losses

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

Victoria, B.C., Aug. 11: The Forest Fire Season for 1918 has been, to date, one of rather moderate fire risks, with three weeks of extremely hot dry weather, which created the worst fire risk since 1910, breaking into the season during the latter part of June and first week in July. This was attended, in the Coast and Island District, with several severe outbreaks of forest fires, so that during one week alone there was destroyed a large quantity of logging machinery, camps, equipment and logs. Several thousand acres were burned over during this time of stress, which was followed by a 24 hour rain that eased conditions, and allowed the fire fighters to assume control of a somewhat serious situation.

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

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

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

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

WOOD FOR ONTARIO'S USE.

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

WASTING THE VALUES.

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

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

Crowds Visit C. F. A. Exhibition Car

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

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

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

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

given. Following are typical records of attendance.

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

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

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

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

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

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

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

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

STATE OWNERSHIP GAINING

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

3000 Million Seedlings to Replace British Forests

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

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

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

Ways of Research and Crickets

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

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

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

N.B. BUILDING TOWERS.

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

War's Terrible Drain on Europe's Forests

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

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

Drained of Timber.

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

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

The situation in France is about as follows:

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

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

Every Tree Paid For.

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

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

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

Our Part in Restoration.

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

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

How France's Forests Have Increased Population

By Gilbert Brown, Royal Scottish Arboricultural Society.

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

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

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

N. B. Changes Plan of Selling Timber

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

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

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

N. B. Chooses Rangers on Merit Basis

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

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

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

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

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

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

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

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

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

A Proper Safeguard in Tree Planting

By the Editor of the "National Nurseryman."

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

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

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

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

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

Stock-taking of Canada's Timber

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

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

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

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

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

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

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

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

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

Canada and the "Idea of Science"

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

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

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

PULP AND PAPER ON TOP.

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

A County that Values its Woodlands

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

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

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

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

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

Canada to Profit by Forestry Corps' Experience

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

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

Wireless Telephone for Forest Patrol

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

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

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

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

Why Forests Pay Better Than Mines

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

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

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

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

Australia Demands Trained Foresters

(*Australian Forestry Journal.*)

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

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

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

that a forest worker—of high or low degree—should be able to distinguish between a hardwood and a soft-

wood tree and tell the peculiarities of each. He must be a man of attainments in forest science.

B. C. Air Patrol Scheme Not Abandoned

(*Vancouver Province.*)

FLYING BOAT MEETS MISHAP.

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

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

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

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

Government Leased Machine.

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

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

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

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

Prospecting From Aloft.

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

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

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

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

BY-PRODUCTS AND VELVET

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

WHY DOES SAWDUST SINK?

From American Lumberman

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

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

From Saint John West, N.B.

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

Tuning Up the Forest Yield

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

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

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

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

\$20 PROFIT ON SEASON'S CUT.

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

FIRE ENDANGERS LIVES

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

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

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

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

Golden Returns from Forest Maintenance

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

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

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

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

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

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

STUDIES IN PULP FORESTS.

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

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

The French Forest Service

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

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

Director of Forestry Seriously Injured

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

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

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

BORERS IN SPRUCE.

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

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

\$4,000,000 Yearly for Forest Upkeep

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

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

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

Eastern Forests Producing Poorer Wood

By Ellwood Wilson in "American Forestry."

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

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

Jail for Endangering Forests

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

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

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

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

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

“The Child’s Book of the Forests”

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

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

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

Who Owns the Forests of Ontario?

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

What is The Government?

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

Who are the “Limit Holders?”

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

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

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

Which is best, a Forest or a Farm?

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

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

But how can I tell these lands apart?

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

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

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

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

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

How big are the Forests today?

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

What is a Fire Ranger?

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

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

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

Can I be a Fire Ranger?

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

Do the Fire Rangers protect People as well as Trees?

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

Tell me what causes Forest Fires?

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

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

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

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

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

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

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

Do Forest Fires cause much Harm?

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

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

Will not Farms come when the Forests go?

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

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

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

How do the timberlands make Ontario prosperous?

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

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

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

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

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

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

CANADA CLAIMS SHIP RECORD

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

OVERSEAS SAWMILL RECORDS.

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

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

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



TAKKAKAW FALLS, B. C.

A Forward Move in Nova Scotia!

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

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

Most of Forests in Private Ownership

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

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

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

A Campaign of Education Started

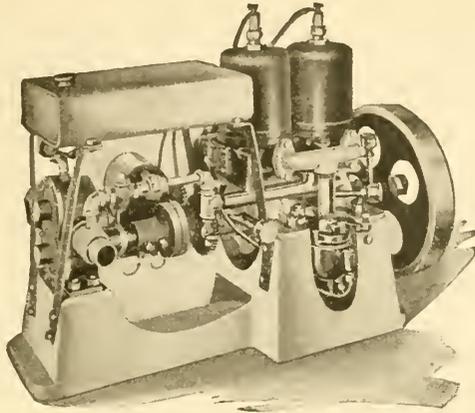
The Canadian Forestry Association, during the past month (and continuing through the months of October and November) has been directing a campaign of popular education in Nova Scotia so as to apprise thousands of citizens of the imperative need of a forward movement in forest conservation. The purpose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

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

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

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

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



FAIRBANKS - MORSE FIRE FIGHTING ENGINES

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

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

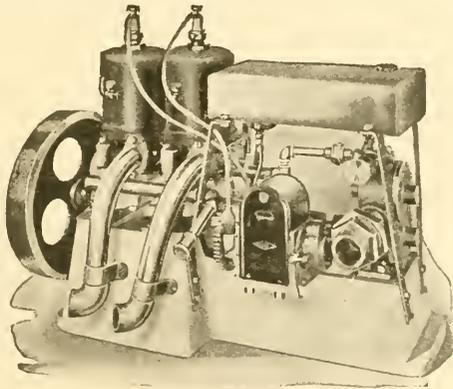
Governments and Private Owners of Forests everywhere, can materially reduce their fire losses by the use of these outfits.

Full information and prices on request.

THE CANADIAN FAIRBANKS - MORSE CO., Limited

MONTREAL - OTTAWA

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



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

Twelve Public Meetings

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

Dr. Fernow's Recommendations

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

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

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

What First Steps are Necessary?

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

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

The Forester's Handling of Crown Lands

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

Nova Scotia Forests Working at Half Capacity

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

"Here is a natural resource, capable, under proper management, of forever producing by annual increment, as interest, at least twice as much as is now being cut from capital stock; a resource which, basing its value on reasonable rates of growth, both of wood and wood values, may reasonably be stated as representing a potential capital of at least \$300,000,000.

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

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

The Call for Immediate Action

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

The brochure closes with the query:

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



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

“My Personal Stake in Forest Protection”

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

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

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

70 PER CENT USELESS FOR FARMS

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

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

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

A FOREST DESTROYER.

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

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

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

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

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

Forest fires imperil the lives of thousands of settlers.

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

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

ARE YOU INCLUDED HERE?

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

P. L. BUTTRICK

CONSULTING FORESTER
NEW HAVEN, CONN., U. S. A.
P. O. BOX 607

TIMBER ESTIMATES
UTILIZATION STUDIES
PLANTING PLANS
Landscape and General Forestry
Work.

Eight years experience in practical
forestry work of all sorts.



Dry Matches

After all day in a boat, rainstorm or wet snow. Ask your dealer for

MARBLES WATERPROOF MATCH BOX

If he can't supply you, we will send prepaid for his name and 50 cents. Dry matches may save your life.

MARBLE ARMS MFG. Co.
Dept. 5160 Gladstone, Mich., U.S.A.

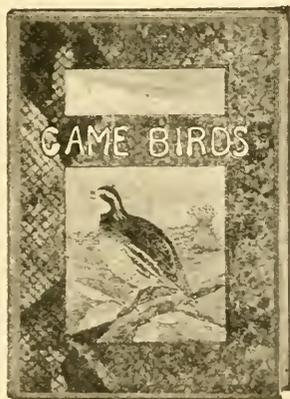
A GREAT BOOK ON GAME BIRDS

Great Fun as well as Great Instruction if you possess a copy of "Game Birds."

Are you able, off-hand, to describe twenty-one kinds of ducks and six kinds of geese? Probably not!

Here is an opportunity that will not come your way again. The Forestry Journal has four hundred copies of "Game Birds," which it is able to dispose of at

FIFTY CENTS A COPY
THREE COPIES FOR \$1.00, POSTPAID



A splendid little book of 64 pages, 5 x 7 inches, made up of heavy coated paper throughout.

Forty-nine of the best illustrations in life-like natural colors you ever saw—really a beautiful piece of quadri-color printing. Decorated board covers.

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

CANADIAN FORESTRY JOURNAL
206-207 Booth Building, Ottawa.

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

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

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

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

WOODEN OVERCOATS NEXT

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

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

Canadians Beat All Comers in Aerodrome Work

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

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

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

\$1,000,000 TO FIGHT FIRES

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

Useful Forestry Books

FERGUSON—FARM FORESTRY

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

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

KINNEY—THE DEVELOPMENT OF FOREST LAW IN AMERICA

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

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

KINNEY—THE ESSENTIALS OF AMERICAN TIMBER LAW

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

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

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

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

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

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

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

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

TAYLOR—HANDBOOK FOR RANGERS AND WOODSMEN

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

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

THE UNIVERSITY OF TORONTO

AND

UNIVERSITY COLLEGE

WITH WHICH ARE FEDERATED

VICTORIA, TRINITY, ST. MICHAEL'S

KNOX and WYCLIFFE

COLLEGES

FACULTIES OF

ARTS

APPLIED SCIENCE

MEDICINE

EDUCATION

HOUSEHOLD SCIENCE

FORESTRY

For further information, apply to the Registrar of the University,
or to the Secretaries of the respective Faculties.

B. C SHIPS CARRY B. C. WOOD

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

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

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

THE AIRPLANE SPRUCE HUNT

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

CONFEDERATION LIFE ASSOCIATION UNCONDITIONAL ACCUMULATION POLICIES

Are liberal up-to-date contracts which guarantee to the insured every benefit consistent with safety.

Write for Particulars

which will gladly be furnished by any representative of the company or the

HEAD OFFICE, TORONTO



QUEEN'S UNIVERSITY

KINGSTON
ONTARIO

ARTS MEDICINE
EDUCATION
APPLIED SCIENCE

Mining, Chemical, Civil, Mechanical and
Electrical Engineering.

HOME STUDY

Arts Course by correspondence. Degree with
one year's attendance.

Summer School Navigation School
July and August. December to April.

GEO. Y. CHOWN,
Registrar.

MINIATURE CONSTRUCTION

Landscape, Mechanical and Architectural Models, Topographical Maps and Paintings. for

SCHOOLS — COLLEGES — MUSEUMS
Government work a specialty

MORGAN BROS. CO., Inc.
MODEL MAKERS

Room 1650 Grand Central Terminal
Phone 7720 Murray Hill

NEW YORK CITY

UNIVERSITY OF NEW BRUNSWICK

FREDERICTON, N.B.

DEPARTMENT OF FORESTRY
Established in 1908

Best of facilities for definite instruction and supervision in Practical Forestry.

Surveying, cruising and construction work carried on in our own tract of 3600 acres, with Forestry Camp in the centre.

Competent men from the School at present in demand to take up Forest Survey work with the Provincial Crown Land Department.

For further information address :

DEPARTMENT OF FORESTRY

University Calendar furnished on application.

C. C. JONES, Chancellor.

R. O. SWEEZEY

(B. Sc., M. Can. Soc. C.E.)

CONSULTING ENGINEER.

Water Powers. Timber Lands.
Financing Forest Industries.

164 St. James St. MONTREAL.

Huge Losses from Logs Sinking

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

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

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

Mr. Charles Dougherty, secretary of the Rideau Lumber Company, Ottawa, showed statements indicating losses from 22.53 to 24.79 per cent. The lower figure applied to spruce logs only. The drive took two years and was about 150 miles. The figures were obtained by taking the difference between the number of logs put into the water and those which reached the mill.

Mr. S. A. Sabbaton, assistant manager of the Laurentide Company, produced a statement covering the years back to 1906. The average yearly loss was nine and two-tenths per cent.

Mr. Alexander MacLaurin, of the

50^{CTS.}

WAR TIME SPECIAL OFFER

ONE WHOLE YEAR FOR FIFTY CENTS!

We are desirous of adding 1,000 new names to our list this month and to make it a certainty that we will not be disappointed we are offering

ROD AND GUN

IN CANADA

to you and 999 others for Twelve Months for 50 cents.

W. J. TAYLOR LIMITED, Publisher - Woodstock, Ont.

TREES, SHRUBS AND SEEDS

Hardy Northern Trees and Shrubs at Lowest Prices. Native and Foreign Tree Seeds

EDYE-DE-HURST & SON, DENNYHURST

DRYDEN, ONT. Shippers to H. M. Government, Etc. Correspondence Francaise.

Hill's Seedlings and Transplants

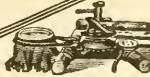
ALSO Tree Seeds for Reforesting. Best for over half a century. Immense stock of leading hardy sorts at low prices. Write for price list and mention this magazine.

Forest Planters Guide Free.

The D. Hill Nursery Co., Evergreen Specialists
Largest Growers in America.
Box 503 Dundee, Ill., U.S.A.

Try This Stump Puller at Our Risk

The Smith Stump Puller will take out every tree and stump by the roots, clearing from one to three acres a day, doing the work of twenty men. We want you to send for our 3 year guarantee against breakage and our free trial proposition. Address
W. Smith Grubber Co.
11 Smith St.
LaCrescent, Minn.



YALE UNIVERSITY FOREST SCHOOL

NEW HAVEN, CONNECTICUT, U.S.A.

YALE University Forest School is a graduate department of Yale University. It is the oldest existing forest school in the United States and exceeds any other in the number of its alumni. A general two-year course leading to the degree of Master of Forestry is offered to graduates of universities, colleges and scientific institutions of high standing, and, under exceptional conditions, to men who have had three years of collegiate training including certain prescribed subjects. Men who are not candidates for the degree may enter the school as special students, for work in any of the subjects offered in the regular course, by submitting evidence that will warrant their taking the work to their own advantage and that of the School. Those who have completed a general course in forestry are admitted for research and advanced work in Dendrology, Silviculture, Forest Management, Forest Technology and Lumbering. The regular two-year course begins the first week in July at the School camp, Milford, Pennsylvania

For further information address

JAMES W. TOUMEY, Director
New Haven - Connecticut

Gagnon & Marissette

Lumber Contractors
Timberland Cruisers
Forest Industries

CHICOUTIMI, P.Q.

LT.-COL. L. J. D. MARQUIS

Forest Engineer and Mem. Can. Soc. of F.E.;
Quebec Assoc. of F.E.; Former Mem. Que. F. Service

Forest Cruising and Mapping
Timber Factors and Logging Costs
Facts on Forest Growth and Future Products

90 LOCKWELL AVENUE, - - QUEBEC

R. R. BRADLEY

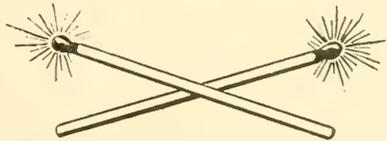
Forest Engineer and Mem. Can. Soc. of F. E.
Consulting Forester to the New Brunswick Railway Co.

Timber and Pulpwood Estimates. Forest Maps. Advice on the Management of Wood Lands. Timber lands listed for sale.

GLOBE ATLANTIC BUILDING, ST. JOHN, N.B.

Or P. O. Box No. 5, OTTAWA, Ont.

ASK FOR



PHILLIP T. COOLIDGE FORESTER

Timber Estimating and Mapping.
Supervision of Lumber Contracts.
Surveying. - - Forest Planting.

STETSON BLDG., 31 CENTRAL ST.
BANGOR, MAINE.

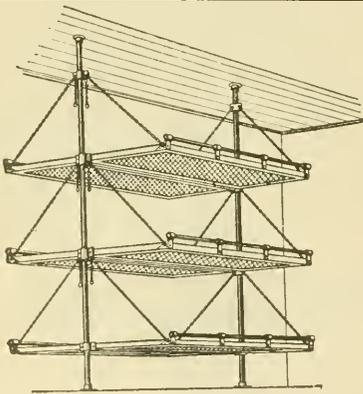
St. Maurice Pulp and Paper Company, gave evidence regarding lumbering on the North River, where sinkage, covering a period of three years amounted to 18.9 per cent. Included in the figures given were 328 cords which were taken from the bottom of the river by a scow. Nine per cent. was written off for sinkage on spruce and from thirty to forty per cent. on balsam. The loss on sawlogs was given at nine per cent. and on four-foot pulp logs sixteen per cent.

An interesting sidelight on the scarcity of woods labor which is hindering lumbering operations this year was shown when counsel announced that one company had paid thirty thousand dollars to employment agencies alone to get men to go into the woods.

N. B. PROSECUTES SETTLERS.

Fredericton. Sept. 5.—A resident of Nashwaak will appear before the Magistrate at Fredericton, N.B., on September 17th to answer to a charge of having set a fire without the necessary fire permit on the 26th of August. As it was a dry windy day, this fire would have done very serious damage to the surrounding forest if twenty-five men had not gathered quickly to extinguish it.

A similar case will be heard in Anderson, Restigouche Co. on the same date, against a settler who, after being personally warned, set fire to his slash without a permit on another dry windy day, and this fire was not extinguished until after five hundred dollars damage was done.



STEEL BUNKS FOR CAMPS

Included in the well-known line of DENNISTEEL factory, hospital, camp and ship equipment is the all-steel sanitary bunk illustrated. Take up very little room, are comfortable, hygienic and practically indestructible—a permanent investment. Write for particulars and folders on any of the following lines:

Steel Lockers, Bins, Cabinets, Chairs, Stools, Etc.
Standardized Steel Shelving (knock-down system).
Steel Hospital Equipment. General Builders' Iron-work.
Ornamental Bronze, Iron and Wirework.
Wirework of every description.

**THE DENNIS WIRE AND IRON
WORKS CO. LIMITED**

LONDON
CANADA.

Halifax Montreal Ottawa Toronto
Winnipeg Vancouver

The Paper For People Who Would Really Know

Those who are reading WORLD WIDE week by week are finding themselves better informed as to the thought and doings of these momentous times than those who merely depend on the Daily press; for in WORLD WIDE is presented the well considered thought of those who concern themselves with the inner meaning of things rather than with their passing appearance. In WORLD WIDE you will find assembled just a few of the really noteworthy articles of the week, selected from the most responsible British and American journals and reviews—care being taken to have different points of view represented. Many of these articles have been written or inspired by the great men of the times. Sample copies FREE; or for five weeks trial for ten cents in stamps, or fifty cents on trial to end of 1918 to new Subscribers. (Regular subscription rates \$2.00.) JOHN DOUGALL & SON, Publishers, Montreal.

An Open Letter to Members!

To take up a gun—
—and get into step—
—and drill and march—

is one way, and a great way, of doing Canada a service.

But when a busy man—
—quietly turns to his neighbor—
—and says: "Join the Forestry Association"

He is doing a patriot's work in direct support of the man with the gun.

Hundreds of our members the last month or so, have gone to a little trouble to recruit a new supporter of the Forest Conservation Movement.

And hundreds haven't.

They have said, "I haven't time," little knowing that the Canadian Forestry Association gets most members from the rushed-to-death executive, the business man whose minutes are worth dollars.



We ask you to score a New Member to your credit today. As a special inducement we will mark his membership and subscription paid up until December 31st, 1919.

BUT, to be a member of the Association means far more than subscription to the Forestry Journal. The latter is an incidental to membership, but we intend to make it a more attractive incidental during the remainder of the year.

Canadian Forestry Association
Booth Building, Ottawa.

Not affiliated with any government or commercial interest.



How About Operators?

Prospective users of wireless usually ask us: "But what about operators? Aren't they hard to get?"

The answer is: "Not if you use C & W apparatus."

The old style sets, with their high voltage, low factor of safety and numerous critical adjustments, could be operated only by an expert, with a specialized training,—and such men are hard to get.

But C & W sets have a voltage of only 200 volts as against from 8,000 to 20,000 volts in the old style sets, a factor of safety of ten as against one and a half, and no critical adjustments. These factors make a set so simple, rugged, reliable and easy to operate that anyone who knows the code can operate C & W sets and keep them in operation—and learning the code is a simple matter taking from four to six weeks. If C & W sets are installed in your forests, your wardens can operate them after a short training.

No C & W set has ever broken down in service; the initial cost of a C & W set is about one quarter that of other sets on the market; the upkeep costs are almost negligible; and you can always get operators for C & W sets among your own men.

May we help you solve your problem?
Details and expert advice from our
engineers upon request.

Cutting & Washington, Inc.

1083 Little Building - BOSTON, Mass.



Canadian Forestry Journal

Vol. XIII

NOVEMBER, 1918

1900

No. 10



SHOWING HOW A BRITISH COLUMBIA SPRUCE LOG IS "RIVED" IN PREPARATION FOR AEROPLANE MANUFACTURE. (PICTURE BY COURTESY "THE LUMBERMAN.")

FACULTY OF FORESTRY

DEC 9 1918

UNIVERSITY OF TORONTO

TENTS IN EVERY STYLE

May be had made up of
the celebrated



Write for Samples and Prices.

The Woods Manufacturing Co., Ltd.

FORMERLY SMART-WOODS, LTD.

OTTAWA - TORONTO - MONTREAL - WINNIPEG

FOREST TELEPHONES



Make the life of the forester better worth living. They relieve him from the appalling loneliness. They help him to keep in human voice touch with foresters miles away.

In emergencies—fire—sickness—hunger—the speed with which they can summon help is marvellous.

Write for full particulars of how to install the Northern Electric Forest Telephone System. Address the Office nearest you.

Northern Electric Company
LIMITED

Montreal	Toronto	Regina
Halifax	London	Calgary
Ottawa	Winnipeg	Vancouver

Northern · Electric · Forest · Telephones ·

Canadian Forestry Journal

CIRCULATION 6800 COPIES MONTHLY

ROBSON BLACK, Editor.

Vol. XIV.

WOODSTOCK ONT., NOVEMBER, 1918

No. 10

CONTENTS FOR NOVEMBER

- Britain's Need—Canada's Opportunity.
Shocking Loss of Life, U. S. Forest Fires.
The Lesson of the Minnesota Disaster.
Why Aeroplanes Need Spruce.
Using Farm Woodlands Without Abuse.
"Trees."
A Poem by the Late Joyce Kilmer.
"Winter Injury to Trees, 1917-18"
"Logging Engineering and Forestry Practice."
"The Forest Policy of France."
"A Scheme to Afforest the Prairies."
Forestry and Apple Growing."
"New Use of Birch for Paper Making."
"Eastern Canada and British Trade."
"The New Birth of Forestry."
"Great Work of Overseas Forest Corps."
"A New Forest Insect Enemy of the White Birch."
"The High Mortality of Balsam Fir."
"Forest Protection in British Columbia."
"With a Forester in a Tank Corps."
New Ways in the Woods."
"The Prop of our Empire."
"The Case for Nova Scotia's Forests."

The Canadian Forestry Journal will be sent to any address for one dollar a year, subscription including all other publications of the Canadian Forestry Association.

Address all Communications to

THE CANADIAN FORESTRY JOURNAL
206-207 BOOTH BUILDING, OTTAWA

Printed by the Rod and Gun Press, Woodstock, Ont.

Entered at the Post Office at Woodstock, Ont., as second-class matter.

Britain's Need---Canada's Opportunity

BY SGT. JAMES R. DICKSON,

*Canadian Forestry Corps, England, late of Dominion
Forestry Branch Technical Staff*

Is Canada Prepared to "Grasp Occasion by the Hand" ---A Striking Discussion of After-War Conditions

These are fateful days of change, when the great surging torrent of this World War is sweeping away old conventions and customs, and in no other sphere is this tendency more marked and more potent than in international trade. When the flood subsides it will reveal world commerce beginning to flow along many new or altered channels, and for Canadians one of the most profitable and far-reaching of such after-war trade developments may well be found in Britain's imported timber requirements.

In order to grasp the situation it will be well briefly to consider Britain's position in this respect in 1913, and what the outlook is likely to be in 1920, as influenced by the war.

Pre-War Conditions.

The British Ministry of Reconstruction has recently issued a most informing and well-considered Final Report dealing with the whole question of Forestry in Britain; both from the standpoint of a National War Insurance Policy and on the broader basis of total trade requirements. The conclusion of the large and representative Committee who prepared this Report is that the question of Britain's future supply of coniferous timber is: "A very grave and a very urgent matter," and they regard the possibility of obtaining this supply from Canada's timber farm as: "An Imperial question of the first magnitude, which deserves the immediate attention of the Imperial and Dominion Governments."

Members of the Canadian Forestry Association who wish to acquire a basis of information for the consideration of this problem would do well

to become familiar with the data and findings of this most interesting and important Report.

This Report indicates that in 1913 Britain imported the equivalent of some 650,000,000 cubic feet of round timber of such species as might have been grown at home, that is to say exclusive of tropical woods. She imported in 1913, 90% of her total needs in wood, wood manufactures and wood pulp. For the past several decades the British per capita demand for wood and wood products has been increasing three times as fast as the population, and during recent pre-war years this *increase* has been, in concrete figures, approximately 5,-000,000 cu. ft. per annum.

In 1913 British forests covered less than 4% of the total area of the country and were producing less than 15 cu. feet per acre per year, whereas the other Great Powers of Europe (except Italy) had from 20 to 40% of their total areas in forest, with acre yields of from 25 to 90 cu. feet per annum. depending on the measure of science employed. From all of which, and many other comparative facts which might be quoted, we see how extremely dependent on outside sources of timber supply Great Britain was at the outbreak of this war, and what an insignificant place she accorded to the great Science of Forestry.

In 1913 Russia supplied, roughly, 50%, and other foreign countries some 30% of the timber imported by Britain, leaving (outside her domestic production of 10%) only a paltry 10% that came from sources within the Empire,—i.e. practically, from Canada and Newfoundland. This Canadian quota of some 35,000,000

cu. feet was relatively less than half what it was at the beginning of this century, whereas in the same period our Canadian exports of wood and its products to the United States had nearly doubled in value.

Such then, boldly outlined, was the position of the British timber trade and its main channels on the outbreak of the "Great War."

The Outlook for 1920.

The effect of the war on Britain's timber supply has necessarily been very great. Should the conflict last another year her native forest of commercial value—both capital and growing stock—will largely have vanished, and for the rest of this century it must remain all but negligible as a factor in supplying her markets. Then, of course, Britain's enormous overseas timber trade with Russia and Scandinavia has been very seriously interfered with, and whether it will again renew its old channels is a matter of growing uncertainty and concern. In this connection we must not forget that for many years both Norway and Sweden have been growing apprehensive of the way in which their annual cut was exceeding the annual growth, and that during the 15 years preceding the war their annual exports to Britain fell off by 30%. When the war ends the available supply is apt to be largely absorbed for many years by the vast near-at-home demand for deferred and reconstruction projects of every kind throughout the war-swept zone. Moreover the profound social, economic and political changes occurring among the Russian people will probably ensue in a general higher standard of living and an industrial development that must more and more limit and restrict their available timber for export. Therefore it comes that today we see the people of Britain in general, and her Industrial Captains in particular, developing an unwonted interest in Forestry matters. She is eyeing the World's distant, decreasing woodlots, meditating over that inescapable "long time" element and saying to herself, as it were: "Now, what is the best solution?"

Canada's Opportunity.

"There is a time" in the affairs of nations as well as individuals, no doubt, which "taken at the flood leads on to fortune," and what a stroke of good fortune, both for patriotic and business reasons, to have this chance of linking up the Empire's greatest timber farm with its greatest market!

Sir Wilfrid Laurier once succinctly defined Conservation as "Wise use, wisely regulated." Let us, as Canadian citizens, sovereign joint owners of our great timberland farm covering 70% of the Dominion, apply this principle to its development with our ideal: Every acre a producing acre, and every acre to its best use.

Britain has vainly tried to establish Forestry under private ownership of the Nation's timberland. The "long time" element damns every sporadic effort. Here in Britain they are still in the futile stage of trying to educate private owners on Forestry matters, instead of educating public opinion. We Canadians are fortunate in being in large measure free from this "stumbling block," but it behooves us to see to it that the insidious hand of Privilege is not permitted to undermine this only and essential basis for a real forest policy. *Viz:* What guarantee have we that the present Federal Procedure as regards transfer of Berth Licenses is not creating "vested rights?"

It is easy to say: "Apply a Principle," but the problem thus placed before us is, of course, a great and many-sided one. As I see it the chief factors are:

1. *Education of the Body Politic.* so as to bring the Canadian communities—whether Dominion wide or Provincial—who own practically all of our absolute timberland, into a position where the Executives concerned will be given adequate authority to deal with all matters affecting production and disposal of the timber crop, under the driving power of a strong, active, well-informed Public Opinion. In this pioneer field of propaganda the Canadian Forestry Association has already

done very much excellent and essential work, the fruits of which we see in the several vigorous Government Forestry Organizations. But still our great need is for further education.

II. *Organization*, which shall satisfactorily relate together on business and scientific principles the community of interests involved—to wit, the Sovereign people, Owners of the Land and providers of Labour, the Lumberman, who furnishes Capital and Enterprise; and the Consumer, who offers the market. Among the more important features of such organization would be:

III. *Land Classification* to enable permanence of use and stability of policy.

IV. *A System of Protection* providing adequate security against fire and other enemies.

V. *Applied Science in the forest*, to build up a normal growing stock of the favored species and thereafter ensure a steadily-improving, sustained annual yield. This technical work calls for a personnel of trained men, versed in silvicultural practice: the management of forest experiment stations; wholesale collection of tree seeds; the combatting of insect pests and tree diseases; the skilful handling of nursery and seeding operations; the preparation of clear, concise Reports and Bulletins, and having sufficient knowledge of forest mensuration and engineering to most cheaply and easily harvest the timber crop, and supervise the construction of such permanent improvements as roads, bridges and Ranger cabins. And lastly, organization should provide for:

VI. *Satisfactory Transport Arrangements* by land and sea, and the development of the British Market.

It must be evident that a great export trade in Canadian timber—chiefly “White Deal” and wood pulp from the eastern Provinces, and dimension stuff from British Columbia, through the Panama Canal—is dependent upon return cargoes for the transport lines or tramp steamers involved. Nor is this any mere detail in the scheme but an important

and determining factor in its successful working out. It simply amounts to this, that if Britain is to take Canadian timber and timber products she can only do so by exchanging some kind of goods in return. The hoary old fetish that in international trade gold can be got for goods, has long whiskers now, and is getting so many hard knocks these days; that it can hardly survive the war.

We see then that this splendid prospect for the profitable development of our Canadian Timber Farm is conditioned on securing greater freedom in trade relations between Canada and the Mother Country, and probably it is here, on a question of economic policy, that more education and effort will be required than to solve either the technical or marketing problems involved. However that may be, there is no doubt at all that the close of this war will unfold for Canada a wonderful opportunity to acquire the profit and honour of becoming Fir-and-Spruce-Grower-in-Chief to the Empire. Are we prepared to “Grasp Occasion by the hand?”

LATE F. B. ROBERTSON

Pte. F. Bruce Robertson, formerly of the Dominion Forestry Department, who has paid the supreme sacrifice for king and country, was killed in action on September 9th, his twenty-sixth birthday.

Before coming to Ottawa, Pte. Robertson attended the faculty of Forestry, University of Toronto, where the honor of class president was conferred on him by his fellow students. He was granted his degree of Bachelor of Science in 1914 leading his class. From then until his enlistment in October, 1915, he was employed in the Dominion Department of Forestry. He went overseas with the 4th University company, reinforcing the Princess Patricia's, and later was transferred to another battalion. He had been through several important engagements.

Shocking Loss of Life, U. S. Forest Fires

Five Hundred Bodies Recovered in Minnesota Holocaust of Middle October

Duluth, Minn., Oct. 13.—With probably five hundred persons dead, thousands homeless and without clothing, and with property damage mounting far into millions of dollars, whole sections of northern Wisconsin and Minnesota timberland, to-night are smouldering, fire-stricken areas, with only the charred ruins of abandoned, depopulated towns to accentuate the general dissolution.

The bodies of seventy-five victims lie in Duluth morgues. Hundreds more along the roads leading to Duluth and Superior lay where they fell when overtaken by the fire.

Twelve thousand homeless and penniless refugees, all in need, more or less, of medical attention, are quartered in hospitals, churches, schools, private homes and in the armory here, while doctors and nurses sent from surrounding communities attend them, and nearly every able bodied man in the city has been conscripted to fight the flames which now are dying away.

Definite confirmation was not available, but incendiaries were driven away from a local shipyard when the fires in Duluth and Superior were burning at their height, according to F. J. Longren, fire marshal, and other city and state officials.

Reports reaching here by courier told of widespread destruction, but it was evident that in most cases the fury of the flames was spent. Duluth and Superior are in no further danger. Virginia is safe and Brainard was untouched. However, peat bog fires are now said to have menaced the latter city.

Greatest loss of life and property damage is believed to have occurred in the Cloquet region, where a number of towns have been destroyed and all semi-rural settlements virtually wiped out.

A special train of 20 coaches brought 1,500 refugees from Clo-

quet and Carleton. They confirmed reports that many persons lost their lives in those towns.

A \$35,000,000 LOSS

Should the insurance loss equal or exceed \$15,000,000, and it is believed that it will be fully that much, the recent forest fires in northern Minnesota represent the greatest conflagration since the San Francisco fire in 1906, according to the "Insurance Field." The property loss is placed at \$35,000,000. The biggest property loss was at Cloquet, Minn., where the loss on lumber alone is placed at \$6,000,000, with the town suffering a million dollars more. These figures take no account of the destruction standing timber and young growth.

SOLDIERS FIGHT FIRES

Aberdeen, Wash., Sept. 30.—With the woods dry as tinder, following six weeks without rain, logging camps where soldiers are employed, were under strict guard Sunday. One hundred soldiers from Camp Lewis were sent Saturday night to Lindberg, Lewis County where a bad fire was reported to the spruce division headquarters here, and soldiers were likewise fighting fire at Norton, Lewis County. Major Hightower, district commandant, asked Portland general headquarters of the spruce production bureau Saturday night that troops be held in readiness at Vancouver to be sent any place in the district to assist in fighting fires in case of need.

The most serious fire in Gray's Harbor region Sunday night was that raging in the Matlock district, where the Callow mill and three camps of the Simpson Logging Company had been burned, together with number of ranch homes.

The Lesson of the Minnesota Disaster

By W. T. COX, STATE FORESTER OF MINNESOTA

A Terrible Waste of Life and a Vast Property by Insufficient Rangers and Lethargic State Policy

Every one is interested in knowing how the great fire calamity came to occur,—the extent of loss of life, what areas were burned over, and how much material damage was done. It will be some time before accurate information is available on some of these points, but enough is already known to render a general statement advisable. Many consider the calamity a mysterious or unavoidable visitation. This, however, it was not, as the forest rangers and others who have made a study of fires will testify. Groups of quietly smoldering fires were fanned by a sixty-mile gale into running fires that united to form a solid front. The force of the gale was so great that the fires were driven forward on a front which constantly diminished in width. The several intense fires, therefore, were in comparatively narrow strips, separated by large belts of green timberlands; and twenty miles is perhaps as great a distance as anyone of these fires traveled.

These fires, like all other great forest fires, resulted from carelessness on the part of a great many people. Incendiarism in the sense of setting fires deliberately to destroy property (through a conflagration) was not the chief cause. The devastating fires of October 12th sprang in the main from slow-burning marsh or bog fires, the number of which had been increasing as the fall season opened up. These fires were set by careless people traveling over peat road grades, by railroad locomotives, or by land owners who were willing to risk their own and their neighbors' families in the hope of finding an easy way of clearing their marsh, peat, or cut-over lands. While fire may at times be used in land clearing, it has been demonstrated that the time and method cannot be left to the judg-

ment of settlers, loggers and railroad companies.

Value of Skilled Rangers

With a sufficient number of forest patrolmen and rangers to see that burning is done only under proper restriction and control, and to see also that any fires which may start accidentally or otherwise are promptly extinguished, there would be no opportunity for a big fire to come into existence and gain headway. Even during a high wind the starting of one fire is not likely to destroy a whole community. The harder the wind, the less the fire would spread out. It then travels in the form of a streak, which can be fought successfully at the sides, and from which escape is relatively easy. It is only when a fire has been allowed to burn long enough to attain a wide front, or when a number of small fires are close enough together to easily unite thus forming a wide front, that settlements are seriously endangered. Neither of these conditions should ever exist, but to prevent them requires systematic patrol by a considerable force year after year, throughout the danger seasons. A large force of inexperienced help for a few days is of value only in a defensive way and for the time being.

Magistrates too Easy.

During this fire season the few rangers and patrolmen discovered and extinguished hundreds of fires. They arrested 60 persons and convicted 32 persons. Light fines were usually imposed. However, this did not suffice, since many other fires were not discovered or reported until they had burned out or got beyond control.

Although authentic figures have not as yet been compiled, it is known that several hundred settlers lost their lives in the recent forest fires. A great difficulty is that settlers seldom

know the best means of saving themselves.—many of them being new to the woods. One of these fires swept through an Indian reservation, but the Indians were able to take care of themselves and not one was lost. Prompt and vigorous action on the part of the rangers undoubtedly prevented several fires from becoming disastrous, and many people owe their lives to warnings and help given by forest officers.

Fire Hazard Increased.

While the first impression is likely that devastating fires such as these hasten land clearing and development, observations and facts point strongly the other way. Foresters do not ask that their opinions in this respect be taken without further proof, but welcome a thorough investigation to determine exactly what has taken place on the scenes of great conflagrations. Moreover, it is a fact that devastating fires do not remove the fire danger, but frequently render the burned area more subject to dangerous fires. If clearing followed immediately after the fire, there might be some advantage; but settlers are seldom able to undertake land clearing on a large scale. A forest fire does not consume much of the standing timber or stumps. Within three years after a fire, the dead trees are worthless, mostly blown down, and in excellent condition for further fires, which by that time would be fed by a growth of grass, weeds and brush. Any one who realizes what this means would be remiss in his duty if he failed to give warning of the fire hazard.

Law and Enforcement.

The lack of a large enough force of men trained in fire prevention work is the chief cause of the calamity. It was against the law for people to set fires during this period. It is against the law to run locomotives or threshing rigs that set fires. It is against the law for people to ride along highways throwing burning cigars, cigarettes or matches into the dry timber alongside. It is against the law to do a great many things, but a law in itself is of little value unless the

machinery for its enforcement is provided. What is one policeman (forest officer) to seven hundred or twelve hundred square miles) or twenty to fifty townships?

The exceptional drouth of the present as well as last year was another factor of importance. It was on account of it that the Forester asked for an order which was issued by the Commission of Public Safety declaring a closed season on burning. This order covered the spring and fall seasons of 1917, and was renewed to cover the spring, summer and fall seasons of 1918. These orders were widely published and conspicuously posted in all directions, but in spite of this precaution and the convictions secured under the order, and because of inadequate forces to police the forested areas, fires developed faster than they could be extinguished and the guilty parties brought to justice.

Over-drainage, a Cause

The feeling that big fires will occur anyway and that it is futile to fight them is a contributing cause of them, and comes from lax reasoning. Fires are not necessary, nor are they unavoidable. A conflagration arises from a small fire allowed to attain large proportions, or a group of small fires when circumstances like wind and drouth are favorable.

In recent years many millions of dollars have been expended in partially draining swamp lands far in advance of settlement. In the absence of control-gates in the ditches, this has resulted in over-drainage, as we have repeatedly protested, and greatly increased the fire risk and waste of timber and soil. As a result, there are thousands of miles of drainage ditches that have made the worst kind of fire traps and the fires in them are most difficult to handle.

Logging Dangers

There has been insufficient control of logging operations, and this too has proved a difficult factor in fire prevention work.

The unregulated scattered settlement of land constitutes not only a needless hazard to human life but a waste of man power. Had the settlers in the burned districts been con-

centrated in areas near the villages there would have been little if, any, loss of life. In each place there would have been several sections of cultivated farms and a community of good progressive citizens. There is need for a clean-cut land policy to direct settlement.

The attitude of the judiciary has not been the best. Justices and muni-

cipal judges have been slow to enforce the forest law.

There has been insufficient co-operation by railroad and lumber companies in fire prevention work.

Penalties for violations of the forest laws are too light, and the laws are weak in certain other respects.

Why Aeroplanes Need Spruce

Many have doubtless been puzzled over statements that the airplane output was limited by the output of spruce. *Engineering and Contracting* elucidates:

"The average airplane contains less than 170 feet board measure of spruce. An ultimate monthly output of 10,000 airplanes would therefore involve only 1,700,000 feet—a really small quantity of lumber. Then why was there a shortage of airplane stock? Until very recently it required 70 feet of timber in the tree to furnish one foot in an airplane. About 15 per cent. of the timber in the tree was clear enough and sufficiently straight-grained to be suitable for airplane stock, and less than 10 per cent. of the stock was used in the finished plane. However, about 20 per cent. of the stock is now used, and the engineers hope to increase this to 30 per cent. The Sitka spruce of northern California, Oregon, and Washington supplies 95 per cent. of the lumber used by our Government and its Allies for flying-machines. This spruce is lighter and more resilient than any other timber

available in large quantities, being fully 10 per cent. superior to Douglas fir. Less than a year ago the Spruce Production Division of the United States Signal Corps began organizing the spruce-lumbering industry. There were only 3,000 men in the spruce camps of Oregon and Washington last November where now there are 10,000. Some \$3,500,000 worth of logging engines, wire rope, and steel rails were secured for use in these logging-camps, and a hundred mills are engaged in sawing the lumber. Recently the head of the German aviation forces told German reporters that America's talk about producing 50,000 airplanes before the end of the year was only another sample of American bluff. It is well that he thinks so. Our output of these machines is fast reaching a rate that will be quite as amazing to the Germans as our ship building output has become. Liberty motors, spruce, and other airplane essentials have already reached 'quantity-production' rates, and will be delivered according to a schedule that provides ultimately for 100,000 flying machines annually."

Mr. R. H. Campbell, Director of the Dominion Forest Branch is still in the hospital at Winnipeg, but is improving nicely.

Lieut. Wm. Kibly of the Royal Air Force is now completing his

course of training in Canada, as pilot. He was formerly fire inspector for the Canadian Northern Railway, and secured a commission with one of the battalions of Highlanders, being afterwards transferred to the Royal Air Force, where he had experience in France as an observer.



A NOVA SCOTIA SCHOONER COMPLETED OCTOBER, 1918,
AT ANNAPOLIS ROYAL



LOGGING WITH OXEN NEAR BEAR RIVER, NOVA SCOTIA

Using Farm Woodlands Without Abuse

By G. R. Tillotson, U. S. Forest Service

Farm woodlands are to-day being drawn upon for large quantities of timber for war purposes.

Farm woodlands are also furnishing perhaps double the ordinary amount of wood for fuel. This increased demand may result in considerable and lasting damage to the woodlands unless certain precautions are taken. On the other hand, the cutting of cordwood affords each owner of woodland an opportunity to clear his land and put his timber in better condition. To accomplish this the idea to keep in mind is to remove for cordwood the poorer, less valuable trees, leaving the better ones to stand. In removing the fuel wood the greatest precaution should be taken not to injure the more valuable trees or the young growth. Briefly, the material which should be removed is as follows:

1. Sound sticks lying on the ground. This will include tops which have been left in logging operations, and trees which have been blown over by the wind, crushed down by snow, or otherwise toppled over. If left on the ground these tops and trees are a serious fire menace, will eventually rot, and are then of no value for any purpose.

2. Dead trees which are sound and still standing. They are usually dry, make good firewood, and are of no account in the woods.

3. Trees which are diseased, or are so seriously injured by insects that they will probably die; and also trees which are specially subject to serious disease or insect attack. By cutting them out the spread of the disease or insects may be checked.

4. Crooked trees which are crowding out straight ones. The former will not become valuable timber trees while the latter may.

5. Large old trees unsuitable for lumber, and having big tops which

shade out numerous smaller trees growing beneath them.

6. Small trees which are overtopped and stunted by larger and better ones. The former are not likely to develop into trees of any value.

7. Trees of the less valuable kind which are crowding good trees of the more valuable kinds. Thus a black oak or a beech which is crowding out a white oak or a hard maple of equal size and health should be removed.

8. Trees which by some chance are growing on ground unsuited to them. They will not grow into valuable lumber trees. Thus a yellow poplar on a dry ridge should be cut out in preference to a hickory, an oak, or a pine in its locality.

9. Slowly growing trees which are crowding out equally valuable kinds that grow faster. Thus a white oak, hickory, or sugar maple should be removed in preference to a yellow poplar, black walnut, or ash.

10. Trees badly fire-scarred at the butt. These are of less value for lumber than sound trees. They usually become rotten, and are among the first to be blown over by heavy winds.

11. The ideal trees for cordwood are those which range from 4 to about 10 inches in diameter. The yield of cordwood from trees smaller than 4 inches in diameter is very slight, and trees larger than 10 inches in diameter are usually more valuable for some other purpose, unless they are defective.

The Forestry Journal will be sent to any address in Canada for One Dollar a Year.

Trees

BY JOYCE KILMER

(A. E. F.; Killed in France)

I think that I shall never see
 A poem lovely as a tree.
 A tree whose hungry mouth is pressed
 Against the earth's sweet flowing breast;
 A tree that looks at God all day
 And lifts her leafy arms to pray;
 A tree that may in summer wear
 A nest of Robins in her hair;
 Upon whose bosom snow has lain;
 Who intimately lives with rain.
 Poems are made by fools like me,
 But only God can make a tree.

Winter Injury to Trees 1917-18

BY W. T. MACOUN, DOMINION HORTICULTURIST

Most Damaging Season Since 1903-4. Too Much Tree Moisture Lost to Permit Recovery

The severe winter of 1917-18 caused the death of many native trees in Canada and exotic trees and shrubs, including tree fruits, suffered badly. Not since the winter of 1903-4 has there been such injury to trees in Eastern Canada. The winters of 1903-4 and 1917-18 were very much alike in that the temperature rose above freezing on very few days, and there was little thawing in Eastern Ontario and Quebec, where most of the injury occurred, for nearly four months. During the winter of 1903-4 the temperature was below zero, Fahr., on 58 different days at Ottawa, while last winter it was below zero on 57 different days. The lowest the temperature went at Ottawa in 1903-4 was 30.2 degrees F., below zero, and the lowest in 1917-18, 31 degrees below. The character of the winter at Ottawa is given as an example of what occurred in other parts of Ontario and Quebec, the tempera-

tures being much lower in some places than they were at Ottawa.

Forms of Frost Injury.

In the bulletin called, "The Apple in Canada," by the writer, thirteen forms of frost injury are described, namely, 1. Root-killing; 2. Bark-splitting; 3. Trunk-splitting; 4. Sun-scald; 5. Crotch Injury; 6. Killing Back; 7. Black Heart; 8. Discolouration of Sap Wood; 9. Trunk or Body Injury, including Killing of the Branches; 10. Killing of Dormant Buds; 11. Winter Killing of Swollen Buds; 12. Frost Injury to Flowers; 13. Russeting of Fruit Due to Frost.

The winter killing in 1917 was mainly due to Trunk or Body Injury, including killing of the branches, although some of the other forms of injury were found also. The trees matured their wood well in the autumn of 1917.

In the writer's opinion, the reason why so many trees were killed is that, owing to the long continued

cold weather without thaws or moist air, the trees steadily lost moisture until they lost too much to recover. The fact that trees lose moisture in winter has been proved by analysis of twigs. Sudden low drops in temperature may also have caused part of the injury.

Reports were received of Sugar Maples being killed in the province of Quebec and other native trees, including White Pine, being injured or killed. In some cases the leaves of the pines were killed but the buds remained alive and new leaves developed.

At the Experimental Farm, Ottawa, trees native of South Western Ontario, such as, Sweet Chestnut, Tulip Tree, certain species of Oak and Honey Locust were killed or badly injured, and, among pines,

the Bull Pine of British Columbia suffered considerably. Among exotic trees, the Oak, Elm, Ash and Horse Chestnut were among those badly injured.

Hardy Apple Trees Died.

It was noticed, among apple trees particularly, at Ottawa, that some of the hardiest varieties were killed. In most, if not all of such cases, the trees had made little growth the previous year, or had borne a large crop of fruit, with the result, in our judgment, that they were very low in sap when winter set in. Other less hardy varieties, which were killed, had made good growth the previous year. In many cases the trunk and lower parts of the main branches were the parts killed, the younger branches remaining alive until there was no sap to support them.

Logging Engineering and Forestry Practice

BY DR. JUDSON F. CLARK, VANCOUVER

Until such time as lumber prices substantially and permanently advance, the main hope of bettering forest finances and thereby widening the field where forestry may be practised, rests in the lowering of the costs of marketing the forest crop.

Logging engineering is at present our best hope for the larger stumpage returns so necessary for the extension of forestry methods. In the past it has been developed almost entirely

by practical men who have had but limited opportunity to know and see what the other fellow was doing. For the future, the forest schools should become clearing houses for information discovered and better methods developed all along the line and thus become at once the source of supply for our specialists and the training ground for our every-day foremen loggers.

Switzerland's Forests Worth £58,000,000

The value of the Swiss forests, calculated on a 3% yield, is over £58,000,000, or about the total of the debt for the federal railways at the end of 1915, whereas there are only 200 officials to administer the public forests, which have a minimum value of over £26,000,000.

MUCH B. C. SPRUCE LEFT.

In response to the fears expressed that the large amount of spruce being

cut for the Imperial Munitions Board for aeroplane construction would deplete the spruce forests of Northern British Columbia, it is authoritatively stated by the Department that at the present high rate there is enough spruce in the limits now being worked to last for two years, and that there is not the least doubt that very considerable stands of suitable timber can be located to provide an even larger output if necessary.—Vancouver "Industrial Progress."

The Forest Policy of France

We have now been virtually nine months in the advance section," writes First Lieutenant Lawrence R. McCoy of the 20th Engineers (Forest) "and on account of the variety of landscape, we find all species of timber and many odd operating conditions. Some of our operations are in a mountainous country in excellent fir and spruce forests that have been carefully guarded and are forested by selective cutting, and if necessary by seeding, these war times and it is very surprising to us to find that this conservative French forestry policy is virtually unchanged in national and communal forests up to within five miles of the front line trenches. As a result of this far-sighted policy we have been able to cut as high as 55,000 feet of fir and spruce timber per acre on some small tracts of 40 to 50 acres in extent although of course the general average throughout our operations will not run as high as this. In the flat country we are operating in several excellent hardwood forests, some of the old oak timber running 50 inches on the butt. One can imagine the difficulties in attempting to saw such large timber into

heavy 32-foot construction timbers on a sawmill carriage built to open only 30 inches. A large percentage of the timber, however, runs only 18 to 20 inches, which easily works up into railroad ties and light structural lumber. These hardwood forests are generally divided up into several small coupes of from 12 to 25 acres each, having an annual rotation of from 25 to 30 years. About one-third of the reserve of large trees will be cut on a coupe and all of the coppice, or brush, cut out for fuelwood, leaving possibly 75 baliveaux or small trees out of the coppice per acre. The roots, when properly cut level with the ground, send up strong sprouts which in 20 to 25 years develop into a very heavy mass of underbrush which produces good fuelwood, and the baliveaux eventually mature into good saw timber. On account of this selective cutting, we find very few defects in either soft or hardwood timber and the timber is bought on a solid cubic meter volume basis. Of course there are many exceptions to the above, and in some pine forests in particular, that are hand planted, the cutting is complete and not on a selective basis.

A Scheme to Afforest the Prairies

BY THOMAS TOD, RUSSELL, MANITOBA

The suggestion I have to make is, that in sparsely wooded and unwooded districts, the requirements to obtain the patent for a homestead be changed from the 15 acres cultivation or other present improvements required, to the thorough cultivation and **SOWING WITH TREE SEEDS**, a strip 100 feet wide on two sides of the settler's holding. The amount of land this strip would take up would be a fraction over 12 acres on 2 sides of a section. Any quick growing variety of the seed would do, Poplars, Maples, Willows, some of the

conifers and hardwoods might be tried, according to locality. That such a scheme is practicable I have ample proof, both in the case of land treated as proposed, cultivated and sown with tree seeds, of which I know several most successful cases, and also in the case of self sown poplar bluffs after fires. There are many localities in this district that have been entirely denuded of wood by fires that are now covered with self sown timber of from 6 to 8 inches in diameter, grown within the last 15 or 20 years. These facts which can

be amply and undeniably corroborated, remove the suggestion from the realm of pure theory. What are likely to be the effects of such a scheme if carried out on a large scale? It would certainly, in the long run, improve the climate, and increase the rainfall, and have a tendency to conserve the moisture. It would afford shelter to the individual settler and his stock. It would in time modify, if not abolish blizzards. It would ultimately help the settler as to timber, fencing material and firewood. Game and the wild fruits are almost certain to largely increase, and if the larger fruits, as apples, etc., are ever generally grown, it is only likely to be under some such conditions. It would make traveling along the sheltered roads a pleasure, instead of the terrible ordeal it at present must be on these bleak treeless plains, and I believe might ultimately eradicate summer frosts. My nearly thirty years experience in this country, forces the conclusion upon me that the places where grain is least affected by frost are either on a southern slope or have timber on the north or east of them. Any abandoned or unoccupied homestead so treated would not be simply a curse of a weed bed, as is now the case, but would be a much appreciated legacy handed down to the next occupant. These are some of the benefits that would likely follow the adoption of such a proposition. And I would leave it to the imagination of those who know the country, what its general effect would be in, say twenty years. What would it cost?

Pass the law. Make it compulsory. The divisional surveyor's field books would show where exemptions from it might be granted. Let the Government furnish the seed and employ homestead inspectors to see its terms carried out. The Indians and school children could be enlisted under direction. As to the seed, the demand would soon create the supply. In some seasons tons of it could be gathered in Manitoba and doubtless in some parts of Saskatchewan and Alberta. As to fire protection: For some time the cultivated strips would act as fire guards and afterwards no sane man would leave such a valuable assets as twelve acres of live wood without protection. Railway lands and lands held by speculators would have to be dealt with separately. But it is clear they would fall behind in value in the market in competition with land with wood on it. Still these lands would derive a substantial benefit from the shelter, and general amelioration of the district through the homesteaders' work, and if kept persistently unforested might be made to pay a higher ratio of taxation for the unearned increase. All lands so forested could be made free of taxation as long as they remained so. In closing I would point out that the adoption of the above scheme does not necessarily interfere with the settler's cultivation of his land for cropping purposes, but that the delay in fulfilling the law would result in the like delay in the granting of his patent.

THOS. TOD.

Campers Arrested 100 Miles From Fire

San Francisco, Cal.—The vigilance of the forest service as well as the relentless manner in which they follow up those who, through negligence or other reasons, endanger a community to the ravages of conflagrations is exemplified by a recent case.

Two men left their camp fire burning. Although the smoke was

almost immediately detected by the forest fire lookouts, it was supposed that the county supervisor was burning drift and other debris. It was found that a camp fire had been left burning and had burned into the surrounding forest, threatening to destroy not only the timber, but also the county bridge. Also it was learned that the two men had left the fire burning and after certain evidence

had been secured efforts were made to locate them.

Five days later one of the men was arrested more than 100 miles from the

scene of the fire. Two days subsequently the second man was apprehended. They will be tried for leaving a camp fire unextinguished.

Forestry and Apple Growing

By the Editor of the Toronto "Globe"

When most of one's life time is spent in the same locality changes which go on from year to year, and in the course of time become almost revolutionary, pass almost unnoticed. When another, after an absence of 30 years, returns to the same locality, the extent of the changes which have taken place is observed at once, and the possible effects of these naturally become a subject of enquiry.

Mr. W. H. Belford of The Winnipeg Free Press, recently visited his old home in Northumberland county for the first time, in summer, since 1888, and to him some things that have taken place in the time stated caused both astonishment and regret. Orchards which were bent to the ground with apples in the autumns of his boyhood he found bearing exceedingly light crops this year. To him the statement that this was due to the peculiarly trying conditions of last winter did not furnish a sufficient explanation of the difference in yields between now and then. In his view the cause of this difference is found in the fact that a country once well wooded is now almost bereft of forest trees and that a free sweep has thus been given to the cold, dry winds of winter.

Other causes than the one mentioned by Mr. Belford have, however, been at work. Scarcity of help and uncertainty as to markets have led to neglect of the sparring, pruning and cultivation now necessary to the production of apples in this Province. Still there is no doubt as to the evil effects on the apple growing industry due to the unwise cutting of forest timber that has taken place. The removal of nature's protection has subjected orchards that were well cared for to climatic conditions

which even these could not resist. The severity of these conditions has not only reduced the apple crop of this year, but it has so weakened or wholly destroyed thousands of trees that a shortage in fruit is bound to be experienced for years to come.

The condition of Ontario orchards in 1918 affords one more reason, and an exceedingly cogent reason, for the adoption of a reforestation policy in Ontario.

READER !

THE CANADIAN FORESTRY JOURNAL puts on a new dress commencing with the January issue.

It will be printed on the first grade of coated paper.

The pages will be somewhat larger and quality of text and illustrations will be correspondingly improved.

New Use of Birch for Paper Making

Important Experiments May Prove Great Boon to Spruce and Balsam Forests

The most serious obstacle to the proper handling of the mixed forests of eastern Canada has been the lack of utilization of the hardwood species, particularly birch. This has been especially true as to mixed forest lands held as pulpwood limits, where, over vast areas, the coniferous species comprise only from 25 per cent. to 50 per cent. of the stand, the balance being hardwoods. The cutting of the conifers, particularly spruce and balsam, has a constant tendency to convert the stand into a hardwood forest, partly because of the actual reduction in numbers of the conifers, while the hardwoods are left standing; and partly because the coniferous seedlings are prevented from making adequate growth, on account of the dense overhead shade of the hardwoods, which spread out and close in the spaces made by the removal of the conifers.

Effect of Cutting Birch.

If the hardwoods, particularly birch, could be used to commercial advantage, their removal would permit spruce and balsam seedlings to come in much more satisfactorily and to make a much better rate of growth, on the average, instead of so many remaining suppressed for a long period of time.

The primary reason why the hardwoods have not been utilized in most of our northern forests has been the difficulty of transportation, in the absence of railways. Hardwoods are too heavy to be driven long distances in streams, without very severe loss by sinkage; and besides, the amount of flood water in the majority of driving streams is hardly adequate in volume to float the spruce and balsam to their destination, to say nothing of carrying large quantities of birch in addition. As a consequence, birch has remained practically a weed tree over enormous areas of our eastern forests where

there is no rail transportation.

At last, however, there is a possibility that the problems of transportation may be at least partially solved through the winter use of motor tractors for log-hauling on iced roads. This would apply not only to hardwoods but to coniferous species as well, where, in the case of long drives, the loss by sinkage is serious, especially as to the smaller sizes, and more particularly in the case of balsam. Several concerns are experimenting, or are preparing to experiment, along these lines, the River Ouelle Pulp and Lumber Company being the pioneer in this direction as to eastern Canada. The Laurentide Company, Limited, has this year purchased some lighter tractors of the caterpillar type and will this winter experiment under conditions in the St. Maurice Valley. The use of tractors for log hauling is already established in parts of British Columbia and in various sections of the United States.

New Market for Birch.

The second obstacle to the removal of the hardwoods in our northern mixed forests has been lack of a suitable market, particularly by the pulp and paper companies, which hold rapidly increasing areas of such lands. Formerly, only spruce was accepted for use as groundwood in the manufacture of newsprint; later, balsam was accepted in an increasing proportion, and now both species are used practically without discrimination. It has always been considered impracticable, however, to use birch or other hardwoods acceptably for groundwood. The Forestry Department of the Laurentide Company has, however, for a long time urged that experiments be made with a view to the utilization of birch in the manufacture of newsprint, and an experiment was recently made by the Company which

appears to give excellent promise of satisfactory developments along this line. A test run was made, the results of which indicate that up to ten per cent. of birch groundwood can be used to excellent advantage in mixture with spruce and balsam groundwood in the manufacture of newsprint.

Great Boon to Conifers.

It is expected that further tests will be made, in collaboration with the Dominion Forest Products Laboratories. Should the final results be satisfactory, and should the use of tractors solve the problem of transportation to any material extent, a new era will be opened up in

the intelligent handling of our vast areas of mixed forests. It will then be possible to utilize large quantities of birch, in the manufacture of newsprint, thus materially relieving the increasing drain upon spruce and balsam, and at the same time leaving the corresponding logged-over areas in good condition for future production, instead of constantly depreciating their quality as has been the tendency under the only methods of operation hitherto considered feasible. Should these developments come to pass, forestry will find an immense scope for activity in our northern forests, replacing at least in part the destructive methods so generally practiced heretofore.—*Clyde Leavitt.*

Eastern Canada and British Trade

BY T. H. BLACKLOCK

Resident Editor of Montreal Gazette, in London, England

British and Canadian timber experts believe that for several years after war, Britain, France and Belgium will have to import practically their whole requirements of pit props, railway sleepers and heavy timber and deals. The home supplies will be almost exhausted and these countries must look to Northern Europe—Norway, Sweden, Finland and Russia—or to Canada, for ordinary requirements and for reconstruction work in devastated areas. Many Canadian timber experts, now in the forestry corps and combatant ranks, believe that Canada can capture the bulk of this trade if proper and energetic effort is made. They count Russia and Finland out of the market owing to present and in a great measure continued business and political disorganization. The supplies from Norway and Sweden are limited and also much of the timber business of these countries was due to Russian imports partially manufactured and exported to Britain. They also point out that for two or three years after the war Britain's timber imports

will be controlled by the government, as will in a measure ocean transportation facilities for this purpose.

Pit Props 700% Higher.

Pit props are selling here at present at twelve cents per foot for props three inches at the top. This is about seven times the price in pre-war times, and although it will decrease as conditions make for normal, yet for years it will be remunerative. The demand in Britain for pitprops is enormous. For sixteen mines near Doncaster the yearly requirements are about 32,000,000 and this area is only one of many throughout South Scotland and the Midlands. Railway sleepers will be required by the million and heavy timber to the extent of the entire requirements.

Look to Quebec and N. B.

Canadian hardwood with the exception of birch, will find but a limited market, as Britain's local supply has not been seriously impaired and her imports will be drawn from the East and Central and South America. Many are looking to Quebec and New Brunswick as the

field to meet the British, French and Belgian demands for pit props, sleepers and heavy timber, and believe that Canada's sailing ships now under construction will solve the transportation problem. They claim that we must produce to meet European requirements not according to our own ideas, and failure to do this in the past has been our greatest handi-

cap in developing trade. South Africa is another market for Canadian timber. There can be no question of the enormous requirements for Britain, France and Belgium after the war; the only question is whether this trade can be captured for Canada. Canadians here believe it can and are preparing to make the attempt.
T. H. Blacklock.

The New Birth of Forestry

BY DR. FILIBERT ROTH, ANN ARBOR, MICHIGAN

Science of Forest Management Brought Into Limelight by Wa's Exigencies---A Brief History

Forestry is entering a new phase; it is leaving the era of propaganda and entering one of business. It is leaving a period when a very small number of good people, mostly not owners of forest and without material interest in forest—advocated the practice of forestry, and they did this at a time when billions of feet of timber were without market value and when millions of feet of timber were, of necessity, unused and decaying in our woods, and when the men in charge of public affairs, quite generally, could see no use in any special public efforts, and the owners of timber were still finding it much harder to sell than to buy.

In Europe, forestry developed out of necessity; it started in the days of Charlemagne and took 1,000 years to grow into a science, an art and a business. Its entire development came before the advent of the railway; it came in a time when it was impracticable to haul timber overland, even for a short distance of 20 miles, and when as early as the year 1400 it was difficult in some localities to get building timber, while not 100 miles away millions of feet were without any market value.

In our country, forestry came, ready made, from Europe. Its introduction really came after the year 1870; it came long after the railway had become a success and was rapidly

extending over the land. In our country it was not the village, town and the State which was in danger of real timber—and even fuel—famine which saw itself driven to forestry by necessity, but, as stated before, it was a handful of far-seeing, well-meaning people who had become apprehensive and felt it their duty to call attention to the rapid destruction of the forest and the utter lack of any effort at its replacement.

France Since 1420.

As early as 1420, France had a state forest law of 76 articles and a state forest organization. At that time, even the written compilation of village and town laws, including forest laws of Central Europe, were over 100 years old. All public authorities, village, city and the multitudinal forms of autocratic authorities, by this time realized clearly that the forest was entirely different from the field; that timber and fuel land and care and a long period of were necessities; that it require time to grow timber; that it was hopeless to leave it to individual likes and dislikes, and that it was necessary for public authority to step in and use its authority and exercise its providential functions. The policies were promptly expressed in law; and the laws were in keeping with the times, simple and direct. Clearing of forest was forbidden;

likewise forest devastation: utilization was regulated, and the protection of forest received special attention. And all this, not because of any propaganda, but simply because the people, the owners of the woods and the users of wood realized the necessity of prompt and forceful action. But even so, forestry required a long time to grow, and Colbert, the great minister of France, two centuries later expressed himself in the famous sentence: "France will perish for lack of timber." He did not stop at this, however, but worked out his still more famous forest law of 1669, remarkable for being most complete and effective. Corrupt practice under the Bourbons led the Revolution to repeal parts of this famous law, but in 1801 and 1803, and finally in 1827, it was re-enacted, forms today, and is likely to form for a long time to come, the great guide and director of forestry in France.

The War's Demands.

Then came the war.

Before the end of 1916, it became very evident that even in this latest and greatest of wars it takes timber; that forests protect armies; that timber in enormous quantities is needed at the front, in the trenches, for shelters, covers, for roads and bridges, for barracks and hospitals; that much of our equipment needs wood of special kinds, and that even the flying machines require a propeller and frame of well selected and seasoned wood. It became evident that Germany's ability to hold out was in no small degree connected with her forests, and, for the first time it was brought home to our people that forestry differed from the field; that while in farm crops, of bread and meat, we live hand to mouth; in the forest crops, if properly cared for, as in Germany and France, we have 20 year's living ahead. Then came shipping difficulties, and by the beginning of this year Sir John Stirling-Maxwell, in England, made the statement in a public address:

"For the last three years every one engaged in the organizations for

war has known how dearly this country (England) is paying for the neglect of a great national industry (forestry) The Prime Minister has told us that timber absorbs more shipping than any other import, and that we can only insure imports of food by foregoing imports of timber. For the army we are mainly dependent on the French forests. *Had our Allies neglected forestry as we have done, the war could not, at this stage have been carried on at all* We had the great good luck to be able to import timber for the first two years of war, but the cost in increased price, freight and insurance amounted in these years to some 40 million (pounds sterling) more than we need have paid for home-grown timber."

The Forestry Sub-Committee of the British Reconstruction Committee states: "There appears to be no reason why the Canadian forests should not supply the United Kingdom with coniferous timber and meet its growing needs for many generations." *"Meanwhile the forest capital of Canada is growing less year by year. This we submit is an Imperial question of the first magnitude which deserves the immediate attention of the Imperial and Dominion Governments."* The Committee then recommends spending \$60,000,000 in a planting program of 40 years for the small area of waste lands, in the British Isles.

Here we have a small island country, close and convenient to large supplies of timber, suddenly waked up to the necessity of supplies of timber at home.

When our country entered the war, naturally everyone felt, that at least we would not have any trouble in getting timber.

But we had a great surprise in store. Everything of value was bought up and shipped. "This is my third trip here and I just closed a deal for a large lot of lumber which I refused to take on my last round," said the English buyer to one of our men. We needed ship timber; we needed everything clear up to seasoned mahogany, oak and walnut for

propellers for aeroplanes and spruce for their frames. We were fortunate in having it, at least as standing timber, in the woods. But it meant the creation of a separate army of men to cut and deliver spruce, to inspect, to dry kiln, as well as to manufacture wood for war purposes.

At last a new era has come. *Necessity* is stepping in and teaching the lesson in forestry to our people. She does it in her usual way; there is no argument; the shouter of substitutes; the wiseacre who would import our 40 billions from Alaska, where there is but a fringe of timber, and from Siberia, where there is less,—all the “*fs*” and “*cants*” take a back seat. Our people suddenly know that timber is a necessity; that we need lots of it and need it close at home, and that it takes land and a 100 years to grow. The “*Timberman*” of Portland, Oregon, says: “The lumbermen of the Forest Service should get together and work some definite plan for the perpetuation of our timber supply on some scientific and workable basis. The Government is interested primarily in the available supply of timber for the Nation’s use.” It adds: “*The growing of timber is a national function, it is not the business of an individual.*” Dr. Fernow may well ask in the Canadian Forestry Journal: “Has the public opinion yet been convinced that forest maintenance is a State Business?” At last forestry, as a simple and useful industry, stands on

its own merits. Whether our efforts will be chiefly National, and State, or whether we shall depend on private efforts is important but not vital; probably we shall utilize all and welcome all. But the lessons of Europe ought not to be lost, State forestry is the best and safest form, it does more and does it better. The least dependable is the small holder, where the son cuts down what the father has built up, and where all conditions seem to operate against the holding of the forest. Generally, encouragement laws have done but very little; coercive legislation, as tried in Europe, has done but little better, and universally the replacement of private effort by State action has proven most satisfactory from every standpoint. We are now ready for a large program in forestry in the United States; the outlook is of the best, and perhaps the most urgent and immediate need is for a goodly army of men, schooled and trained to make the plans and carry them into effect. Our country needs 500,000,000 acres of well cared-for and well regulated forest; it needs woodlots scattered through the greater part of our farm district, but to have this it needs also 100 well schooled men to every million acres of woods if they are to receive the care they need. The forests are calling, the people’s interest demand it, let us help and make the task worth while for our young men to build up the American forest.

Great Work of Overseas Forest Corps

The production of the Canadian Forestry Corps in France has been steadily increasing, and, from a total of 11,500 tons in March, 1917, made up of 5,500 tons of sawn material 3,500 tons of round and 2,500 tons of fuel, it has steadily grown until in May of this year it had almost reached a total of 150,000 tons, made up of 90,000 tons of sawn lumber 10,000 tons of round timber, and 50,000 tons of fuel. During this

same period the strength of the Corps increased; rising from a total of slightly over 2,000 in March, 1917, to a total of just under 13,500 at the end of May, 1918.

When the work was taken over by the present Directorate, there were approximately seven mills being operated by ten Canadian Companies, whereas, at the present time, there are fifty-one saw mills and two re-saw plants being operated by fifty-

eight Companies, in addition to which two other Companies are specially employed on aerodrome construction work with the Independent Force, R. A. F. Another interesting fact illustrating the growth of the Corps is that the production for the first six months of the present year was practically 50% in excess of the production for the whole twelve months of 1917.

During the first six months of this year, over 183,000,000 feet of sawn product have been produced, and, if approximate comparative values are given to the quantities of sawn lumber, round timber, and fuel produced, the value of the sawn lumber is almost 85% of the total value of the products of the Corps. At the present time, sawn lumber is being produced at the rate of over 1,400,000 feet per day and in order to meet the heavy demands of the Armies for standing gauge and other sleepers in connection with their railway construction programmes over 350,000 sleepers are being produced each week.

Using the Oak Forests.

The main sources of supply of standing timber for this sleeper production are the oak forests of Normandy and Central France, and the immense pine areas of the "Landes," south of Bordeaux. This latter area comprises over 2,000,000 acres of almost flat sand lands, which have been planted with Maritime pine since the end of the 18th century. One of the main sources of supply of sawn timber, in addition to the sources mentioned previously, is the large fir and spruce forests in the mountains of the east of France, in the Department of the Vosges, Doubs and Jura, which are being largely operated by the Canadian Forestry Corps for the French Army. The forests in the former of these Departments are mainly located in mountainous country presenting many difficulties from a lumberman's point of view, and in one case the timber has to be lowered by cable to the mill from a slope of over forty-five degrees.

Logging by Rail

In most of the operations of the Corps, the logs are transported from the stump to the mill by railroad, since climatic and natural conditions do not permit of adopting the usual Eastern Canadian methods of winter hauling over snow or ice roads, and floating by river or lake from the forest to the mill. About ninety miles of railroad are now in use, including short spurs of standard gauge, and long stretches of one metre, three-foot and two-foot gauge track. The cars which are operated by these narrow-gauge railroads have been mainly built by the Corps and various means of traction are employed, including steam locomotion, petrol tractors and horses. In this connection General Stuart points with pride to a petrol locomotive built by his men in No. 2 District Machine Shop within eight weeks time. The engine is from an evacuated Jeffery truck, the differential from a captured Mulhausen (German) truck, and the remainder of the parts from scrap material of all kinds gathered from the dumps, adapted and utilized for the purpose. To prove its efficiency I need only add, that, at the first test, it hauled a load of trucks approximating twenty-one tons.

Lieut. H. R. Christie, who was formerly a member of the head office staff in the British Columbia Forest Branch, in charge of the Department of Operation, has just returned from overseas. He enlisted in one of the field companies of civil engineers and has seen nearly three years service, was slightly wounded, and received the Military Cross. He is at present on his way to join the Canadian Expeditionary Force to Siberia. He was one of Dr. Fernow's graduates.

The cost of fighting fires in the three eastern associations of Quebec, the St. Maurice, the Laurentide and Southern St. Lawrence, has only been \$2,000 in 1918, as against \$15,000 years ago. This is a remarkably good showing.

A New Forest Insect Enemy of the White Birch

By J. M. SWAINE

Chief, Division of Forest Insects, Entomological Branch, Ottawa

A new and highly destructive enemy of the white birch was discovered by us this summer in Quebec Province, and serious injury from probably the same cause has just been reported from another locality.

In the region examined by us the disease was evidenced by many dead white birches, visible in every direction, indicating that the outbreak had been in progress for at least several years. Of the living trees probably over 50% are already badly diseased, and show the characteristic dying branches in the upper part of the crown.

Nature of the Injury.

The injury is caused by a small bronze-black beetle, known as the Bronze Birch Borer, *Agrilus anxius*. The eggs are laid in the bark during June and July. The larvae or grubs excavate long winding tunnels through the inner bark and sapwood of both branches and trunk, and since the mines are frequently very numerous, the sap-flow is checked and the affected portion of the tree may succumb very rapidly. The winter is passed in the larval stage in cells situated in the outer part of the sapwood, and the adult beetles, having developed from the larvae during the following spring, bore half-round holes through the bark and leave the tree chiefly during June and July.

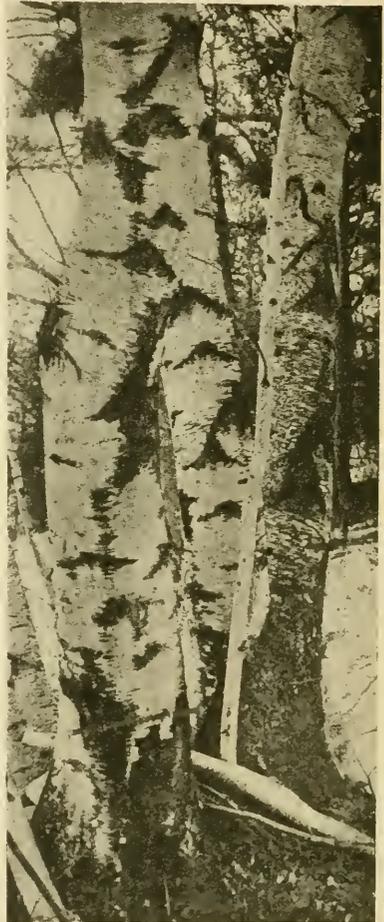
Injured living trees show dying upper branches; when these dead or dying limbs are peeled, the characteristic winding tunnels of the larvae on the surface of the sapwood often form a tangled network.

Extent of the Injury.

We do not yet know how widely the injury is distributed through out the Province, but it is probably of more than local importance. It appears to be spreading rapidly in the section examined: about 50% of the white birches are badly injured and

the remaining healthy trees will apparently be attacked within the next few years.

The Bronze Birch Borer has long been known as the most serious



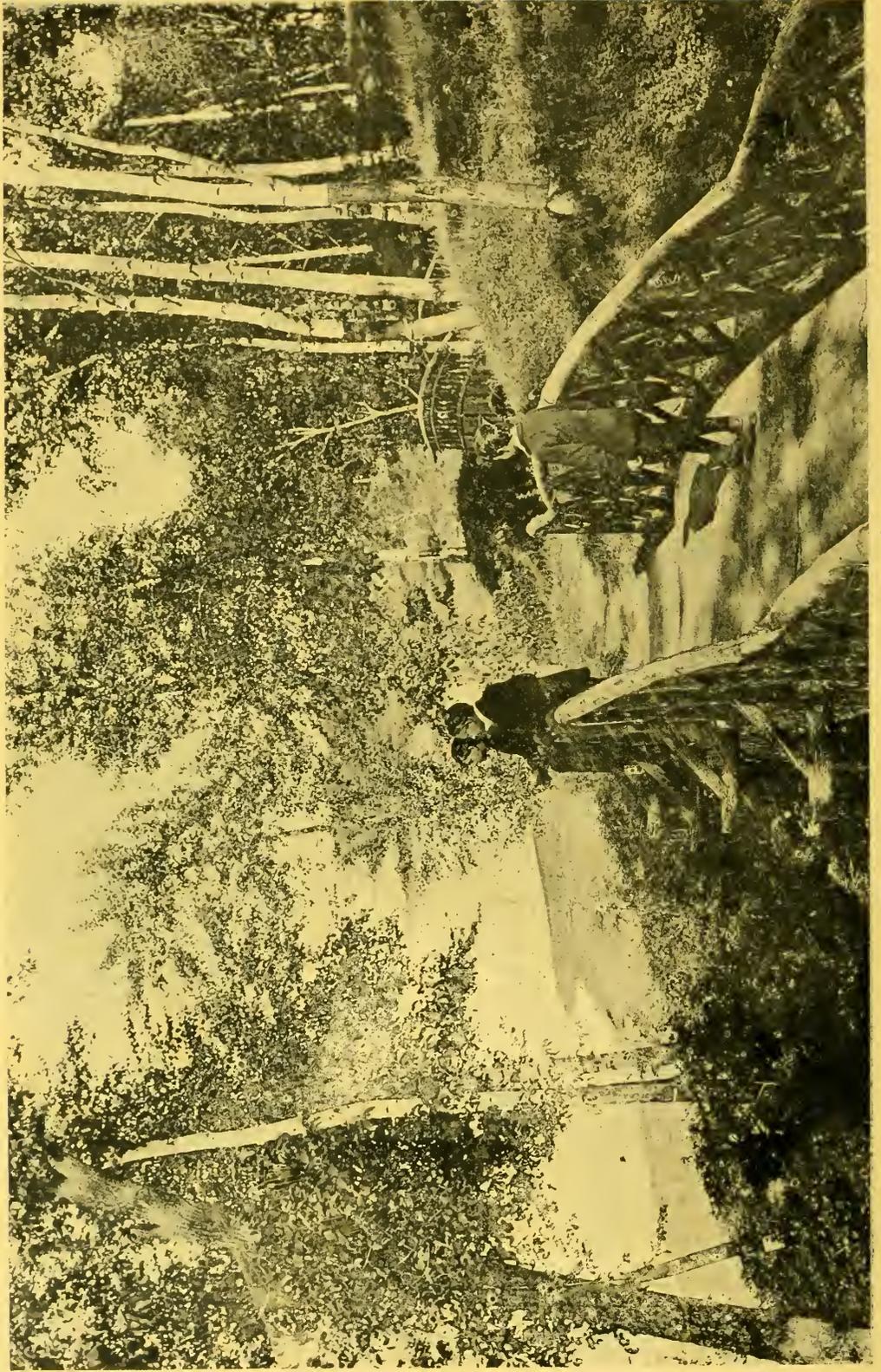
enemy of cultivated birches in the Ottawa Valley and other parts of Eastern America; but, although we have found it breeding in small numbers in wild birches, this is the first instance known to us where it has developed into a really serious forest pest. It is interesting that an enemy



Indian River Drivers in an exhibition stunt at a Canadian summer resort, riding the log half way across the bay.



Picking out a log jam in a Northern Quebec river.



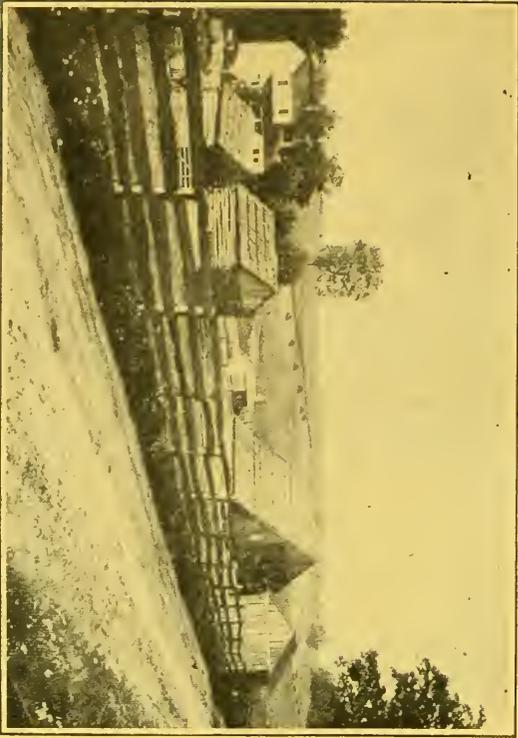
Scene in Rockliffe Park Ottawa



Along the Driveway, Rockliffe, Ottawa

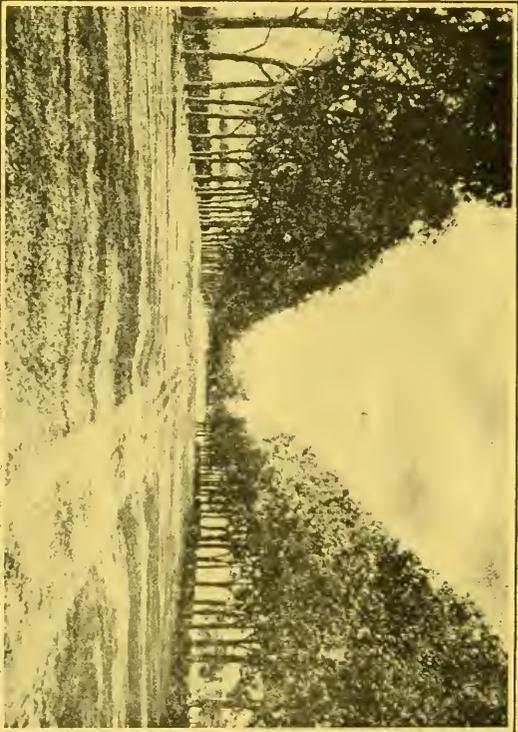


"Royal Shanty," Rockliffe Park, Ottawa



A Common Way of Approaching the Farm

To reach this farmhouse you must drive past a pigsty, corn crib, hen-house, manure pile, and clutter of farm tools. A bad approach gives a bad impression.



The Right Way of Approaching a Farmhouse.

The approach to this farm, is a double row of Black Walnut trees, half a century old, fitting a drive an eighth of a mile long. The trees have not required more than one day's work a year for one man. Considering merely their value as timber, these trees show a profit of 1,000 per cent.

of this kind should appear coincident with the perfection of methods for utilizing birch in the manufacture of pulp.

Control Measures.

The Bronze Birch Borer passes the winter as a larva or grub in the sapwood of the infested trees, and it is conceivable that if all or nearly all the infested trees were marked while the leaves were on, removed during winter, and utilized before June in such a way that the contained grubs would be killed, the remaining healthy trees would have a fair chance for life. This method of control is perfectly feasible on small areas and

should certainly be carried out wherever small holdings become infested but it is obviously impracticable on a large scale under the present conditions of logging birch. There appears to be no other method of checking the spread of the disease. The only recommendation we feel justified in making in this connection is that, since the white birch in a badly infested district are apparently threatened with destruction within a few years, the white birch should be removed and utilized as rapidly as is commercially profitable. The Yellow Birch is not so seriously affected.

The High Mortality of Balsam Fir

BY DR. C. D. HOWE

At Meeting of Woodlands Section, Canadian Pulp and Paper Association

My studies have been restricted to the mixed forests of the hardwood and softwood type, in which the hardwood may form anywhere from fifty to seventy-five per cent. of the stand. So far as the overhead is concerned, the hardwoods are the dominant trees.

You know that it was in these mixed forests that you first began to cut spruce, taking only the largest trees. You perhaps went over these areas twice, cutting spruce saw-logs, and taking away the best spruce and taking away the last time you went over it, fifteen or sixteen years ago, or less, as the case may be, all the spruce down to the twelve inch diameter limit. You see the effect of that. Cutting the spruce successively and leaving the balsam, you constantly made conditions worse for the spruce and better for the balsam. Up to about ten years ago, you did not look at balsam. Balsam was left there and the opening that you made in the crown-cover encouraged its reproduction. Then later you cut out both the spruce and the balsam and that stimulated the growth of hardwoods, and the hardwoods grew up, filled in the spaces formerly occupied by the softwoods, and thus

you converted a mixed forest into a hardwood forest; first by cutting the spruce you gave the advantage to the balsam, and in the past few years you have been cutting a great deal more thoroughly, and you have opened up the crown-cover more, and there again you made conditions very favorable to the balsam reproduction, more so than to the spruce. You go through the forests of the Riordon limits, and the Laurentide limits, and you will be impressed by the abundance of balsam reproduction. You will go through thicket after thicket of balsam, and if you see a spruce tree, it will be a little bit of a suppressed fellow, under the edge of the balsam thicket, or under the hardwoods.

Balsam versus Spruce.

Now, this summer up on the Croche River, I found the reproduction was ninety-seven per cent. balsam, and three per cent. spruce, where the cutting had been chiefly spruce, until a few years ago when the balsam was also cut. Lower down in the St. Maurice Valley, on areas cut over twice for spruce and once for both spruce and balsam, was seventy-five or eighty per cent balsam.

There would be nothing to worry about if we could use balsam, and we could, if it was not for one thing, and that is, the liability of balsam to disease. As you know, this balsam is fearfully diseased. There is a fungus growing on it; there is the heart rot inside of the wood, and inside the bark the beetles are working, girdling the trees. I found in the St. Maurice Valley four thousand balsam seedlings to the acre in this cutover land; when that balsam got to be 8 inches diameter the average was twelve trees to the acre, and seventy-five per cent of them were diseased. This high rate of mortality is probably chiefly due to insect and fungus diseases.

150 Years to Grow Spruce.

Now, if conditions like that prevailed in other regions in Quebec, we could not rely on it, even if we could make paper entirely of balsam pulp—we could not rely on the balsam supply.

There are plenty of young spruce

trees in these mixed forests—little suppressed fellows, but they grow with great slowness. It takes, in these mixed forests, fifty to seventy years to make a spruce tree a little larger than my finger—an inch in diameter, and on the average it will take from one hundred and fifty to two hundred years to make a spruce tree twelve inches in diameter, at the present rate of growth.

That is the condition in the mixed forests, where we have a cover of hardwoods. You may think you are going back there and cut a good crop of spruce. I don't think you are going to cut it at all. The next spruce supply you can cut will not be inside of one hundred and fifty years, if you wait for the present young growth to mature. You are not going to cut much balsam, because it is dying so rapidly, so what are you going to do? What can you do? I would be very glad for some suggestions.

Travelling Lecture Sets in the West

Ready-prepared Illustrated Addresses Now Available to Manitoba, Saskatchewan, Alberta and B. C. Speakers

In response to many requests from Western members, the Canadian Forestry Association is establishing at Winnipeg, Prince Albert, Calgary, Kamloops, and Victoria, five Travelling Lecture Sets for the use of public speakers, school teachers and others desiring to hold meetings for adults or children. So successful have these Travelling Lecture Sets proved in Eastern Canada that benefits quite as notable are bound to ensue from their wider employment in the Prairie Provinces and British Columbia.

Each Set consists of from fifty to sixty lantern slides, mostly in colors, and a complete manuscript, bound in boards, all in a break-proof box. The slides are numbered and correspond to descriptive paragraphs furnished with the lecture manuscript. Scores of school principals, clergymen, etc., have found these Lectures most entertaining and instructive. They have been made quite non-technical, although clearly bringing before the audience the essential points of forest protection and the science of forestry.

By courtesy of the Dominion Forestry Branch and the Provincial Forester of British Columbia the Sets will be established in the government offices so that application may be made direct to the District Inspector of Forest Reserves at Winnipeg, Prince Albert, Calgary and Kamloops, and to the Provincial Forester, Victoria, B.C. for the use of one of these Sets. There is no charge whatever in connection with these Travelling Lectures, except for the small expressage fee necessary to take the Set to and from engagements. Those of our Western members possessing a stereopticon and desiring the use of these Sets between receipt of this Forestry Journal and January 1, 1919, should write direct to the Secretary, Canadian Forestry Association, Booth Building, Ottawa, and after that date to the addresses given above.

Forest Protection in British Columbia

BY CLYDE LEAVITT

Chief Forester, Commission of Conservation

British Columbia is the greatest forest province of Canada. Her forests contain approximately half of the entire stand of saw timber of the whole Dominion, and 24 per cent. of the total stand of the Pacific Northwest. On the other hand, the British Columbia lumber cut in 1913 (the last normal year before the war) was only 13 per cent. of the cut of the Pacific Northwest.

The progressive development of markets, both domestic and foreign, will unquestionably mean a very material increase in the development of the forest industries of the province. That there is ample room for this is indicated by the estimate that the forest resources of British Columbia can, under conservative exploitation, supply at least five times the present cut without seriously depleting the capital stock. The reasonableness of this estimate is at once appreciated when the average lumber cut of 1,250 million board feet is compared with the total stand of saw timber, aggregating some 350,000 million feet. If all the timber suitable for pulpwood be included the total for the province is 366,000 million feet, according to the report on the forest resources of British Columbia, by R. D. Craig and Dr. H. N. Whitford, to be issued shortly by the Commission of Conservation.

The economic importance of this situation to British Columbia and to Canada as a whole is evident when it is realized that British Columbia's forest revenue is already larger than that of any other province of the Dominion, aggregating around \$2,500,000 annually, from provincial Crown timber lands alone. The manufactured value of the primary forest products of the province (such as lumber, pulp, shingles, boxes, piles, poles, mining timbers, etc.), was in 1916 \$35,528,000, when the forest ranked second only to the mines in productive value. During 1917, the forest production increased to such an extent as to bring the total value in excess of the value of the mining output. What the forest would mean to British Columbia and to Canada were the total cut to be increased three, four or five-fold, without impairing the capital stock, may be left to the imagination.

Protection of Young Forest Growth.

It should, however, be noted that these results are predicated upon the basis of what is called conservative exploitation. The most essential feature of such exploitation is protection from destruction by fire, particularly the young forest growth. The report by Messrs. Craig and Whitford, previously referred to, shows that out of a total land area of the province of 353,000 square miles, some 200,000 square miles is incapable of producing forests of commercial value, because of altitude, rock or wet soil, or complete denudation by fire in times past. The actual and potential productive area of the province is thus reduced to 153,000 square miles. Of this only 28,000 square miles, (less than 20 per cent., and aggregating only 8 per cent. of the total area of the province), now bears sufficient timber to be classified under provincial law as statutory timberland. This leaves the enormous area of 125,000 square miles, upon which the stand is less than 8,000 board feet per acre on the Coast, and less than 5,000 feet per acre in the interior. A large proportion of this is land upon which the former forest has been destroyed by fire, and upon which a young forest has since established itself. The protection of this vast area of young forest is absolutely essential if British Columbia is to reap to the full the great benefits which will follow from the full utilization of the possible annual forest increment.

The Coast forests, by virtue of climate and location, are actually and potentially by far the most valuable area for area. It is here, then, that the

most careful attention is justified in connection with the young forest, actual and prospective. In 1913 Dr. C. D. Howe made for the Commission of Conservation, in co-operation with the B. C. Forest Branch, a report upon reproduction of commercial species in the southern coastal forests of British Columbia. The investigation extended over an area of about 1,000 square miles, and the report is contained in "Forest Protection in Canada, 1913-1914," published by the Commission. The report shows that on about one-half of the area logged and burned during the preceding 20 years the forest reproduction is not sufficiently abundant to ensure the re-establishment of the commercial forest. The other half, however, is well stocked with young trees, and, if not burned a forest yielding saw logs is assured. The barrenness, from the standpoint of young trees, on one-half of the logged area is, to quote the author, "due to the occurrence of repeated fires." One burning stimulates the reproduction of Douglas fir—in fact, it is regarded as necessary for the establishment of dense stands; but a second burning is very disastrous, because it kills both the seed trees and the young growth following the first fire. There is nothing left with which to start another crop of trees on the area.

Small Patrol Staff—Heavy Fire Losses.

Now for the application of the foregoing discussion.

War conditions and the financial situation have made it necessary for the British Columbia Government to retrench severely, and in addition, enlistments have been heavy from the forest staff. Consequently, the forest protection work has suffered severely since 1914.

The reports of the Provincial Forest Branch show that in 1914 the temporary staff of forest guards and patrolmen consisted of 391 men; in 1915 this was reduced to 218, and in 1916 to 200. The permanent staff for the same years was 167, 160 and 136, respectively. The report for 1916 states that the reductions brought the patrol staff to a number below safety, very large areas of Crown timber being left entirely without protection, only a fortunately favorable season saving the situation. The same report shows that large areas of valuable second growth were destroyed, particularly in the interior. The report for 1915 states that owing to various unavoidable circumstances fires that year were less strenuously combatted than in any other recent fire season. The fires were fought only where timber merchantable at the present time was threatened, or in cases where a large amount of property, such as cut timber and buildings were endangered. Such a policy, the report continued, is reflected in the size of the fires, these increasing as the patrol staff decreases. The conclusion is drawn that fire-fighting is efficacious and does really reduce the fire damage—a fact which should surely require not even an argument. The inevitable result of such a policy of severe retrenchment in the patrol staff and fire-fighting allotment must be that large areas of valuable young growth will be sacrificed, with consequent serious deterioration in the quality and quantity of the future forest on these lands, as already explained. The fire situation during 1917, and more particularly during the current year, demonstrates conclusively the disastrous results that may logically be anticipated from a policy of letting the young forest so largely take care of itself.

Public Sentiment and Better Fire Protection.

The serious difficulties in connection with the labor shortage and the financial situation are, of course, obvious. So far, however, as the latter is concerned, it is believed that the Provincial Government could well afford to set aside for forest protection a materially larger proportion of the very handsome forest revenue that is being derived, even though it were necessary to raise the rate of taxation to meet the deficit in the amount available for purposes of general governmental administration. The policy that it has been deemed necessary to pursue during at least the past four years means the

sacrifice of a very great future benefit in order to bring about a very much smaller present saving. The Government, however, is dependent for its appropriations upon the state of public sentiment. If there is an overwhelming belief on the part of the public at large that the young forests of the province must be protected, even at the cost of more severe present financial sacrifice, the Government will be able to make the necessary provision. Every citizen of the province is directly interested in this important matter.

With a Forester in a Tank Corps

Lieut. C. H. Morse, a well-known Canadian Forester is now with the Tank Corps at Wareham, Dorset, reverting in rank to secure a place. A breezy letter from his pen reads as follows:

"As you see by the heading I am now in the Tank Corps and have been in this particular camp since the middle of June. There certainly is nothing soft about our work here. It is the hardest sort of physical work and besides that it is extremely dirty. One can't stand upright in a tank, so it is very cramping. It is very hot and dusty. When we quit driving, our faces are absolutely black except for round spots around the eyes protected by goggles. After spending three or four hours in the suffocating atmosphere of a tank one is very glad to get out and get a smoke.

In spite of the disagreeable nature of the work I love it. It is fine to crawl into a tank feeling that you can go practically anywhere. We have huge areas dotted with shell holes and with trenches and wire entanglements. I've never had a machine stuck yet although they pitch about in a most alarming way. When you get a tank perched vertically on its nose or tail it makes you hold your breath as it starts to tip over. The jar isn't really so bad on ordinary soft ground when travelling slowly. When going on top speed through bad holes a man gets rather badly knocked about.

A fortune in Chestnut.

If you could only get a market for some of the "brush" along the Rockies, at what the 10-14 year old Chestnut coppice shoots sell for here, you could be blissfully regardless of whether the Ottawa estimates "went through" or not. "Twelve year sprouts" down in Kent, even before the war, had a stumpage value of \$600. an acre. It is most valuable then, because possessing the greatest number of uses—chiefly for fencing, hop-poles, barrel and tank hoops, faggot-wood, etc. The capital locked up and the care required in this kind of forestry are small, but of course it's a bit hard on the land.

FOREST RESERVES ESCAPE FIRE

*From the Dominion Forestry Branch
"News Letter" Issued at
Calgary.*

Although we have had somewhat dilapidated staff it seems that we can at least congratulate ourselves on getting through so far with a very successful fire season. The Athabasca and Brazeau Reserves seem to have been pretty well favored by weather conditions all through. On the Clearwater, Bow River, Crows-

nest, Cypress Hills and Lesser Slave Reserves, however, there have been very acute emergencies. As previously intimated Supervisor Doucet had numerous fires. On the Bow River, Greenwood had one bad fire to fight in the valley of the Red Deer River. This fire, however, was kept entirely outside the Reserve and was finally extinguished. On the other reserves all fires have been confined to small ones with the exception of the Cooking Lake Reserve where in the spring they had numerous large grass fires.

New Ways in the Woods

BY ELLWOOD WILSON, BEFORE WOODLANDS SECTION, MONTREAL

We have always regarded the forests as mines from which we could draw our timber supply. We never paid much attention to the statement made by the old-fashioned kind of cruisers, that timber lands are producing wood at the rate of three per cent. per acre per annum, and now we know that that statement is one upon which we could not rely for the future. Any cruiser who says that, stamps himself as an ignoramus at the start. They have been making reports which were absolutely absurd. I had occasion to go through a large number of these this spring, scattered from Ontario to the Labrador coast, and they were absolutely ridiculous.

We have to get away from opinions. We have got to get away from the reports of cruisers who paddle up a river and see a certain amount of timber on the banks, guess at the amount, and then go back and make these glowing reports.

We have always regarded the forests as a mine. We have gone on year by year cutting the timber out as cheaply as we could, hoping we could go back and get another cut. We have started logging in the most accessible situations, and we have cut around the edges of lakes and along the banks of rivers and when we have been forced by lack of timber to go farther into the country we have gone. We have areas which are very expensive to log, and in order to prevent going into these areas when labor is scarce and prices high, we have tried to buy accessible timber in other sections, or to buy stumpage or wood from the farmers.

We are practically face to face with a scarcity of timber. Accessible timber is becoming quite scarce and we have to think a minute as to what we are going to do. The price of labor has reached a height which makes it very difficult to operate. The price of provisions is also way up. This has forced us into a position

where we have to think about the future of our supplies.' If this thing goes on year in and year out, the price of paper and lumber will go where nobody will be able to touch it. We all of us know, if we have observed closely in the woods, that the supply of wood is getting pretty scarce. We say we have gone back time and time again over the same areas, that was left in the first instance, but Dr. Howe's report, shows that instead of going back and cutting timber which has grown up in the interval, we were cutting trees which had been left in the first instance. We have gone back and cut smaller timber each time; we cut the pine and we cut the spruce, and a little balsam, and then all the spruce and balsam that was readily accessible. We cannot go on doing this.

When I first came into this country I was told we could go back every fifteen years and get a fresh cut. It cannot be done!

Now to touch upon one or two other points of the logging industry. Owing to conditions over which we have had very little control it has practically stood still. We have not advanced in the same proportion that different processes have advanced in the mills or other industries. We are still logging just about the way we logged when we first went in to this country around 1855 or 1860. Provisions are hauled into the woods in the same way. The camps are not built in the same way because instead of having a big fireplace and a hole in the roof they have stoves, but that is the only change which I have been able to see. The cullers do not live with the jobbers; they have little shacks of their own where they are more comfortable, but speaking generally, we have not changed a bit. We drive a river and build our dams in the same way. We build our tote roads and other roads in the same way, and we still operate

with the same equipment. I don't think there is a new tool in the woods. This is not a proper situation with the growing scarcity of labor. We have to use mechanical means for decreasing the cost of our logging.

Look at the fire protection to-day. When we started in to protect the forests from fire we had men and canoes. Now we have all sorts of equipment, and we are going in one bound to the most advanced mechanical equipment in the protection. You know the talk we have had about aeroplanes for use in fire protection. There is no question that a man with good common sense, as is the man who handles the woods will see the value of aeroplanes in this regard. We will probably be putting out fires with gas bombs before long. That is not foolish, it is something that is entirely possible now.

We can do that same thing now with the woods, but we will have to get some sort of gasoline equipment that will help us out with the heavy labor. We will not be able to get men at the wages we paid in the past. There is only one answer. We have to get out and get some kind of mechanical equipment to saw the trees down; some kind of mechanical transport to get out the timber and some way to drive the logs without such large crews.

Of course, feed has become so expansive that we will have to get away from horses. The motor truck has shown what a poor draft animal the horse is and he will gradually disappear. I am not prophesying, but I am telling you what will happen, and it will happen very rapidly, and we might just as well face the music. We have to turn from men who do things by rule of thumb, or in the our grandfathers did, to the men who are up to the times, and perhaps a little ahead of them.

One thing that has impressed me in the time I have spent in the woods has been the lack of observation on the part of men whose business takes them into the woods, or who have been

practically brought up in the woods—and then have some student from a school come in and call our attention to conditions which we have known about all the time, but never took the trouble to observe. We pass by things over and over again, but do not observe them. We are too busy about something else. We don't observe how much timber there is per acre; how we are going to get it out; how we are going to drive this stream or that stream; conditions in the forest don't mean anything to us. If anybody should ask us how many trees in an acre in the woods on our limits there are very few of us who could give a definite answer.

You all know about the lack of information—definite information—in regard to timber limits. How many men can say how much timber is standing on the limits over which they have jurisdiction? How many men can tell you the proportion of spruce to balsam, or what happens after you cut out the trees in your logging operations excepting that a good many of them blow down amongst those which you leave?

We have got to depend on some people who are trying to observe, like Dr. Howe, in order to find out what the conditions are. Then we have to use our practical judgment and common sense to see how we can devise means to change the situation.

You all know of a case in point, where twelve or fourteen years ago we would not touch the balsam for our paper mills; would not hear of it. Then ten or twelve per cent. used to be allowed (of course a great deal more went in, but nobody knew anything about that) then we allowed twenty per cent., that is the millmen thought they were getting twenty per cent. Then we greatly increased it. The other day the president of a big paper company made the statement that they did not use a stick of balsam in their paper manufacture. He would not hear of it. That is all "tommyrot." He did not know that he was getting balsam. He was so ill-informed that he thought he was getting all spruce.

Time and time again the pulpwood shipments to the United States have been sold as all spruce when there must have been a very large percent-

age of balsam. The Laurentide is using up to 75 per cent. balsam, and I believe we make as good paper as anybody.

The Prop of Our Empire

British Government Stripping 5000 Acres of Timber Each Month for Emergency Uses

London, England, Oct. 15.—The humble bundle of firewood that in pre-war days used to cost one halfpenny has to-day more than doubled in price, for the present penny bundle of wood is little more than half the size of the old halfpenny bundle. Fine timber used in the making of furniture is now costing in some cases four or five times as much as in the early days of 1914. But although these big and sudden increases in price are due to the war, it should be borne in mind that for the past twenty years timber has been steadily rising in value, owing to the ever-increasing demand and the decreasing supplies. The world is cutting down its forests faster than the forests are growing, and unless something is done to counteract the destruction that is going on, there will, in the not far distant future, be a world-wide timber famine.

Nine-tenths of the timber hitherto used by us has been imported. Before the war we were annually importing on an average over 10,000,000 tons (or loads) of timber that cost us \$27,500,000. In 1915 we imported just three-quarters of this quantity, but it cost us \$32,700,000; and in 1916 the 6,319,000 loads we imported had gone up in price to \$40,000,000, so in two years the load had more than doubled in value, having leapt from \$3 to \$7. Incidentally, wood pulp, from which is manufactured, went from, roughly, \$5 to nearly \$12 a ton, which is one reason this magazine is twice the pre-war price.

Russia supplied us with a little

more than half our total wood imports, and Sweden was our second largest source of supply, with a total of 1,759,000 loads. France, Canada, the United States, Norway, Portugal, Germany, Spain, all, in the order named, contributed to our markets until the German submarine campaign compelled the British Government to forbid the importation of wood and concentrate ships upon bringing us food.

Consequently with the wood markets of the world closed to us, we were thrown back upon our own resources, which consisted of 3,000,000 acres of forests and woods. These figures will be better understood when it is known that no other country in Europe is so badly off for forests as is the United Kingdom, for whereas we have only four acres in a hundred under wood, Sweden has forty-seven, Russia has thirty-seven, and Germany twenty-five.

Still, we had to do the best we could with the woods at our disposal so to this end the Home-grown Timber Committee was formed to deal with the matter, and the way the members of that committee have surmounted the manifold difficulties that confronted them is little short of marvellous. When the committee first met, the whole business was in a terrible tangle. Their work was to supply out of British forests the wood necessary for the national needs. But there was no labour and no machinery, and the home markets were absolutely unorganized. Machinery was obtained after a great deal of trouble, and Belgian labourers were

used to reinforce the English labourers. The Belgians, however, did not prove very satisfactory, and they were supplanted after a time by Portugese, who certainly gave better results.

Then came the scheme for utilizing skilled Canadian lumbermen, who were enlisted as soldiers and brought over to grapple with our wood-supply problem. The men were formed into companies consisting of 175 men, and each company was perfectly equipped to tackle any work allotted to it, having its own railway and rolling stock, its steam-saw-mill, horses, and motor-lorries—in fact, everything for getting trees quickly from the forest to the consumer.

At the present moment the Canadian Forestry Corps musters 7,000 men, who are scattered up and down the country in forty picturesque lumber camps. These men are performing wonders; their general organization and their methods of handling trees are a delight to behold, and call for the highest commendation, and their camps have the true Canadian touch about them, the huts being built of split logs, just as they are in the backwoods.

You have only to journey over the countryside to see the inroads they are making on our woods. The famous pine-woods of Surrey are being wiped out of existence, and many of those beautiful spots so near and dear to Londoners may ultimately disappear owing to the urgent call for timber. Whole stretches of what were recently pine-clad slopes have been denuded, and by the end of the war it is doubtful if there will be a single pine of usable size standing in the United Kingdom. The ash too, is falling all over the country, for it is this tree that supplies most of the wood for our aeroplanes. It is reassuring to know we shall have enough ash to supply all our needs, but there will be little to spare and very few sizeable ash-trees unfelled by the time we have beaten the Germans.

As some indication of how our

woods are being eaten up, it may surprise many to know that the New Forest and Windsor Forest alone have supplied three and a half million cubic feet of pine and a hundred thousand tons of pit-props. Very shortly the woods of the United Kingdom will be supplying us with timber at the rate of 500,000 tons a month, or 6,000,000 tons a year! Even then the demand will be greater than the supply; but thanks to our good luck in having been able to import timber for so long, we shall be able to pull through, whereas if we had been compelled to cut down our forests on the present extensive scale at the beginning of the war, they would have been exhausted long ago, and we should have been unable to carry on.

We are only just beginning to realise the vital importance of forests to our national existence and to the existence of the British Empire. We have been in the habit of thinking that our extensive coal-fields made us independent. Far from it, for we must have pit props in order to work our mines, and if pit timber gives out and we have to close our mines, then our whole industry crumbles. Our national existence depends upon coal, which in turn depends upon wood; so if wood fails everything fails, for we have no water-power to draw upon like the Scandinavian countries, no oil-power—no power but the heat which we get from the coal.

These are the unpleasant facts we have to face. The War Office is using 5,000 acres of timber a month, and very little is being done in the way of replanting these cut-down woods. If we were to let the matter rest as it is, our future national existence would be jeopardized. It is imperative that we start to create State forests, and that without delay. Municipal and private enterprise in afforestation must be encouraged. We must have extensive new woods, or else perish.

For thirty or forty years past the apathy shown by succeeding Governments to the question of forestry has been very reprehensible. Various

committees have given their reports, but practically nothing has been done.

The present members of the Forestry Committee have approached the problem in a very able and far-seeing manner, and their suggested scheme should have the active support of every man and woman who has the interests of the nation and the Empire at heart. It is proposed in the first ten years to afforest 200,000 acres of land at a cost of \$3,425,000. Of this area, 150,000 acres will be planted by the State, and the remainder by public bodies. Planting is to continue steadily for forty years at a cost to the State of \$15,000,000. By that time 1,180,000 acres will have been planted, and the State forests will be paying their own way. After that will come the planting of a further 590,000 acres, spread over another forty years.

The aim is to make the United Kingdom self-supporting in timber, so that it will not be necessary for us to buy a single stock from abroad for a period of three years, if the emergency arises.

We certainly cannot do less, and there is no reason why, if the public only realize the important part forests play in the national life, we should not do very much more. We are spending on the war in two days as much as the whole scheme is going to cost us—and \$15,000,000 seems a small sum when we recall that in 1915-1916 we had to pay \$37,000,000 more for wood than we would have paid in normal times, simply because we were in a fix, and were not self-supporting in timber.

We have easily 5,000,000 acres we could afforest—some authorities put the figures much higher—and all would grow fine pine, which is the most important timber from a commercial point of view. It is true that much of this land is now used for rough grazing, but if we planted 2,000,000 acres of it with trees, it would have so little effect on our cattle-raising, that where we grow 1,000 beasts now, we should still be able to raise 995. In addition,

we should have that glorious independence and strength that adequate State forests confer.

Germany, through her foresight, is producing from 50 to 90 cubic feet of timber per acre every year from her State forests, while our woodlands give us only 15 cubic feet per acre a year. It shows what State forests properly managed, can achieve. We can beat Germany in forestry if we set our minds on it.

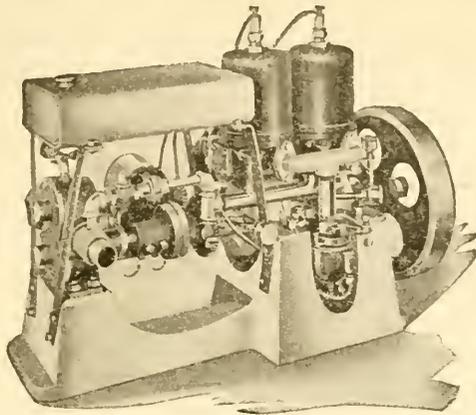
From London. Magazine.

NATURAL RESOURCES AFTER WAR.

At the annual meeting of the Molson's Bank, the president, Mr. William Molson Macpherson expressed the hope that as the end of the war approached the government would be as ready to remove restrictions in the way of the regulations of prices and other ways as the public would be to be free from them, and that "our statesmen in the reconstruction period will show sound judgment, tolerance and breadth of view."

Mr. Macpherson in expressing the opinion that the war would be over by the time of the next annual meeting declared that the period of readjustment would be awaited with some anxiety. "We have, however, every confidence that the exploitation of the natural resources of the country will enable us to return quickly to a normal condition."

"While the pulp and paper trade was expanding very rapidly and Canada was taking a leading position in these industries, largely because of her extensive natural advantages in water powers and forests, the wood was being used in such quantities that the replenishing of the forests by re-planting should engage the attention of the Provincial Governments" said Mr. Macpherson. In connection with the lumber industry he stated that as a result of a scarcity of labor in the woods this winter the output of lumber next year would show a considerable decline and would be largely increased in cost.



FAIRBANKS-MORSE FIRE FIGHTING ENGINES

These compact powerful little pumping outfits have repeatedly substantiated our claims during the past year, all over Canada.

They can be readily transported wherever man or pack horse can go.

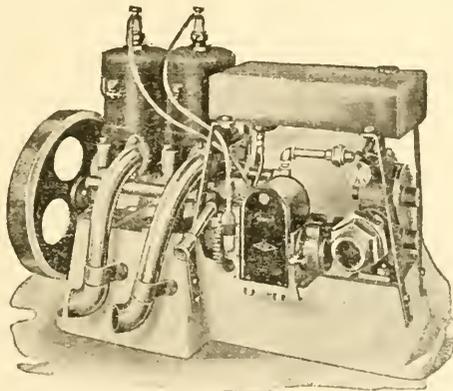
Governments and Private Owners of Forests everywhere, can materially reduce their fire losses by the use of these outfits.

Full information and prices on request.

THE CANADIAN FAIRBANKS-MORSE CO., Limited

MONTREAL - OTTAWA

ST. JOHN, QUEBEC, TORONTO, HAMILTON, WINDSOR,
WINNIPEG, SASKATOON, CALGARY, VANCOUVER, VICTORIA.



The Case for Nova Scotia's Forests

BY ROBSON BLACK

Secretary Canadian Forestry Association

A Province With Rising Wood Costs and Declining Wood Supply---The Remedy!

NOTE:---This article has been issued as an attractive illustrated brochure for free distribution throughout Nova Scotia.

Nova Scotia is essentially a forest province. By that, one does not under-rate other lines of activity or suggest that the forests must flourish at the expense of other provincial interests. The facts are precisely to the contrary. A productive forest trespasses upon no soil desired by the farmer. It has no quarrel with the apple grower, the fisherman, the miner, the shipbuilder, manufacturer, or merchant. To each it supplies essential raw materials. To each its unfailing revenues give stability and confidence. When every citizen shares in the profits of maintenance, when every citizen pays dearly for neglect, the assertion is well justified that forest protection and the cause of Forestry are Community Business.

Facts That Cannot Be Glossed Over.

Apple barrels have increased in cost by 100 per cent. in the Annapolis Valley during the past four years. Wood materials for fishing boats, boxes, barrels, sheds and houses record a painful advance in price. Pit props for the coal mines are scarcer and much dearer. Western Nova Scotia lumber mills that were able to export 25 per cent. of a cargo in 12" lumber, fifteen years ago, were forced to reduce the proportion of bigger lumber to 10 per cent. during the succeeding ten years and today are shipping out cargoes in which the larger timbers are inconspicuous. The significance of these facts to Nova Scotia's export trade is at once obvious. The scarcity of larger timber and its increasing inaccessibility in certain sections places a handicap upon the ability of provincial lumbermen to sell to the United States, West Indies, South America or the United Kingdom. The class of timber in greatest demand cannot now be delivered as formerly. This obviously ties the hands of the exporter. Industrial re-organization cannot remedy it, for the root of the trouble is in the Nova Scotia forest. The big timber simply is not there in quantities or locations to justify operating. The whirling saws of Western Nova Scotia mills do not in themselves create wealth. They give new utility and market value to the raw materials of the forest. Where the forest fails to support the mill, the mill is as useless as a disconnected turbine.

Nova Scotia's Future Depends On This

Export trade in forest, farm and sea products is the main hope of large provincial development. It is the magnet to new population, the trump card in the vastly keener competition of post-bellum days when Nova Scotia must either send superior goods, produced at low cost, to foreign shores or find foreign-made goods battling home products out of its home market.

Wood products in themselves form a chief item of present export, capable of vast development. Forest depletion not only negatives the growth of Nova Scotia lumber and pulp mills, but must pull down to mediocrity the wooden ship building industry and its expectation of home cargoes. It does more than that. The ability of the apple grower to sell abroad profitably depends upon his ability to produce cheaply. If he cannot obtain coeprage material or can obtain it only at high cost, his importance as an exporter is diminished to that degree. So with the fisherman.

The present condition of the Nova Scotia forests, taken as a whole, in-

ANOTHER EXPLANATION REGARDING SPRUCE

Portland, Ore., Oct. 19.—Selective logging costs four times as much as the ordinary commercial kind. That's why even a well-informed lumberman may be excused if he wonders at the high price of spruce used by the United States Government in the manufacture of the myriads of flying machines with which the allied armies are smothering the barbarians of Europe.

It is said that spruce cut and shaped into the wing beams and struts that go into the construction of an airplane represents an outlay of about \$500 a thousand feet. To any one who has the time and the inclination to visit the spruce woods of Oregon and follow the trail of the airplane stock from its native tree thru the various stages of its evolution until it finally is built into the winged death to Germans at the big eastern factories the only astonishing thing is that the ultimate cost is not greater.

Take the logging operations for example. Down in the heart of the greatest spruce belt in the world near the shores of a little Oregon bay is the headquarters of one of the big logging projects of the spruce production division of the United States Army Signal Corps. Under the supervision of the Government the Warren Spruce Co. operates this project which has since February furnished Uncle Sam with more than 7,000,000 feet of the highest grade airplane stock that grows. Preliminary to the actual logging out process the company had to spend an immense sum in buying locomotives, flat cars, donkey engines, steel rails, tools and equipment. A main line railroad seven miles long had to be graded over a rough piece of country and before a rail could be laid more than 8,000 feet of expensive piling had to be driven, the timber for this being cut and hauled out of the woods along the right of way.

A PAPER RACE TRACK.

New York, Oct. 31.—This year's international six-day bicycle race at Madison Square Garden, the week of December 1-7, may be held over a paper track. A well-known manufacturer has made a proposition to lay a track such as has been in use in Paris for several years. It is said a paper track has more durability than a wooden course, and insures better speed. The cost, too, is much less. Indeed, a papier mache track would revolutionize six-day racing. The inventors promise a demonstration before November 10. Right now it is only a question of procuring the material. A ten-lap track will require about 40,000 square feet of material. It can be built in sections, and can be put together in about five hours. It takes about forty-eight hours to lay a board track, which becomes worthless after a race.

A TYPICAL B. C. LETTER.

Jessica, B.C., Sept. 21, 1918.
Canadian Forestry Assoc:

It is with the greatest pleasure that we accept membership with you and assure you of our hearty support and co-operation in any movement you make to protect our timber from the ravages of forest fires. We, too, believe it to be the duty of every lumberman in Canada to identify himself with your association.

Wishing it all the success it deserves

Yours faithfully,
Fir Tree Lumber Co.

COL. DENNIS TO SIBERIA.

Colonel John S. Dennis, C.M.G., President of the Canadian Forestry Association, has been appointed Canadian Red Cross Commander for Siberia. Col. Dennis, is familiar with conditions in Siberia, from residence both in Northwest Canada and Russia, where he is a member of the Russian Investment Company. For the past fourteen months he has been second in command of the British-Canadian Recruiting Mission in the United States.

dicates a progressive decline. Fires have taken a monstrous toll of what originally was an endowment of incalculable worth. To be sure, the *cutting* of timber was not managed on a principle of continuous reproduction, but fires undoubtedly have been the chief degenerative factor. Had fires been debarred by modern protective means and by cultivation of a conservation sentiment amongst persons who cause the fires, there is no doubt whatever that lumber mills instead of reducing activities would have added to plant and to number of employees, developing their towns, providing new demand for farm and fisheries products and taking more vigorous hold of export trade opportunities. There is, of course, small satisfaction in basing a forecast upon impossible premises. The original forest wealth of Nova Scotia has largely been forfeited. Today not more than 100,000 acres of virgin forest remain. Two-thirds of the forest area has changed from the precious pine spruce and hackmatack, on which the modern mill exists, to the secondary hardwoods which form a minor item of commerce. This is the unfortunate situation of the permanent timber crop covering about *eighty per cent.* of the entire provincial area. As that eighty per cent. is non-agricultural, the greatest problem now facing the people of Nova Scotia is to block the forces that are leading the main portion of the provincial estate to the edge of ruin and then to institute such measures as will hasten its restoration. No question that can possibly confront Nova Scotians has more than a fraction of the urgency associated with this enterprise of repairing the forest foundations that uphold the walls of prosperity.

An Opportunity To Double The Timber Yield.

"Here is a natural resource," states Dr. B. E. Fernow, director of the Nova Scotia Forest Survey, "capable, under proper management, of forever producing by annual increment, as interest, at least twice as much as is now being cut from capital stock."

The Forests of Nova Scotia, in Dr. Fernow's estimate, represent a potential capital of at least \$300,000,000. And yes, "it is now largely in poor condition and is being annually further deteriorated by abuse and injudicious use."

This is Public Business!

It is to the State we are compelled to look for initiative and continuity of policy in the care of forest lands. The long time-element involved in the maturing of timber crops is constantly at war with the natural human desire for "present profits." The latter consideration, however, is properly divorced from the function of governments. In nearly all well-organized lands, the public administrator is regarded as the natural custodian of the forest properties—most easily destroyed of all the material resources. The Nova Scotia of 1979 is to a considerable extent in the hands of the Government of 1918. If the forest possessions are not husbanded today, there will be no tomorrow in which to husband them.

What Other Governments Are Doing.

What are other Governments doing to maintain their forests?

New Brunswick last year created a new Forest Service, at the head of which is a Provincial Forester and a staff of technically-trained Foresters and fire rangers. The service will cost New Brunswick about \$100,000 a year but will repay the cost many times over.

Quebec has a Forest Service, with a Provincial Forester and more than forty technically-trained assistants, besides a splendidly-organized set of "forest protective associations" which are rapidly subduing the plague of forest fires.

Ontario has a Provincial Forester, with more than a thousand fire rangers and inspectors, costing \$500,000 a year. And it pays!

The three prairie provinces are under the Dominion Director of Forestry, with a large staff of subordinates, engaged in fire prevention.

British Columbia has a strongly-organized Forest Service with a Provincial Forester and a group of District Foresters and rangers.

Nova Scotia Legislature Endorsed Provincial Forester.

What of Nova Scotia?

Nova Scotia has no Provincial Forester, although the need of such an organizer and authority is quite as acute as in British Columbia or New Brunswick. That such an officer is essential to the province was recognized by legislation passed in May 1913, providing for his appointment.

What would be the duties of a Provincial Forester in Nova Scotia?

1. To properly organize and develop the present fire ranging, Nova Scotia has excellent legislation already in plan, an existence for prevention of forest fires and the forested areas are so located as to make fire protection relatively easy. What is required, therefore is that the existing legislation should have thorough and expert application. Only a technically-trained Forester can accomplish this.

The natural rate of forest growth in Nova Scotia is so favorable that, with fires excluded, restoration of the timber values must take place over very large areas.

2. The day of haphazard lumbering is over in all parts of America. While the virgin forest remained, the incentive to conservative lumbering was anything but imperative. Now the virgin forests of Eastern Canada are mostly cut out. The pulp and lumber companies are reaching out for technical guidance in the management of their forests so as to perpetuate the supply and save their huge investments. To assist with expert counsel the Provincial Government in the management of the remaining Crown lands and to co-operate constantly with the private woodland owners, whether mill operators or farmers, would be another important part of the Provincial Forester's duties.

The Power of Education in Forest Guarding.

3. To this officer would naturally fall a third highly important function which is surely a government's function—to campaign against carelessness with fire. The 'average man' who leaves his camp fire burning or throws away lighted matches and cigarettes is not malevolent by intention. He merely does not "think" because amongst all the impressions he gathers in a day's journey he may never encounter a suggestion that camp fires cause great forest conflagrations. The act is not mentally associated with the idea of vandalism. Educational propaganda against forest fires, tackles this 'average man' by skillful appeals to common sense and selfish interest. It is to forest protection as hygiene in disease prevention. It modifies the careless attitude, puts out the *match* before a hundred rangers are asked to put out the *holocaust*.

A Provincial Forester in Nova Scotia, by public meetings, lectures, work in the schools, newspaper publicity, distribution of literature, etc., can do a remarkable service in the provincial interests.

Cut Down Railway Fires By Co-operation.

4. Yet another most valuable consequence of the appointment of a Provincial Forester for Nova Scotia would be the lessening of timber waste from forest fires caused by the railways. As has been true in all forested provinces of Canada, the task of guarding against fires set from railways requires special organization and unremitting vigilance.

Since the Dominion Board of Railway Commissioners undertook the direction and supervision of railway fire protection in 1912, the destruction of timber areas contiguous to the private-owned railway lines has materially lessened. In the case of the public-owned railways, (not under the Board's jurisdiction), co-operative arrangements have in some cases been worked out, usually through the provincial governments, by which patrol work and right-

of-way clearing and inspection of smoke stacks and ash pans on locomotives have been developed with excellent results.

The Dominion Board of Railway Commissioners, however, has worked largely through existing forestry organizations, as in Ontario, Quebec, New Brunswick, British Columbia, and on Dominion lands in the West, conferring upon certain of the forestry officials a special authority, as inspectors for the Board, to check up the fire protection work of the railway companies.

In Nova Scotia, however, there is no special provincial forestry organization, and no Provincial Forester. The Railway Board, therefore, has been unable to extend the benefits of its railway fire inspection to the railways of the province to the fullest extent because its own immediate staff is inadequate to provide the necessary degree of close and continuous inspection required for the best results.

Should Nova Scotia follow up the legislation it has already adopted and appoint a Provincial Forester, that officer would immediately be constituted a representative of the Dominion Board of Railway Commissioners for purposes of railway fire Protection, with all the authority that goes with such designation.

The Board of Railway Commissioners, however, is handicapped to a certain extent in securing improved results in railway fire protection by the lack of a local inspector. This lack could be most readily and logically supplied as an incident to the appointment of a Provincial Forester, with resulting benefit to the business interests of the province in general.

Benefits Suspended Until Province Appoints a Forester.

It is but just to recognize that the railways in Nova Scotia have shown an interest in forest protective work and have issued excellent instructions to their employees dealing with fire prevention. No doubt the latter have had effect, but experience has shown that railway employees closely engaged on duties directly connected with their positions cannot be expected to give fire protection as much attention as if they were in personal touch with a special inspector.

CLASSIFICATION OF NATURAL RESOURCES WITH REFERENCE TO THEIR POSITION AS REGARDS STATE CONTROL

By A. C. Thrupp

Forest School, Univ. of Toronto

The Resources of a country may be put under four headings. The first is:

1. Resources inexhaustible.

Under this heading there are not many. Air, salt from the sea, stone, sand, gravel, clay, limestone and water in a certain sense.

Sand, gravel and clay may be considered as being deposited or manufactured by nature much faster the man could use them. The state need have no concern about them for the future as likewise with stone as man can but nibble at the supplies of the latter in the world. Water is a resource which man can only alter in its seasonal distribution so it can

be taken as a perennially permanent resource.

2. Resources exhaustible and non-restorable.

Coal is the most important resource under this heading. All that the State can do to prolong the supplies, is to prevent waste in mining and use; and to encourage the use of restorable substitutes as wood and water power. Of Oil and natural gas the same may be said. Other resources under this heading are the mines of gold, silver, copper, iron and many other minerals. They are exhaustible in the fullest sense and forever gone when once used up.

3. Resources restorable but liable to deterioration under uncontrolled private activity.

Resources under this heading may be put into two divisions.

(1) Resources which can deteriorate so far as to be totally impractical or absolutely impossible to restore. These resources are game.

Useful Forestry Books

FERGUSON—FARM FORESTRY

By John Arden Ferguson, A.M., M.F., Professor of Forestry at the Pennsylvania State College. VIIIx241 pages. 5¼ by 8. Many full-page half tones. Cloth, \$1.25 net.

Covers especially the subject of forestry as applied to the farm and woodlot. The subject is treated from the broad standpoint of the woodlots in the great plains and prairie regions, as well as in the more eastern regions.

KINNEY—THE DEVELOPMENT OF FOREST LAW IN AMERICA

By Jay P. Kinney, A.B., LL.B., M.F., Chief Supervisor of Forests, United States Indian Service. XVIIIx275 pages. 6 by 9. Cloth, \$2.50 net.

This book discusses the chronological development of legislation directed to the preservation of existing forest resources, reforestation of cut-over, burned-over areas, the extension of forest areas, and the systematic management of forests for productive purposes.

KINNEY—THE ESSENTIALS OF AMERICAN TIMBER LAW

By Jay P. Kinney, A.B., LL.B., M.F. XXIXx279 pages. 6 by 9. Cloth, \$3.00 net.

This book contains information that will prove of inestimable value to anyone who desires to ascertain easily and quickly the fundamentals of American timber law, or who needs reference to court decisions to support a well-founded view as to the law upon any particular point.

WOOLSEY—FRENCH FORESTS AND FORESTRY. Tunisia, Algeria and Corsica. With a Translation of the Algerian Code of 1903.

By Theodore S. Woolsey, Jr., M.F., Assistant District Forester, United States Forest Service, 1908-1915. XVx238 pages. 6 by 9. Illustrated. Cloth, \$2.50 net.

Embodies the result of a study of the more important phases of forest practice in Corsica, Algeria and Tunisia. The author's experience abroad includes not only continental Europe and the French Dependencies (which latter are described in this book), but also forest management in British India as well.

BRYANT—LOGGING. The Principal and General Methods of Operation in the United States.

By Ralph Clement Bryant, F.E., M.A., Manufacturers' Association. Professor of Lumbering, Yale University. XVIIIx590 pages. 6 by 9. 133 figures. Cloth, \$3.50 net.

Discusses at length the movement of the timber from the stump to the manufacturing plant, and the chief facilities and methods for doing this; with especial reference to logging railroads.

TAYLOR—HANDBOOK FOR RANGERS AND WOODSMEN

By Jay L. B. Taylor, Forest Ranger, United States Forest Service. IXx420 pages. 4¼ by 6¾. 236 figures. Flexible Binding, \$2.50 net.

Prepared as a result of the author's experience in field work of the United States Forest Service. Solves problems which confront a forest ranger in government, state and private employ. The suggestions offered will also be found of use to others whose work or recreation takes them into rough or unsettled regions.

THE UNIVERSITY OF TORONTO

AND

UNIVERSITY COLLEGE

WITH WHICH ARE FEDERATED

ST. MICHAEL'S, TRINITY and VICTORIA COLLEGES

Faculties of

ARTS
EDUCATION

MUSIC
APPLIED SCIENCE

MEDICINE
FORESTRY

Departments of

HOUSEHOLD SCIENCE

SOCIAL SERVICE

For information, apply to the Registrar of the University, or to the Secretaries of the respective Faculties.

fish and the various animal products that man uses. The species that provides the resource can be made extinct or so rare that it ceases to be of any use and couldn't be restored in hundreds of years. The passenger pigeon and buffalo of N. America are two of these; they were resources but are not now, and cannot be restored. The whaling industry is going the same way, and ivory trade may follow. Many other instances can be found.

(2) Resources which are usually restorable, i. e., the *forests* and the waterpowers which are dependent upon them. The forests are in most cases restorable though frequently not to their former value for instance, a white pine forest cannot be practically restored again over large areas in Eastern North America, owing to the complete burning of all the vegetable matter which made the soil on the rock. Some species may be able to grow here but not the valuable white pine; in those cases the resource of the white pine forest is gone. On the other hand in deep

P. L. BUTTRICK

CONSULTING FORESTER

NEW HAVEN, CONN., U. S. A.

P. O. BOX 607

TIMBER ESTIMATES

UTILIZATION STUDIES

PLANTING PLANS

Landscape and General Forestry
Work.

Eight years experience in practical
forestry work of all sorts.



Dry Matches

After all day in a boat, rainstorm or wet snow. Ask your dealer for

MARBLE'S WATERPROOF MATCH BOX

If he can't supply you, we will send prepaid for his name and 50 cents. Dry matches may save your life.

MARBLE ARMS MFG. Co.

Dept. 5160

Gladstone, Mich., U.S.A.

CONFEDERATION LIFE

ASSOCIATION UNCONDITIONAL ACCUMULATION POLICIES

Are liberal up-to-date contracts which guarantee to the insured every benefit consistent with safety.

Write for Particulars

which will gladly be furnished by any representative of the company or the

HEAD OFFICE, TORONTO



QUEEN'S UNIVERSITY

KINGSTON
ONTARIO

ARTS MEDICINE EDUCATION APPLIED SCIENCE

Mining, Chemical, Civil, Mechanical and
Electrical Engineering.

HOME STUDY

Arts Course by correspondence. Degree with
one year's attendance.

Summer School **Navigation School**
July and August. December to April.

GEO. Y. CHOWN,
Registrar.

MINIATURE CONSTRUCTION

Landscape, Mechanical and Architectural Models, Topographical Maps and Paintings. for

SCHOOLS — COLLEGES — MUSEUMS
Government work a specialty

MORGAN BROS. CO., Inc.
MODEL MAKERS

Room 1650 Grand Central Terminal
Phone 7720 Murray Hill

NEW YORK CITY

UNIVERSITY OF NEW BRUNSWICK

FREDERICTON, N.B.

DEPARTMENT OF FORESTRY
Established in 1908

Best of facilities for definite instruction and supervision in Practical Forestry.

Surveying, cruising and construction work carried on in our own tract of 3600 acres, with Forestry Camp in the centre.

Competent men from the School at present in demand to take up Forest Survey work with the Provincial Crown Land Department.

For further information address :

DEPARTMENT OF FORESTRY

University Calendar furnished on application.

C. C. JONES, Chancellor.

R. O. SWEEZEY

(B. Sc., M. E. I. C.)

Water Powers. Timber Lands.

FINANCING

164 St. James St. MONTREAL.

mineral soils the forest is always restorable. Therefore the State's duty is to see that the forests are not *destroyed* forever, but *used* forever, and this is best done under *State ownership*. The Water powers of the streams need not be entirely under state ownership but it would be best for the most economical use of them, that the state store and regulate the flow on rivers and streams on which power is developed by public utilities or private use.

4. Resources restorable, yielding increased returns under increased activity.

Under the head come all the products of the labour and brains of man as wealth, knowledge and other fields of progress due to either private or state activity.

The soil is certainly a valuable resource, and under *intelligently* increased activity it most certainly yields greater returns. As it is a short time investment it thrives under private activity and the

State's relation to it need only be one of an educational adviser and a leader in experiment and progress. On the other hand it can deteriorate under mismanagement but very rarely so far that it cannot be restored.

REFORESTING FRANCE.

In a note from France to his father, Mr. D. B. Detweiler, of Kitchener, Ont., Lieut. Detweiler refers to the recent interesting transfer of the Snider woodlands in Waterloo County to the care of the Ontario Forestry Branch.

"Mr. Snider of Conestogo has the proper view of things. If some of our wealthy farmers followed his lead it would be a wonderful thing for the future of our Province. Reforestation is the one big idea in France, and even at the present time the Government is preparing and planting vast forests. Only yesterday I attended a banquet given in honor of the visit of the Civil and Military Chiefs of Forestry in France.

50^{CTS.}

WAR TIME SPECIAL OFFER

ONE WHOLE YEAR
FOR FIFTY CENTS!

We are desirous of adding 1,000 new names to our list this month and to make it a certainty that we will not be disappointed we are offering

ROD AND GUN

IN CANADA

to you and 999 others for Twelve Months for 50 cents.

W. J. TAYLOR LIMITED, Publisher - Woodstock, Ont.

TREES, SHRUBS AND SEEDS

Hardy Northern Trees and Shrubs at Lowest Prices. Native and Foreign Tree Seeds

EDYE-DE-HURST & SON, DENNYHURST

DRYDEN, ONT. Shippers to H. M. Government, Etc. Correspondence Francaise.

Hill's Seedlings and Transplants

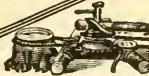
ALSO Tree Seeds for Reforesting. Best for over half a century. Immense stock of leading hardy sorts at low prices. Write for price list and mention this magazine.

Forest Planters Guide Free.

The D. Hill Nursery Co., Evergreen Specialists
Largest Growers in America.
Box 503 Dundee, Ill., U.S.A.

Try This Stump Puller at Our Risk

The Smith Stump Puller will take out every tree and stump by the roots, clearing from one to three acres a day, doing the work of twenty men. We want you to send for our 3 year guarantee against breakage and our free trial proposition. Address
W. Smith Grubber Co.
31 Smith Sta.
LaCrescent, Minn.



YALE UNIVERSITY FOREST SCHOOL

NEW HAVEN, CONNECTICUT, U.S.A.

YALE University Forest School is a graduate department of Yale University. It is the oldest existing forest school in the United States and exceeds any other in the number of its alumni. A general two-year course leading to the degree of Master of Forestry is offered to graduates of universities, colleges and scientific institutions of high standing, and, under exceptional conditions, to men who have had three years of collegiate training including certain prescribed subjects. Men who are not candidates for the degree may enter the school as special students, for work in any of the subjects offered in the regular course, by submitting evidence that will warrant their taking the work to their own advantage and that of the School. Those who have completed a general course in forestry are admitted for research and advanced work in Dendrology, Silviculture, Forest Management, Forest Technology and Lumbering. The regular two-year course begins the first week in July at the School camp, Milford, Pennsylvania

For further information address
JAMES W. TOUMEY, Director
New Haven - Connecticut

Gagnon & Morissette

Lumber Contractors
Timberland Cruisers
Forest Industries

CHICOUTIMI, P.Q.

LT.-COL. L. J. D. MARQUIS

Forest Engineer and Mem. Can. Soc. of F.E.;
Quebec Assoc. of F.E.; Former Mem. Que. F. Service

Forest Cruising and Mapping
Timber Factors and Logging Costs
Facts on Forest Growth and Future Products

90 LOCKWELL AVENUE, - - QUEBEC

R. R. BRADLEY

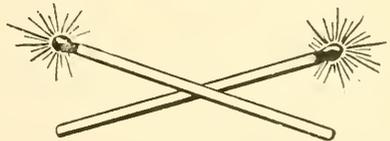
Forest Engineer and Mem. Can. Soc. of F. E.
Consulting Forester to the New Brunswick Railway Co.

Timber and Pulwood Estimates. Forest Maps. Advice on the Management of Wood Lands. Timber lands listed for sale.

GLOBE ATLANTIC BUILDING, ST. JOHN, N.B.

Or P. O. Box No. 5, OTTAWA, Ont.

ASK FOR



PHILLIP T. COOLIDGE FORESTER

Timber Estimating and Mapping.
Supervision of Lumber Contracts.
Surveying. - - Forest Planting.

STETSON BLDG., 31 CENTRAL ST.
BANGOR, MAINE.

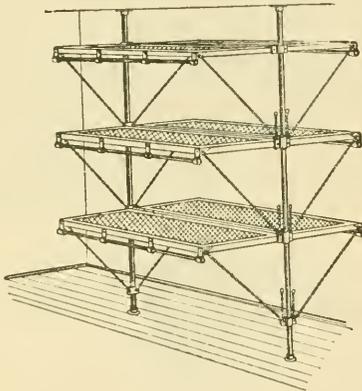
The Canadian Forestry Association's Exhibition Car was badly smashed in a head-on collision at Springhill, Nova Scotia. In the car were a large number of exhibits demonstrating methods of forest protection, such as model aeroplane, model lookout towers, a Marconi wireless set in operation, forest telephones and many other interesting objects. These were badly thrown about but serious breakage was relatively small.

At Moncton through the courtesy of the Canadian Government Railways Management, the contents of the car were transferred to a new coach which was taken to Quebec City for a run through the Lake St.

John country and central Quebec. About that time the influenza epidemic arrived and closed down all public meetings. The Exhibition Car, however, will continue on its way until the winter season sets in in earnest.

The Association hopes to send out a Car early next Spring with a much more elaborate equipment than was possible in this year's experimental stage.

Col. J. S. Dennis, President of the Canadian Forestry Association has been chosen by the Canadian Government as a member of the Commission which will have charge of the Dominion's Commercial interests in Russia.



STEEL BUNKS FOR CAMPS

Included in the well-known line of DENNISTEEL factory, hospital, camp and ship equipment is the all-steel sanitary bunk illustrated. Take up very little room, are comfortable, hygienic and practically indestructible—a permanent investment. Write for particulars and folders on any of the following lines:

Steel Lockers, Bins, Cabinets, Chairs, Stools, Etc.
Standardized Steel Shelving (knock-down system).
Steel Hospital Equipment. General Builders' Iron-work.

Ornamental Bronze, Iron and Wirework.
Wirework of every description.

THE DENNIS WIRE AND IRON
WORKS CO. LIMITED

LONDON
CANADA

Halifax Montreal Ottawa Toronto
Winnipeg Vancouver

The Paper For People Who Would Really Know

Those who are reading **WORLD WIDE** week by week are finding themselves **better informed** as to the thought and doings of these momentous times than those who merely depend on the Daily press; for in **WORLD WIDE** is presented the well considered thought of those who concern themselves with the **inner meaning** of things rather than with their passing appearance. In **WORLD WIDE** you will find assembled just a few of the **really noteworthy** articles of the week, selected from the most responsible British and American journals and reviews—care being taken to have different points of view represented. Many of these articles have been written or inspired by the **great men of the times**. Sample copies **FREE**; or for five weeks trial for ten cents in stamps, or fifty cents on trial to end of 1918 to new Subscribers. (Regular subscription rates \$2.00.) **JOHN DOUGALL & SON**, Publishers, Montreal.

An Open Letter to Members!

To take up a gun—
—and get into step—
—and drill and march—

is one way, and a great way, of doing Canada a service.

But when a busy man—
—quietly turns to his neighbor—
—and says: "Join the Forestry Association"

He is doing a patriot's work in direct support of the man with the gun.

Hundreds of our members the last month or so, have gone to a little trouble to recruit a new supporter of the Forest Conservation Movement.

And hundreds haven't.

They have said, "I haven't time," little knowing that the Canadian Forestry Association gets most members from the rushed-to-death executive, the business man whose minutes are worth dollars.



We ask you to score a New Member to your credit today. As a special inducement we will mark his membership and subscription paid up until December 31st, 1919.

BUT, to be a member of the Association means far more than subscription to the Forestry Journal. The latter is an incidental to membership, but we intend to make it a more attractive incidental during the remainder of the year.

Canadian Forestry Association
Booth Building, Ottawa.

Not affiliated with any government or commercial interest.



How About Operators?

Prospective users of wireless usually ask us: "But what about operators? Aren't they hard to get?"

The answer is: "Not if you use C & W apparatus."

The old style sets, with their high voltage, low factor of safety and numerous critical adjustments, could be operated only by an expert, with a specialized training,—and such men are hard to get.

But C & W sets have a voltage of only 200 volts as against from 8,000 to 20,000 volts in the old style sets, a factor of safety of ten as against one and a half, and no critical adjustments. These factors make a set so simple, rugged, reliable and easy to operate that anyone who knows the code can operate C & W sets and keep them in operation—and learning the code is a simple matter taking from four to six weeks. If C & W sets are installed in your forests, your wardens can operate them after a short training.

No C & W set has ever broken down in service; the initial cost of a C & W set is about one quarter that of other sets on the market; the upkeep costs are almost negligible; and you can always get operators for C & W sets among your own men.

May we help you solve your problem?
Details and expert advice from our
engineers upon request.

Cutting & Washington, Inc.

1083 Little Building - BOSTON, Mass.



Canadian Forestry Journal

Vol. XIII

DECEMBER, 1918

1918

No. 11



PORTAGE INLET, VICTORIA, B.C.

FACULTY OF FORESTRY

JAN 15 1919

UNIVERSITY OF TORONTO

TENTS IN EVERY STYLE

May be had made up of
the celebrated



Write for Samples and Prices.

The Woods Manufacturing Co., Ltd.

FORMERLY SMART-WOODS, LTD.

OTTAWA - TORONTO - MONTREAL - WINNIPEG

FOREST TELEPHONES



Make the life of the forester better worth living. They relieve him from the appalling loneliness. They help him to keep in human voice touch with foresters miles away.

In emergencies—fire—sickness—hunger—the speed with which they can summon help is marvellous.

Write for full particulars of how to install the Northern Electric Forest Telephone System. Address the Office nearest you.

Northern Electric Company
LIMITED

Montreal
Halifax
Ottawa

Toronto
London
Winnipeg

Regina
Calgary
Vancouver

Northern Electric Forest Telephones

Canadian Forestry Journal

CIRCULATION 7500 COPIES MONTHLY

ROBSON BLACK, Editor.

Vol. XIV.

WOODSTOCK ONT., DECEMBER, 1918

No. 11

CONTENTS FOR DECEMBER

-
- “Building a Canadian Aeroplane.”
 - “The Aeroplane in B. C. Forests.”
 - “Women a Success in Planting Work.”
 - “Do Forests Increase Rainfall.”
 - “The West Asks for Its Forests.”
 - “British Aid for Research Enterprises. ”
 - “Central Institute for Research.”
 - “Labor and Capital Favor Research.”
 - “Hydroaeroplane for Forest Protection.”
 - “The History of Familiar Trees.”
 - “Canada’s Tree Farm of 250 Million Acres. ”
 - “France’s Profit From Forestry.”
 - Forestry and Imperial Safety.
 - Air Fighters for Timber Guarding.”
 - “A Forestry Mosaic of British Columbia.”
 - “The Fire Fiend’s Work on the Pacific Coast.”
 - “Where the Forest Dollar Goes.”
 - “New Brunswick to the Fore—and Why.”
 - “Nova Scotia Getting Ready!”

The Canadian Forestry Journal will be sent to any address for one dollar a year, subscription including all other publications of the Canadian Forestry Association.

Address all Communications to

THE CANADIAN FORESTRY JOURNAL
206-207 BOOTH BUILDING, OTTAWA

Printed by the Rod and Gun Press, Woodstock, Ont.

Entered at the Post Office at Woodstock, Ont., as second-class matter.



On the Road to Emerald Lake, B.C.

Building a Canadian Aeroplane

By Alfred Rubbra, Jr.

How a Modern Flying Machine is Put Together at a Toronto Factory.

The manufacture of aeroplanes in Canada has created a great demand for the finest quality spruce, ash, birch, oak and white pine. The proper quality wood is very difficult to procure and there has never been a great reserve supply at an aeroplane factory.

The wood must be of a straight grain and pass the many inspections of the government and the manufacturer. The spruce used in the aeroplane industry in Canada comes from British Columbia. The Imperial Munitions Board have opened large mills in the various timber sections of the province. The output of these mills is many millions of feet of lumber a month. They supply the British and Allied Governments as well as the Canadian Government.

Great care is exercised to prevent poor quality wood from getting through. The first inspection takes place before the log enters the mill and the wood is again inspected before being shipped. On arriving at the aeroplane factory the lumber is inspected and cut into different sized lengths as required. It is then piled very carefully to prevent warping. A slight warping cannot be avoided so this is allowed for in the cutting of the lengths.

In order to dry the lumber to atmospheric conditions it is placed in a kiln, which is heated by steam. The air in the kiln is kept humid to boil out the sap and acids. This process is called case-hardening. This is done by allowing some of the steam to escape from valves in the radiators. If the air in the kiln was perfectly dry the wood would not dry to the condition required in aeroplane manufacture.

Ash, however, is an exception. It is not kiln dried. If it were the process would remove the properties required

Finding Wood Moisture

When the contents of a kiln are considered to be in the proper condition samples are taken by the inspector. These are weighed and put into a small furnace and dried absolutely. The inspector then weighs the wood again and is thus able to calculate the amount of moisture the wood in the kiln contains. If the result is satisfactory the contents of the kiln are taken to the mill. Many samples have to be examined to find out whether the wood is just from the river or has been piled for some time. In the mill it is cut into the required lengths for struts, beams for the wings, and the many other parts.

In the construction of aeroplane wings, spruce plays an important part. Great difficulty is experienced in getting the long beams necessary for the wings. The smaller pieces are not so difficult to obtain as the grain runs straight for short distances. One of the chief defects in the wood and the most treacherous because of the difficulty to detect it, is spiral grain, rammy grain and cross grain. The inspectors are, however, rapidly mastering it.

The ribs, which support the fabric, are in some machines made of spruce and are steamed and bent into the proper shape across a drum. In others they are supported by a webbing of white pine. The snow skids which are used in the winter in place of wheels are of ash. They are steamed and bent across a drum in the same manner as the ribs.

Making the Wings

When the frame of the wing is completed it is trued up and braced by means of steel piano wires of great tensile strength. The wing then has to have the fabric sewn on. The fabric is made in the form of a huge envelop. This must fit the frame perfectly. The fabric is of cotton or linen and is pulled on over the frame. A large number of women are employed in this department. They do the sewing.

After an inspection the wing goes to the paint shop. Here the fabric is given several coats of dope to preserve it and two coats of varnish. In the case of the flying boat the wings are painted naval grey instead of being varnished. The completed wing then goes to the stockroom.

One of the most important parts of the aeroplane is the propeller. In Canada the propeller is made of white oak. Birch is being used to some extent but has not yet been generally adopted. In England a great deal of walnut is used in making propellers.

The propellers differ in size according to the type of machine for which they are designed. The first step in the construction is to glue together the laminations which are pieces of wood an inch thick and slightly longer than the propeller in order to allow for shaping. When the laminations are properly glued they are put in a huge press which is then tightly screwed down. They remain until the glue is perfectly dry. They are then put on a lathe and roughly cut to shape. After this they are allowed to stand for six days in order that all strain due to cutting away portions and gluing, may be relieved. They are then placed upon an upright frame on which is a model propeller. The operator in charge of this machine runs his cutter over the model and the cutters on the machine follow his guidance. The process is repeated several times, each time cutting over the entire surface of the blade.

The propeller is sent to the benches where it is accurately clamped to

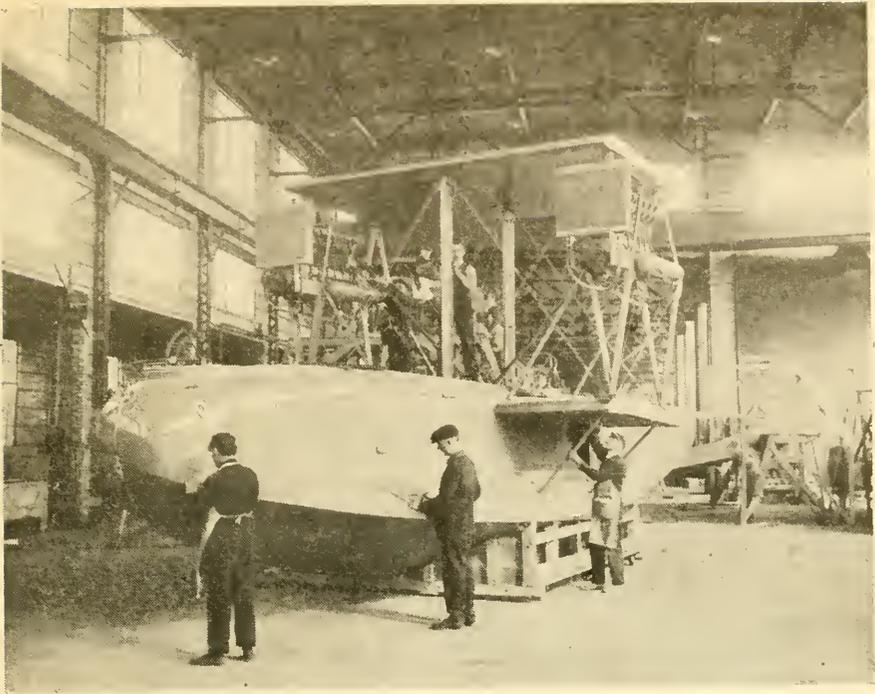
metal surface plates, similar to surface plates used in tool rooms, roughly balanced and after final sandpapering it is finally balanced. Expert workmen hand carve it to exact pitch. At the different points in its construction it undergoes very rigid inspections. At the final inspection it is tested for pitch, which is the angle of the flat side of the blade upon which the greatest strain is laid. The track is taken, that is to say the set of the blade from the centre of the hub to stations near the end of the blade. It must balance horizontally and vertically. The last step in the construction is the varnishing. After being varnished it undergoes the final inspection and balancing. A drop of varnish would throw it out of balance.

Once in a while a propeller gets as far as the final inspection only to be rejected for some flaw in the wood that cannot be detected from the exterior. The inspector pointed out one that to the inexperienced of the writer looked perfect. There was, however, a short dark streak in the wood which the inspector said was rot. This is one example of how minutely the parts of an aeroplane are inspected.

Care with the fusilage.

In the construction of the fusilage of an aeroplane, the longerons, or the beams which stretch from the head to the tail of the machine, are of white ash. It is impossible to get the wood in sufficient lengths with a straight grain to make the longerons out of one piece of wood. On this account they are spliced together. This is done by gluing the pieces together and bolting them, after which the joint is wrapped with cotton. These joints are so arranged that they come at the points in the fusilage where the least strain is brought to bear. The longerons are supported by several struts of white ash, although spruce is used wherever possible as it is much lighter. The fusilage is trued and braced by steel piano wires in the same manner as the wings. It is covered with fabric, doped and varnished.

In the construction of the flying



Working on an F-5 Flying Boat. Canadian Aeroplanes, Limited, Toronto.

boat which differs from the aeroplane the keel is of white ash. The ribs are secured to the keel as in a boat and the frame built up. The flooring and the frame is covered with three ply birch rotary cut.

Installing Engines.

The finished parts of the aeroplane and the flying boat are brought as required to the assembly room. Here the parts are assembled and the engines installed, before the machines are sent away from the factory. Each complete machine is carefully inspected and the engine started. Then if the aeroplane is in all respects satisfactory it is taken to pieces and packed very carefully. It is loaded on a flat car and is ready to be shipped.

Packing the finished machine plays a very important part in the aeroplane industry. The wings are crated separately and if there is any part of them that is likely to touch the crate precaution against damage is taken by padding the crate well. The wing is covered over before the lid

is placed on the crate. The body of the aeroplane is also packed in this way and the whole deposited on a flat car and carefully secured.

A great quantity of lumber is required in crating the machines and for this purpose a special grade of stock is purchased. Some idea of the size of the crates may be obtained from the fact that the wings of a flying boat are over one hundred feet from tip to tip. The body when crated occupies a whole railway car.

In the construction of aeroplanes little or no perfect wood is wasted. What cannot be utilized in the long beams, which are most difficult to obtain, can be made into smaller parts.

The Forestry Journal will be sent to any address in Canada for One Dollar a Year.

The Aeroplane in B. C. Forests

By J. H. Hamilton, Editor of "Industrial Progress," Vancouver.

The wonderful achievements of the aeroplane during the Great War foreshadow its use in many peaceful lines of industry and development.

One of the greatest assets of the Province of British Columbia is its enormous stand of merchantable timber which is valuable on the coastline in proximity to tidal water, owing partially to its ease of transportation and particularly to its density of growth. The greatest enemy to the forest is fire. Under unfavorable conditions, immense valuable tracts of timber may be destroyed within a few days from an outbreak of fire of small beginning. Frequently these conflagrations are initiated by the carelessness of campers and loggers. British Columbia is the greatest forest province of Canada. Her forests contain approximately half of the entire stand of the timber of the entire Dominion and twenty-four per cent. of the total stand of the Pacific Northwest.

The economic importance of the timber to British Columbia and to Canada as a whole may be realized when it is stated that the forest revenue of this Province is already larger than that of any other province of the Dominion; aggregating approximately \$2,500,000 annually from provincial crown timber lands alone.

The manufactured value of forest products of the province is from thirty-five to forty million dollars annually, and in 1917 the value exceeded the entire output of the mines of British Columbia.

It is therefore quite obvious that the most essential factor of the exploitation of our forest growth is protection from destruction by fire.

The British Columbia Government operating under the Forest Act, maintains a staff of forest guards, and patrol men which, immediately prior to the war, consisted of 395 men. War conditions and the financial situation have made it necessary

to institute severe retrenchment, and in 1915 the staff was reduced to 218 and further reduced in 1916 to 200.

The fire situation during 1917 and more particularly during the current year demonstrated conclusively the disastrous results that may be logically anticipated from the policy of letting the forest so largely take care of itself. Every citizen is directly interested in this important matter, as will readily be seen from a moment's consideration of the local economical importance of lumber. For this reason any factor which will tend to afford better fire protection than is at present feasible is of prime importance at the present time.

A realization of this point unduced the Department of Lands to make the experiment of patrolling the coast area by means of hydroplanes. An order was given to a local firm—Messers. Hoffar Brothers, Vancouver—for the construction of a flying boat or hydroplane which was completed and ready for delivery in August of this year. It was taken over by the Government on the first of September and made several successful trial flights over Burrard Inlet and Vancouver. On September 4th a trial flight under the pilotage of Lieut. Bishop, R. A. F., ended disastrously by the machine making a nose dive of twelve hundred feet, crashing on to the roof of a house in the West End of Vancouver and smashing the hydroplane to matchwood. The pilot miraculously escaped death or even severe injury, but the seaplane was irretrievably damaged.

Great regret is expressed at the untimely end of the first hydroplane constructed for this purpose, as its use would have been experimental and, if successful, would undoubtedly have led to a larger employment of this means of forest protection. It is stated, however, that the Government will immediately have con-

structed for them a new machine to replace the one destroyed, which will be ready for use at the beginning of the next forest fire season.

If the results attained are satisfactory, it is expected that the whole of the coastline will be regularly patrolled by this means, at a very considerable saving in men and with an increased efficiency. The great rapidity of motion of the hydroplane

combined with its wide range of cruising radius, would appear to make it the very finest means of fire patrol it is impossible to conceive. It is to be hoped, therefore, that the experiment will be made in due course and without a repetition of the unfortunate accident which put an untimely end to the experiment so far as the present season is concerned.

Women a Success in Planting Work

By G. P. Gordon, B. Sc. (Oxon.)

British Experiments Show Good Results in Care of Forest Nurseries and Even Felling.

During the year 1915, the Royal Scottish Arboricultural Society placed a number of women in forestry work on various estates throughout Scotland. These women were employed in estate nurseries and at certain branches at forestry work; in addition they took part in general estate work.

The women so placed were drafted from the working classes, and they had not undergone any course of training preparatory to their taking up employment in forestry. Many of them were unemployed women, who were idle because of slackness in certain industries, e.g., fishing, spinning mills, etc.

Experience of working squads of these women throughout Scotland has proved that this type of worker without training is not altogether suited for rural work on the land. Although in many cases good individuals and good squads were encountered, the average individual was too unsettled to obtain the maximum value from her work. It is thought that women of this class, for true economy, must be constantly in touch with their own homes, as they were found to be less adaptable than more intelligent and better educated women. Further, it was found that the supervision of this class of worker was somewhat costly, as initiative

so necessary in land work was almost entirely lacking.

Adapting Female Dress.

A problem which had a considerable influence on the efficiency of these workers was the question of dress. It was found that ordinary foot wear was quite unsuitable, and experiments were made with clogs, high boots, leggings, etc., and finally it was decided that stout boots and leggings were the most useful. The ordinary apparel of the women was found to be unsuited for wet weather, and experiments were made with waterproof skirts, which were not, however, found to be very successful. In nursery work skirts are always a drawback, as they damage young plants in the nursery lines, and also break down the edges of seed beds. In addition, in wet undergrowth they are a decided hindrance to freedom of action. For outdoor land work it is essential that women have the equivalent of a man's jacket, which can be donned during a shower and cast off in hot weather or for strenuous work.

A characteristic squad is seen in the illustration. It comprised some twenty women obtained through the Labour Exchanges in Glasgow, Edinburgh and Leith.

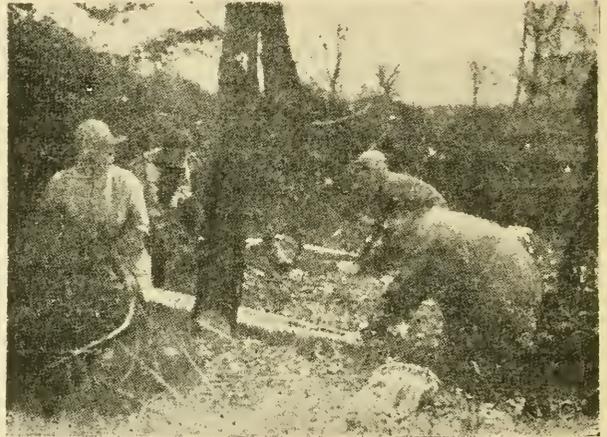
The question of housing this type



**English Women
Planting Trees.**

(See accompanying
article.)

**English Women
Felling Trees.**



of woman from her home was one which was attended with many and varied difficulties. In the first instance comparatively few of the women were able to do for them, selves properly. Further, although they had their food prepared for them they were not able to purchase food in a thrifty manner, and therefore had to suffer many discomforts. Probably as a result of this the women were difficult to control, and were somewhat unreliable as regards time-keeping.

Training Required.

A certain allowance must of course be made, due to the fact that the work and the conditions of labour

were entirely new to the women, most of whom were unacquainted with outdoor work and rural conditions generally.

The experience gained during the years 1915 and 1916 forced one to the conclusion that this class of untrained labour was not the most efficient for the purpose in view. An attempt was therefore made to partially train the women to at least a knowledge of outdoor conditions. In this connection the West of Scotland College of Agriculture organised at Kilmarnock in 1917 a scheme for this purpose. The women went into residence at the College farm for a few weeks, and were thereafter drafted to forestry work on different

estates throughout Scotland. There was no attempt made to train the women technically in forestry work, but they obtained an opportunity of experiencing land conditions. It was found that the type of women willing to undergo this period of probation was a more intelligent one than those formerly dealt with. In addition she was more adaptable, more reliable, and gave better satisfaction to her employer. These women were drafted to various kinds of forestry work, e.g., seed collection, forest nursery work, planting work, draining, bark peeling, timber felling, brushwood burning, and bracken cutting.

The important feature of this system was that it allowed of the selection of suitable women for the kind of work to be undertaken. The matron in charge at Kilmarnock was able to tell within a few weeks which women were suited physically, and temperamentally for land work. Reports from the estates on which these women were placed indicated that they were of the right type, and were giving complete satisfaction.

It soon became evident, however, that for their work to be economic, and to warrant their being paid a reasonable living wage, they must be trained to some extent. In arranging for the placing of the women, it was found to be unsatisfactory to have to state that, although they were of the right type, and were reliable, they had had no previous training. In a word, this simply meant that their employer had to train them. An attempt was made by the Ministry of Labour to establish small training centres in different estates, to which to send the women. This attempt, however, met with only partial success, as the underlying principle of training and education is a concentration of the agencies and resources available, and not a decentralisation of these facilities.

A School for Apprentices.

Accordingly, the West of Scotland College of Agriculture, in conjunction with the District Committee of the Middle Ward of Lanarkshire,

instituted this year a training scheme at Hairmyres, near Glasgow. The advantages to be derived from such a scheme are at once obvious. The training centre, Hairmyres, is situated about eight miles from the College in Glasgow, and is easily accessible from the city. It is thus possible to keep in close touch with the teaching staff of the College. Intending students are interviewed at the College, and are thereafter drafted to Hairmyres. The facilities on the estate of Hairmyres for training in forestry are probably quite unique. A large forest nursery of some ten acres is in full working order, and there is a staff of skilled workers in charge. The head forester has direct control of the women in training, and supplements their practical work with special lectures and demonstrations. In addition, there is a considerable area of newly planted ground—drained and planted by women labour—also young plantations and old standing timber. By means of these agencies it was found possible to give the women a fair idea of the more important branches of forestry. They gained experience in draining, planting and fencing; nursery work of all kinds was engaged in—e.g., lining out, sizing, seed sowing, etc. Special facilities were also made available for training the women made available for training the women in timber work. A plantation in the neighborhood was taken over and was felled, snedded, and cross-cut by the women. Fig. 2 shows that women are well able to undertake a large amount of the work connected with timber cutting.

Female "Fellers."

Although the period of instruction is too short almost to warrant the term training being used, reports from the employers of these women show that the scheme has been more than justified. Since the inception of the course in April, about 150 women have been passed through it and drafted on to forestry work elsewhere. Their work has included draining, planting, fencing, nursery

work of all kinds, felling timber, "snedding" and cross-cutting timber, measuring timber, and saw-mill work. Further, they have engaged in general estate work, bark-peeling, bracken cutting, clearing up and burning brushwood. During haytime and harvest they have been drafted to this work, which has the advantage of giving that variety which experience shows is so necessary in women's work on the land.

The sustained brisk demand for the services of these women is the best indication of their value. This demand has come from estates, trade nurseries, timber merchants, farmers, and contractors. These employers have shown that they regard as feasible this dilution of their labour, by their keen desire to make conditions as reasonable as possible for the women. They have gone to considerable expense and trouble to make the accommodation suitable and have even made alterations in the length of the working day. Experience has proved that it is more economic to work the women on a slightly shorter day than men, say start at 8 o'clock in the morning, and continue to about 5 o'clock in the evening, with an hour's break at mid-day. As regards working overtime, it is not considered

advisable to attempt this, as they require a fairly long evening to make necessary preparations for the next day.

The usual conditions of labour are free accommodation, with coal and light and, in some cases, potatoes, and a wage varying from 20s. per week to 25s. per week. In some cases, where the women are employed on piece work, they earn as much as 30s. and 35s. per week.

Improved Health.

The effect on the women of this kind of work, under the above conditions, has been noticed, and in no case has it been found to be detrimental. They have all been able for the work undertaken, and have quickly become fairly expert at it. Their health has, in all cases materially improved with the out-door occupation, and this has been so even in cases where they have been employed all winter.

In conclusion it might be allowed that in view of the foregoing, and having regard to the widest national interests, the training and organization of this woman power, which was formerly dissipated in unproductive labour, has been justified.

Merchantable Timber a Great Asset

Eric W. Hamber, Pres. B. C. Mills Timber and Trading Co., Vancouver.

There are few better assets for people to possess than good merchantable standing timber in this province. The supplies of the world are being depleted, and whilst there are large bodies of timber in Russia and other places, they can in no way be compared to the forests of British Columbia. Once cut, the forests of B.C. can never be replaced. There will be a new growth, but never the majestic growth that stands here to-day. It therefore behooves us to make the best of this natural resource fund nowhere else in the world except on the Pacific coast, to conserve it in every way possible, par-

ticularly against the ravages of fire and waste, in order that not only to those interested in the industry itself, but more so to the people of the province, should accrue benefits that at the present time they have but little conception of.

We must build our commercial structure on the solid rock foundations of our natural resources, or else we build them on foundations of shifting sand. Let me, therefore, urge that we all put our shoulder to the wheel and by co-operation of interest attain for this, the premier industry of this province, the maximum of result.

Do Forests Increase Rainfall?

By Dr. B. E. Fernow, Dean, Faculty of Forestry,
University of Toronto.

A Speculative Problem on Which Convincing Data is Yet to be Developed.

This question, often asked, includes two questions, namely, whether such increase is found over the forest itself, or whether the forest increases the rainfall over the adjoining field; the latter being, of course, the one practically most important. To ask the question is to throw doubt on what is axiomatic natural philosophy with every popular writer, but the candid professional student of the influence of forests on their surroundings will have to admit that we cannot yet demonstrate positively that, how, and to what degree the rainfall of a locality is influenced by forest cover. This ignorance is due partly to the complicated character of the problem, partly to the inefficiency of meteorological instruments for measuring rainfall, so that an exact proof cannot, as yet, be reached by measurement. Natural philosophy, however, leads us to assert that there is no condition on earth that does not have an influence on all other conditions more or less, and hence we can infer such an influence of forest on rainfall. Whether this influence in one or the other direction is of practical import is still another question.

A human rain maker.

Some years ago the Congress of the United States appropriated several thousand dollars for the writer—to his dismay—to be devoted to the production of rain by artificial means. This reference of the appropriation was made, because the writer had published a bulletin on the influences of forest cover on its surroundings, including rainfall. The experiments, however, were not to be made by forest planting and waiting a half century or so for an answer, but by bombarding the atmosphere, in the belief of the assertion that large bat-

ties were usually followed by rainfall—an assertion which was found then not supported by the existant evidence, although a book under the title, "War and the Weather," had brought together the statistics in this respect, leaving out, of course, the battles which were not followed by rain. In looking up the history of rainfall, it was amusing to find that in France suffering from floods the opposite effect, namely of driving away thunder clouds by bombarding the air, was expected to prevent these floods. The efficacy of prayer in breaking a drouth, and in some villages in the East Indies an official rainmaker is employed to perform the miracle. The Snake Dance of the Hopi Indians is such a prayer for rain.

The cause of rain.

At any rate, it became necessary for the writer to find out what was known as to the conditions under which and by what means Nature herself produces rain. It was found that even this fundamental knowledge was not very fully developed beyond the primary physical law that air at a given temperature and under a given barometric pressure could contain only a given amount of moisture and that by decrease of that temperature, as when a cold wind blew into a moisture-laden, warm current or by decrease of barometric pressure, as when such a current had to ascend a mountain, some of the moisture in the current would have to be precipitated as rain or snow. The same would take place if a warm, moisture-laden air current added its quota of humidity to bring to saturation a passing current.

In the first place, then, the sun, the oceans, the distribution of land and water areas, the air currents due

to the movement of the earth and due to differences of temperatures over large areas, are the causes of what we may call the *cosmic* climates; and by local modifications of these conditions the *local* climates are produced.

It stands to reason that our means are too puny to attempt an influence on the causes of the cosmic climate, and even the local climate can be influenced only in a limited way; especially if a practical issue or considerable degree of difference is considered.

Even if we have found, as we have, that temperature and humidity conditions in a dense and extensive forest are different from those of an open field, it remains still an open question of how and how far the forest condition influences the open field conditions and vice versa; and how large the area affected or to be affected must be to produce an influence of practical value.

Influence of large forests

We know without measuring that by interposing the shade of a single tree between us and the sun we have influenced the temperature of the air; by building a house around us we influence our local climate. A small plantation on the open prairie breaks the velocity and modifies the temperature of the air on the leeward side, but on the windward side such an influence would not be noticed.

We realize that a forest cover may produce certain air conditions, but their communication to surrounding country would depend on its location with reference to the prevailing winds: the forest located on the leeside will therefore have different influences than on the windward on the neighboring field according to their location. The whole exchange and mutual modification of conditions, and whether the one or other condition will prevail in a practicably sensible degree will depend on the size or area of the same. Not only the size of the area under forest, but the character of the forest, its density, its soil cover, its composition, elevation and exposure, its age and height will determine the degree of its influence. We can, therefore, not readily generalize from place to place.

All we can safely claim is that the forest condition, due to its lower temperature and greater relative humidity, is favorable to precipitation as against the open field with its higher temperature and drier air, which furnish less favorable conditions for precipitation. Extensive forest areas are as a rule favored by large rainfall, but is an open question whether the forest is the cause or the result.

We must doubt, however, whether the small woodlot is a rainmaker.

B. E. Fernow.

Wind Screen to Cost 20 Millions

Our government, says Pearson's Weekly of London, has a scheme in hand to create a wind screen of trees along the top of the cliffs of the exposed western coast, at a cost of twenty millions. This screen will not only supply much wanted wood, but will prevent the salt Atlantic gales sweeping over and souring the land behind it, so freeing millions of acres of land for wheat and other cereal cultivation.

QUEBEC'S FORESTS.

Quebec province possesses 130 million acres of merchantable forests of which about 48,000,000 acres are included in the fire-protected territories of the St. Maurice, Ottawa River, Laurentian and Southern St. Lawrence Associations. Another fifteen million acres of Quebec's forests are privately owned, about nine million acres being in the seignories.

The West Asks for Its Forests

Possession of the natural resources in the three prairie provinces remains for a while longer vested in the name of the Dominion Government. A meeting of the Provincial premiers at Ottawa in November brought this interesting question again into the realm of discussion, with the net result that the House of Commons will have to adjudicate the claims not only of the West but the counter claims of the East for Federal aid.

The Canadian Forestry Journal has frequently pointed out that entirely apart from the merits of their case, any expectation by the Western provinces of reaping an income from their forest possessions is a gross misapprehension of facts.

The Dominion Forestry Branch spends \$100,000 annually on forest protection in Manitoba. The total revenues do not exceed \$12,000.

On the Forests of Saskatchewan \$145,000 is spent by the Branch and \$9,000 is received.

On the forests of Alberta \$200,000 is spent and \$18,000 is received.

Even counting in the receipts of the Timber and Grazing Branch, the Dominion Government spends about \$200,000 a year on the prairie forests that is not covered by income.

The real and costly job.

Not all the premiers of East and West can alter the situation that actually exists. Some one will have to find \$200,000 and more every year to pay the cash deficit in the honest handling of the prairie province forests. The devastation of forest fires has been so tremendous that the business of any custodian, Dominion or Provincial, is to nurse back the timber growing lands into a self-supporting state.

If the West is willing to meet this outlay from provincial taxation, if it is willing to better the conservation methods at present in vogue, then who could quarrel with the transfer of the control from present hands?

These points were discussed by the conference at great length. It is understood that the Dominion Government interposed no objections to provincial management of lands, mines, etc. Protest came mainly from British Columbia, Ontario, Quebec, and the Maritime Provinces.

The Eastern and Pacific provinces did not object to the Prairie Governments getting their lands, but they claimed that, as it is a domain in which all the provinces have a common interest, they are entitled to extra subsidy in consideration of the transfer. Five millions is what was asked. Ontario and Quebec would get about \$2,800,000, and the lower provinces \$2,200,000.

The West at once entered a demurrer. It would not concede that the East had any proprietary interest in its domain upon which additional subsidy should be based. It did not object to extra subsidies for the Maritime Provinces, but held that Ontario and Quebec were wealthy states and could afford to let well enough alone. At this impasse the matter rests. The Federal Government may consider the whole problem during the next session of Parliament.

WHITE PINE SKY-ROCKETING

Readers of the Forestry Journal will be interested in a recent sale of white pine by Gustave Boswick, of Berthierville P.Q., at \$17 per thousand board feet, standing. Such a price for standing white pine timber has seldom been equalled. Nothing below 16 inches diameter was allowed to be cut on Mr. Boswick's property.

ERNEST POOLE MARRIED

At Cochrane, Ont., the marriage is announced of Miss May Gertrude Bryerton, daughter of Mrs. Theresa Bryerton to Ernest J. Poole, Fire Superintendent of the Ontario Forest Service.

British Aid for Research Enterprises

That Great Britain expects an increasing utilization of land for public purposes is indicated by the fact that one committee is working out ways and means of taking over land for community use. Another is at work creating a permanent national policy in regard to the employment of women. Incidentally, the plans for demobilization of the army are so minute and complex that there is a special committee at work planning to find positions for wounded and invalided officers in India, Burma, the Eastern Colonies and the Malay States. Great commercial development of India is hinted at in the plans of the industrial development commission. Subsidies to Indian industries when necessary, elaborate bureaus of technical information about new enterprises, and Government demonstration of the practicability of new industries are being considered.

Recognizing "the special need for new machinery and for additional State assistance in order to promote and organize scientific research with a view especially to its application to trade and industry," the Board of Education in 1915 proposed a scheme for the organization and development of scientific and industrial research. The machinery consisted at first of a Committee of the Privy Council with a smaller Advisory Council.

The work of the Committee increased so rapidly and plans for the future developed to such an extent that in December, 1916, the Government established a separate Department of Scientific and Industrial Research. At the same time the Government voted \$5,000,000 to meet the first five years expenditure. This Department, which in the view of the Balfour Committee will greatly strengthen British manufacturing industries, is promoting industrial research in four distinct ways. It is encouraging firms in the well established industries to undertake a co-operative study of the scientific problems affecting their processes and raw materials, and it is prepared to make substantial grants to Associations of firms established for the purpose with the approval of the department. It is undertaking at the public cost investigations which from their nature make them unsuitable for effective handling by any single industry, however powerful. It has taken over the property and financial control of the National Physical Laboratory and has assumed responsibility for the establishment of standards on a scientific basis. Finally, it is making energetic efforts to increase the numbers of trained research workers. The Department itself has established 21 Research Boards or Committees, the most important of them being the Fuel Research Board.

Central Institute for Research

At a meeting of the Reconstruction and Development Committee of the Dominion Cabinet, Dr. A. B. Macallum, administrative chairman of the Council for Scientific and Industrial Research, advanced the long-considered proposal of the Council for the establishment of a central institute for research.

The scheme, which is considered vital to a successful and permanent Canadian competition with the highly

organized industries of the United States, Great Britain, France, and other countries which have already the benefit of similar Government institutions, contemplates the immediate erection, at or near the capital, of a central laboratory building costing approximately \$500,000. The building, as planned, will provide room for expansion as the needs develop, but will at first have accommodation for some fifty laboratories,

covering all the essential industrial research subjects.

In a general way it is designed to fulfil for Canada the functions now performed for the United States by the Bureau of Standards at Washington and the Mellon Institute at Pittsburg. It will provide modern scientific equipment and methods for investigations of Canadian raw material, industrial processes, and manufactured products. It will serve as a national laboratory for standards of all sorts, for the testing of materials, for the discovery of methods of utilizing by-products of manufacture hitherto wasted, and generally for experimental work in the application of science to industry. The proposed national research laboratory will also be of incalculable value to the various trade guilds now being promoted by the Research Council in the leading Canadian industries. In fact, the national laboratory with its free ser-

vices and adequate equipment is almost a necessary first step to the formation of these trade guilds for mutual advancement.

In Great Britain the trade guilds under the direction of the British Research Council are now taking full advantage of the National Physical Laboratory near London and of similar institutions. In the United States similar advantage is taken of the facilities of the Bureau of Standards and of the Mellon Institute. It may be noted in this connection that the Governments of Great Britain and of the United States are annually spending millions for scientific research in industrial lines, to say nothing of many millions more spent by large private enterprises in connection with the laboratory work of large industrial establishments. In Canada the total annual amount thus expended is not more than \$200,000.

Labor and Capital Favor Research

The systematic starving of technical education and scientific research just because neither is what is called a "live political issue" apparently is coming to an end. At a meeting held in Ottawa, a committee consisting of Messrs. G. M. Murray, representing the Canadian Manufacturers' Association; W. MacLachlan, of the joint committee on technical organizations, and Tom Moore, president Trades and Labor Congress of Canada, presented to the cabinet a memorandum of joint recommendations drawn up at a meeting of the foregoing bodies. It embraces important suggestions of policy agreed upon by capital and labor as applicable to Canada's reconstruction period, and its adoption is strongly urged upon the government.

Among the important representations made by the joint committee is one relating to scientific and industrial research as follows:—

Having regard to the important

part which research must necessarily play in Canada's industrial reconstruction, the appropriation for that purpose should be increased to not less than one million dollars annually. The board handling that work should not be merely advisory as at present, but should be clothed with specific executive powers which powers should preferably be exercised by a board of managers, upon which labor, manufacturers and engineers would all have representation.

PROGRESS IN TECHNICAL SCHOOLS

In view of the exacting demands upon industrial skill and efficiency which will be made of every people in the competition for the trade of the world following the period of reconstruction, it is the intention in the next session of the House of Commons to bring in a bill to give force to a Federal policy for technical training of the rising generation. In

the various Provinces there have been more or less successful beginnings along this line, and in some cities like Toronto and Montreal some creditable institutions have been developed.

It is not intended in any way that the Dominion Government shall attempt to compete with or supplant these, or even supplement them, because the thorny question of Pro-

vincial rights always crops up whenever the Government devises a policy with regard to road construction, education or anything of the sort. In this case it is expected that the legislation will take the form of providing a sum of money to be divided among the Provinces on the basis of population and the progress already made in the direction of technical education.

Hydroaeroplane for Forest Protection

By Hy. Sorgius, Manager, St. Maurice Forest Protective Ass'n, Queb. c.

Although only conversant in a general way with reference to the possible application of the hydroaeroplane to forest protection, I am of the opinion that this machine will in the future be a valuable feature in forest protection work, both for the locating and reporting of forest fires. In other words we may call it "a moving observation tower."

The directors of the St. Maurice Forest Protective Association, at a meeting held on November 15, agreed to purchase a hydroaeroplane for the patrolling of our area beginning next spring. We have already corresponded with the Canadian manufacturers, asking them if they could build us a machine which would suit our purpose.

The advantages in the hydroaeroplane patrol, in my opinion, would principally be the locating and reporting of forest fires, and also in the rapid transportation of a small crew of men and equipment to the fire. The main feature in forest protection is prevention; secondly, to get at a fire when it is in its infancy, and we believe that, with the use of a hydroaeroplane, we will be able to detect and reach almost every forest fire before it has a chance to make any headway. In a country like ours there are large areas where, should a forest fire start it would take from a couple of days to a week to get the necessary help and equipment to the scene of the blaze. Dur-

ing all this time the flames are burning large areas of valuable timber, but with the use of the hydroaeroplane we shall be in a position to get men and equipment to the fire in a short time, thereby giving the men a good chance to extinguish same.

The State of Wisconsin had the hydroaeroplane patrol for one year and the Commission of Conservation is so greatly taken up with the efficiency of such a patrol that it is the intention to establish a permanent aeroplane patrol throughout Wisconsin, now that the war is over.

I may say that it is the opinion of our members that the hydroaeroplane is of great value for forest protection work and that it will be economical and satisfactory. Whether or not this will prove practical in our work, we are going right ahead with the establishment of the same for next spring.

The Laurentide Co. has, in its forest nurseries near Grandmere, Que., nearly 4,000,000 seedlings of different ages, to be used in planting operations between 1919 and 1921. These will be supplemented by purchases from other nurseries, until the capacity of the Grandmere nurseries can be increased to cover the entire planting programme of the company. The company's forester, Mr. Ellwood Wilson, reports that the cost of planting, usually with 3-year-old seedlings, is from \$9 to \$10 per acre.



Some Excellent Timber on the Limits of the Adams' River Timber Co., of British Columbia.

The History of Familiar Trees

By E. B. Luke, Montreal.

Where do trees and plants come from? What their history and habits of life? How are they produced, multiplied, and improved, for all fine fruits and flowers are artificial products, subdued, and ameliorated from the wild state by the hand of man?

You have doubtless heard of the giant Sequoia (the big tree of California), growing from 300 to 500 feet high and having diameters of from 20 to 60 feet, single trees of which are known to have lived for over 4000 years, with a possibility of nearly double that age. When one of these large trees in California fell not long ago, 4000 rings were counted. That tree was 40 centuries old. It was a strong, young tree when Abraham went into Egypt. It saw the destruction of Sodom and Gomorrah. It was nearly a thousand years old when David slew Goliath, and older when Christ was born, than the Christian religion is to-day, or the Junitor Oak in the forest of Fontainebleau

supposed to be 700 years old, or the olive trees in the Garden of Gethsemane at Jerusalem at least 2000 years old, and which, according to traditions, were in existence at the time of Christ. All these, though, were mere infants compared to the *Dragon trees* of the Canary Islands, one of which we are told was 42 feet in diameter when the Spaniards landed in 1402 and when destroyed by a storm in 1851 was supposed to be over 8000 years old.

By the Swimmin' Hole.

Then there is another class of trees historically important, a class closely interwoven with our boyhood life and as dear to our hearts as the old home-stead. I refer to the old Elm or perhaps it was a Hickory or Willow that marked and spread its protecting branches over the favorite swimming hole of the gang. What stories of boyish pranks and good times it could tell? Or the big

Maple growing near the little district school into whose bark was cut the initials of all the boy celebrities of yours and previous generations.

Time doesn't permit any extended reference to the luscious Bartlett Pears, Black Heart Cherries, Damson, Lombard, and Gage Plums, or the juicy pippins or huge pumpkin sweet apples that used to grow on the old homestead, and that somehow, notwithstanding that they tell us fruits are constantly improving, we have never been able to taste the equal of since.

Unfortunately, it is only within the last seventy-five or one hundred years, that any serious attempts have been made to trace back the manifold forms of tree and plant life to their obscure beginnings.

Interesting as this subject is, I have only space to give you very briefly a few of the imperfect results thus far obtained in tracing back the thousands and thousands of species, (about 200,000, to be more exact), in the vegetable, plant, and tree kingdom, but let me emphasize that man has not discovered and cultivated in the last two thousand years a single species that can rival maize, rice, cereals, the potato, the date, the banana, and which date back three, four, five, and in some cases, six thousand years.

Where the Fruit Trees Originated.

Briefly the origin of the apple as far as it has been able to trace it back, is eastern Europe and Asia; the Peach, China; the Pear, Temperate Europe and Asia; the Apricot, China; the Quince, Persia; the Turnip, Western Siberia and Europe; the Watermelon, Africa; the Banana, South Asia; the Onion, Persia, Afghanistan and Palestine; the Cucumber, India; Barley, Western Temperate Asia; Rice, India and Southern China; Wheat, the regions of the Euphrates; Potato, native of Peru, Chili, Mexico; Grapes, Western Siberia and Europe; Tea plant, native of China; These are all known to have been in cultivation upwards of four thousand years.

The following very incomplete list is known to have been in cultivation

for more than two thousand years:— Radish, Temperate Asia; Carrot, Europe and Temperate Asia; Celery and Lettuce, Central and Southern Europe Northern Africa, Western Asia. Asparagus, Western Asia; the Cherry and Plum, Persia and vicinity; Oats and Rye, Eastern Temperature, Europe (says nothing about Scotch.)

Among those that have been under cultivation for less than two thousand years, can be mentioned the Orange, a native of India and China. Parsnip, central and southern Europe; Spinach, Persia; Raspberry, Temperate Europe and Asia; Strawberry, Western Asia and eastern North America.

Tobacco is a native of Central America. From the first it was detested by all Governments, Kings and Emperors prohibited its use. Cromwell sent his troops to ride down the growing crops. Chas. the Second imposed a penalty of 1600 pounds per acre and now comes along our own Government with its new taxes on our old friend and companion, yet I feel sure the herb of amiability will still flourish even as it has done since ancient times.

The Origin of the Rose.

The origin of the rose is lost in antiquity. It is certain that they abounded in Palestine and that the Jews possessed great knowledge of their culture and held them in high esteem. The Egyptians grew Roses on the bank of the Nile and as early as the days of Homer, the Greeks had them in abundance. The Romans delighted in the luxury of roses and used them in incredible quantities. Nero spent 30,000 pounds for a single rose bouquet. Then the rose found its way into Persia where love and honor awaited it.

I do not imagine our Creator ever intended to endow the earth with perfect fruits, flowers or plants in the beginning, but rather to place with us an average lot of material to work on and to leave to the ingenuity of mankind the working out of his destiny in this as in all other respects, and man being superior to the beast

of the fields and forest, set about improving his condition.

He found that in the wild state every genus of tree consists of one or more species or strongly marked individual sorts. For instance, the wild cherry, the sour cherry, the mazzard cherry, etc. These species in their natural state exactly reproduce themselves. That is, they come true from seed. This they have done for untold generations and will continue to do as long as they exist *under natural conditions only*.

Cultivating New Species.

On the other hand, suppose we gather the seed of one of these species and plant it in our gardens. We shall find that the leaves and habit of growth of many of the seedlings it produces do not entirely resemble the original species, while of course having some of its characteristics, and when they come into bearing there will also be a great diversity in the size, color, and flavor of the fruit. Each one that differs

from the original type constitutes a new variety. Once in possession of a new variety—an artificial product—especially if it has marked differences or shows improvement over the original, we have in our hands the best material for the improving process.

Why do not varieties produce the same from seed? Why if we plant the stone of a Lombard Plum will it not always produce a Lombard Plum, or if we plant the seed of the Fameuse apple will we not always get a Fameuse? It will be remembered that our garden varieties of fruits are not natural forms, they are the artificial products of our culture. They have two strong tendencies: one to improve, the other to return to the wild state. Between these two tendencies it will be generally seen how unlikely it is for the progeny of varieties to reappear in the same forms. In fact, if culture were abandoned for a few years, cultivated varieties would disappear and return to their original forms.

Canada's Tree Farm of 250 Million Acres

(From Dominion's Royal Commission Report.)

The forest resources of Canada undoubtedly form one of the most valuable assets of the Empire. The extent of the timber lands of the Dominion is so vast and so varied in character that no adequate survey of their area and commercial value has yet been undertaken. Estimates of the Forestry Branch of the Department of the Interior place the extent of land covered by timber in the Dominion at between five hundred million and six hundred million acres, or about a quarter of the land area of Canada. A large proportion of this, however, does not yield commercial timber. Estimates of the amount of merchantable timber vary greatly. The Minister of the Department of the Interior has given us a figure of 250,000,000 acres as the estimated area covered with trees which could be used for sawing into

timber. In addition, there is land covered with timber which is valuable as pulpwood, and for other purposes.

The main distribution of the commercial timber throughout the Dominion has been estimated by the Forestry Branch of the Department of the Interior to be as follows:—

	Acres
British Columbia.....	50,000,000
Alberta, Saskatchewan, Manitoba.....	11,000,000
Ontario.....	70,000,000
Quebec.....	100,000,000
New Brunswick.....	9,000,000
Nova Scotia.....	5,000,000

In the north of Alberta there are very large areas covered with wood which is of no commercial value, except for local purposes such as firewood and fencing. The North-West Territories and the Yukon

contain wood which can be used locally, but the forest areas there are regarded as having no commercial value. Enormous tracts have been

burnt repeatedly by forest fires, and a considerable proportion of the most northerly part of the country consists of tundra.

France's Profit from Forestry

In France, in the last 60 years, 2,300,000 acres of absolute waste land of various descriptions were reclaimed by forest planting at a total cost of \$15,000,000. These areas are now estimated to be worth \$135,000,000 and furnish annual crops valued at \$10,000,000. or in other words, yield 67% on the initial outlay. These examples of the profitableness of practical or, if you will, scientific forestry can be multiplied indefinitely wherever it has been carried on long enough.

What does this scientific treatment that leads to such results consist in? First of all, in a difference of attitude, namely, in considering timber as a crop capable of reproduction, and not looking on the forest as a mine which is bound to be exhausted. Instead of allowing a lumberman to cut down and carry off all that is good and marketable, and leave the poorer materials and the slash to

burn, or permitting a reproduction of the good, bad and indifferent species which nature unaided might chance to establish, the forester first of all ascertains in detail the character and composition of the forest property. He then makes a plan—a working plan—in which it is determined how much of a felling budget may be taken properly and yet assure continuous crops. He then proceeds to cut with a view to securing the new crop, first improving the composition by removing or killing the weed trees to give better chance for the valuable species, and then cutting the old crop gradually, as the young crop needs more light. Or else, he may clear the entire stand and replant the area, a method under which 65% of the Prussian forests is managed. There are a number of other methods, each adapted to given conditions.

B. E. F.

Spinning Out the Tree Supply

R. O. Sweezey in "Financial Times."

The Province of Quebec possesses three hundred million cords of spruce and balsam pulpwood in her standing forests, Ontario's forests are roughly estimated to contain two hundred million cords—facts that should impress the economist and to many no doubt it suggests the idea that our forests are inexhaustible.

That the larger province of Ontario should possess so much less than Quebec, naturally prompts enquiry and the reason is found to be FIRE, FAULTY LUMBERING METHODS and WANTON DESTRUCTION of the forest at a time when it had no particular value; Quebec suffering less because railroads did not

reach into her hinterland to the same extent as in Ontario. But since spruce, about 25 years ago, became the all-important wood in the production of fibre for the manufacturers of newsprint paper, the forests of Quebec and Ontario have acquired a monetary value that is simply incalculable, especially considering the wonderful distribution of water powers around which the growing pulp and paper industry leads all others in creating and developing new urban communities.

Viewing the rapidity with which this industry has grown in Quebec and Ontario and considering the vastness of the forests, still virgin and into

which yet greater expansion of the industry may be looked for, the thinking economist must surely ask how long the forests will resist the onslaught. And he may perhaps logically base an answer upon such a statement as contained at the beginning of this article: namely, that in Ontario and Quebec there are 500 million cords of standing pulpwood—an estimate that the writer has made

after covering most of the forest areas of the two provinces.

On such a basis these forests could be regarded as providing a perpetual supply of pulpwood at a rate sufficient to operate all existing paper mills in Canada and the United States. Even at that the annual increment would be less than one per cent—a growth much below what is possible by scientific forestry.

Forestry and Imperial Safety

By M. C. Duceyane, F. S. I., London.

I have emphasized the connection between timber supplies and the safety of the Realm. I would remind you that with the comparatively small trade in the time of our ancestors, there was then a good reserve of timber in Great Britain. Nevertheless *they* fully appreciated the importance of ensuring Oak reserves for the British Navy and the safety of the Realm. With our enormously increased national turnover, is not the importance of creating reserves here now extended to *all* the varieties of timber so important to our collieries and other national industries? The safety of the Realm surely demands that forestry should be encouraged by every section of the community.

Let me remind you of the scheme for national afforestation outlined in the Forestry Report. The benefits to be derived from a comprehensive scheme are too many to enumerate and their value is beyond estimation. What assessment could we place upon the safety of the Realm; the revival of rural life; robust country industries; Imperial development? These things cannot be computed in money.

And what of the cost of a scheme? Let me give you a single fact. The outbreak of war found us deficient in reserves of timber. We had to buy supplies from abroad, pay whatever price was asked for them, and were very fortunate to get them at all. During only the first two years of

the war the enhanced cost of imported timber—over the pre-war price—was 37 millions pounds sterling. The figure represented by the increased cost of imported timber during this war will probably exceed the total cost of any scheme of afforestation.

We hear of enormous sums freely advocated for the nationalization of public houses and other purposes. Many of these problems can be solved by measures of reform on broad lines or by reasonable restrictions imposed in the national interest. I hope that the limited funds available after the war will be utilized mainly for financing remunerative schemes relating to the development of our own country and the Empire.

PUBLIC FORESTS IN CANADA

"The Globe," Toronto

"A forest is not a thing that the average Canadian capitalist cares to tackle on any other basis than a complete sweep of the standing timber. To provide the sort of forest that will yield an annual crop in perpetuity plans must be laid for periods far longer than the life of a single generation. That is why if we are to have forests in Canada of the sort that are to be found all over Europe they must be civic, provincial and national—controlled for the public benefit by public authorities."

Air Fighters for Timber Guarding

On the subject of aerial forest patrol the Montreal Star thus quotes Mr. George R. Sighthall, honorary secretary of the Canadian Division of the Aerial League of the British Empire:

Among the best services these aviators will be able to render to their country will be forest ranging. The Dominion has such vast territories of timbered lands that it is impossible at present properly to patrol even the fringes of them; and the fire losses of Canada run into millions upon millions of dollars. The forest rangers now go on horse-back or by canoe, taking days and weeks to travel from one point to another from which they can take a survey of the surrounding country, and then, owing to the illimitable territory, are only able to guess at the exact place where the fires are raging. Then it takes them days to get back and set in motion the fire fighting forces of the countryside.

By the establishment of an aerial forest ranging service, aviators could cover hundreds of miles in a day, and with the knowledge of map reading and other sciences they are now learning overseas, would be able at once to locate the position of a fire and fly to the nearest habitation to send out the alarm, and save thou-

sands of acres of timbered lands from destruction. Mr. Lighthall expressed the belief that by the establishment of such a service the fire losses of Canada would be better than cut in half, and the appalling destruction of the country's timber resources limited. The amount of property that would be saved in one year by such a force would pay for the cost of such service many times over.

Senator George E. Foster, chairman of the Aerial Transit Committee of the Aerial League also believes in the practicability of such service. He says:

"Those of us who realize the immense value of the timbered area of Canada must appreciate the fact that the great destruction from fire of our forest reserves must cease if we are to provide pulp and paper for the world, as some of us dream. I am one of those who hope that the Government will see its way to assist in this development. I am satisfied that if we do not do so we will be blamed by that splendid band of Canadian heroes who will come back from France and Italy and other fronts, imbued with dreams of national development, and who will blame us if we fail to take the preliminary steps necessary in order to gratify their ambitions."

To Victory Loan Subscribers

A letter to the Canadian Forestry Journal, by Talbot Lee, Toronto.

You are now in partnership with the Dominion Government.

As a Canadian citizen you have always been interested in the conservation of Canada's national assets. Now more than ever it is your concern to see that these assets, one which your loan security is based, are not in any way depreciated.

The forests of Canada, occupying in the main, areas unfit for agricultural development, form one of the most important components of our

national wealth, the exported products of which equal those of all other manufactured goods put together.

Negligence in the past, has consigned to the flames two-thirds of Canada's original timber wealth.

The most potent factor in preventing a continuance of this disastrous state of affairs is to be found in the activities of the Canadian Forestry Association.

Their power to extend these activ-



How the tree enters into the aeroplane. Making small sections of a biplane at the Canadian Aeroplanes, Ltd., Toronto.
(See special article in this issue).



The picturesque "pointers," of the Canadian riverdriver



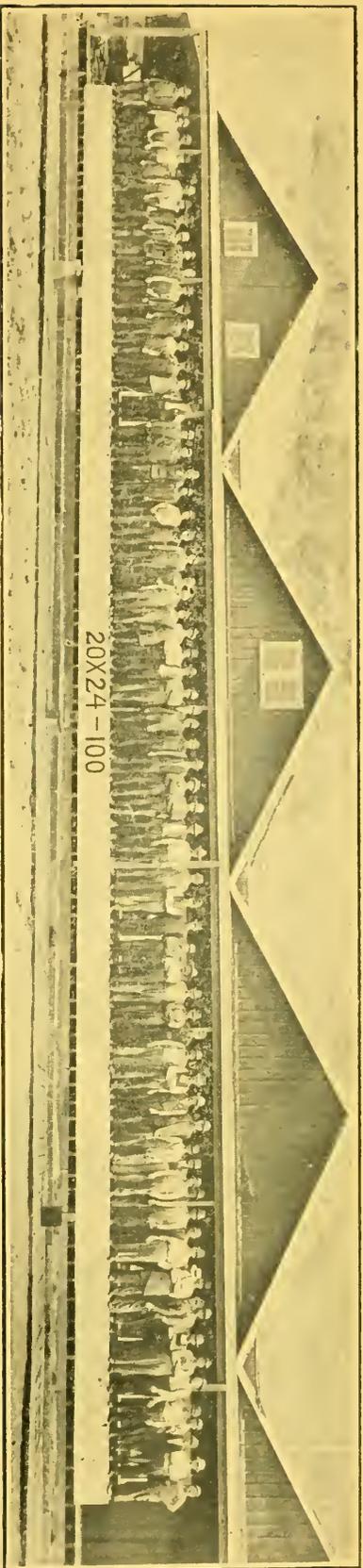
Valley of the Athabasca, Mt. Hardisty in centre, Jasper Park.



What trees do for a city. On the famous Driveway at Ottawa



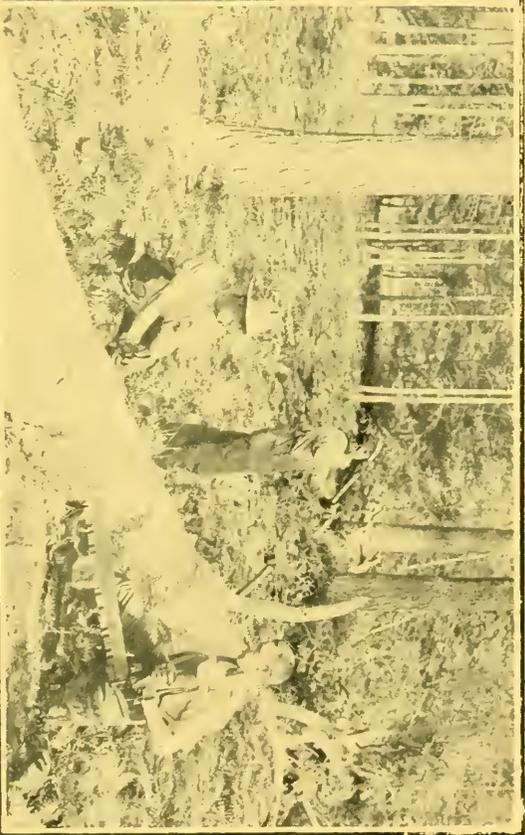
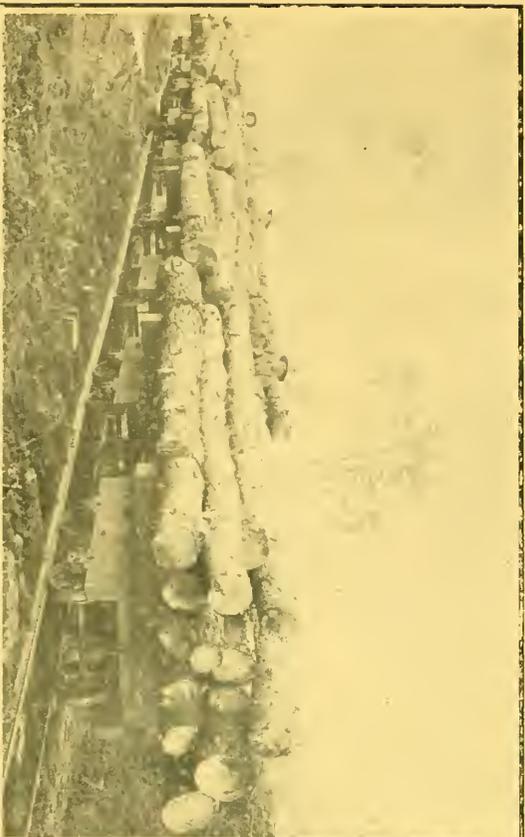
The Rideau River at Ottawa. One of many lovely vistas within the city limits.



20X24-100

How is this for a single piece of timber from the Pacific Coast, 100 feet long!

Courtesy "The Timberman,"



Canadian Forestry Battalion men at work in France, and some of the splendid logs produced under modern French forestry systems

ities is conditioned by the amount of support they receive from the general public.

All those possessing any degree of public spirit are interested in maintaining unimpaired the sources of national prosperity and you have

now an increased solicitude towards furthering that end.

If you are already a member of the Canadian Forestry Associat on it is your duty and in your own interest to secure other members.

If not already a member you should surely join without delay.

A Forestry Mosaic of British Columbia

The exhaustive investigation of the forest resources of British Columbia by the Commission of Conservation, extending over a period of three years, discloses the fact that of the total land area of the province, 355,855 sq. miles, approximately 200,000 sq. m. is incapable of producing forests of commercial value. About 145,000 sq. m. lie above the merchantable timber-line, and on 55,000 sq. m. though below timber-line, the soil is either too rocky or wet, or the forests have been completely destroyed by fire that there is no hope for the natural re-establishment of forest conditions for centuries to come.

A great forest area.

Of the remaining 155,855 sq. m. which is capable of producing forests only about 28,000 sq. m.—less than one-fifth—carries sufficient timber to be classified as statutory timberland. (The Land Act defines "timberland" as that, which when situated west of the Coast mountains, carries at least 8,000 b.f. per acre; when east of the Coast mountains, 5,000 b.f. per acre.) In the interior of the province there are areas of forest land, aggregating 23,800 sq. m. which, though not reaching this standard, carry between 1,000 b.f. and 5,000 b.f., part of which may be utilized. Only very meagre data have been obtained, as yet, as to the area of land which can be used for agricultural purposes. It appears from our forest land classification that somewhat over 5,000 sq. m. is grass land or very open forest, some of which is suitable for cultivation, but the greater proportion is of value only for grazing.

In addition, there is, perhaps, from 12,000 to 15,000 sq. m. cleared or under forest which is, or may be more valuable for agriculture than for forest production. Deducting this potential agricultural land, say 20,000 sq. m. from the land capable of producing commercial timber, there is 135,855 sq. m. of absolute forest land which should be devoted permanently to forest production.

The Record of Fire.

The timber on about 100,000 sq. m., or two-thirds of the land once forested, has been totally destroyed by fire, and on over half of the remaining 55,855 sq. m. has been seriously damaged. Using the timber still standing as a basis, it is estimated that the province has lost, through forest fires, at least 665 billion feet board measure. When one considers that the total stand of saw material in the whole Dominion probably does not greatly exceed this amount now, the seriousness of this loss, which can be attributed very largely to public carelessness, becomes apparent.

The total stand of saw timber and pulpwood material, in British Columbia, as ascertained by the survey of the Commission of Conservation, is 366 billion board feet.

Of the species which are used in the manufacture of pulp and paper (hemlock, balsam, spruce and cottonwood), there is 170 billion feet, equivalent to 243 million cords of pulpwood, which may be increased to 250 million cords by utilizing smaller-sized timber. In view of the fact that the limited supply of pulpwood

is becoming a very serious matter in eastern North America, it is of interest to know that so considerable a supply may be obtained in British Columbia.

The estimate of the forest resources of the province submitted in the report of the Commission of Conservation is based on a much higher percentage of detailed timber cruises

than any forest report of a similar nature heretofore issued. It is believed, therefore, that the information will be valuable, not only to the governments, which control the forest policy in the province, but also to timber owners and financial interests, on whom the development of industry so largely depends.

The Fire Fiend's Work on Pacific Coast

Statistics compiled by the British Columbia Forest Branch of the Department of Lands and authorized for publication recently, go to show that the 1918 Forest Fire season was noteworthy in the latter part of June and the first week in July for the greater fire risk since 1910. What looked as if it would be a season of moderate risk was broken by three weeks of extremely hot and dry weather, and the major portion of the total damage resulting from forest fires occurred during this danger period. The number of fires which were fought by the Department at an expense number approximately 200 for the Province, the total number of fires being 900.

Co-operation of Public.

Efficacy of the light car patrol service, inaugurated by the Department last year and expended this season, is emphasized by the number of "no-cost" as against "cost" fires. Added to this, the report acknowledged liberal co-operation on the part of the general public on a far greater scale than hitherto. Promptitude in reporting incipient bush fires resulted in the saving of a considerable expense to the Department.

Total Losses.

Total fire loss to the Forest Branch is given as \$34,726; total area burned over, 70,559 acres; total damage done (timber, stock range, logs, equipment, buildings, etc.), \$143,153.

Merchantable timber: area acres

killed, 4,175; thousand board feet killed, 16,752; thousand board feet salvable, 9,100½; net stumpage loss, \$10,060.

Other forms of property: forest products cut, \$43,080; buildings, \$4,950; logging and railway equipment, \$75,000; miscellaneous, \$300.

Preparing for Next Year.

Considerable expenditure was made during the fall on slash burning, notably in the Vancouver, Vernon and Cranbrook Fire Districts. Several thousand acres were burned over, which will materially lessen the fire hazard for 1919. During the year 140 miles of fire line were constructed; two new telephone lines installed for forest protection purposes and several new trails were cut with the same object, all of which are intended to increase the efficiency in handling forest fires.

Forest rangers and patrolmen this season numbered 160, as against 183 for 1917. This smaller force had, however, an increased number of light cars allotted, and the general result was a greater mileage covered in less time; the vital factor in dealing with forest fires.

The Forestry Journal will be sent to any address in Canada for One Dollar a Year.

The Basis of Canada's Supremacy

"Canada's supremacy as a paper-producing country rests upon the possession of large areas of pulpwood forests estimated, according to Government statistics to cover about 350,000 square miles of territory, together with abundant water-powers. While this supply of wood is by no means inexhaustible—some authorities, in fact, predicting its complete exhaustion within a comparatively

few years at the present rate of consumption—it is sufficient to insure the reasonable prosperity of the industry for some time to come, and, with due regard to scientific cutting and reforestation for future needs, which is just now beginning to receive attention, it can be made practically self-perpetuating.—*F. J. Campbell, President, Canadian Pulp and Paper Association.*

Where the Forest Dollar Goes

*By the Secretary of the Canadian Forestry Association,
in Quebec Telegraph.*

"Last year, Ontario completely over-turned its old forest protection system, and now employs over 1000 rangers and has spent \$500,000 on timber guarding since March last. New Brunswick last year built up an entirely new forest service at a cost of \$100,000 a year. Nova Scotia is now considering the appointment of a Provincial Forester to combat timber destruction. In all parts of Canada, the public is rapidly realizing that "timber-guarding" is just another name for steady employment, thriving towns, busy railways, a buoyant Provincial treasury, an eager home market and an expanding export trade.

Of every dollar that comes out of a log, four parts go for wages and supplies and the other part pays taxes and interest on the investment. The man who carelessly burns down \$1,000 worth of timber is robbing his community of \$800 worth of wages and merchandise purchases. Guarding the nation's timber from needless destruction is, therefore, simply a matter of guarding the bird that lays the golden eggs.

"If Quebec insists upon retaining and developing its great spruce forests during the next 25 years, it will hold the trump card in bidding for new industries. New wood using factories must locate near the

source of supplies. They cannot do otherwise and survive competition. The horoscope of Quebec province, therefore, shows up the standing forests as the great magnets to new population and new wealth.

Some other provinces may boast gold, silver and copper mines of spectacular richness, but they endure only a brief time and once used up can never be replenished. A few forests of Quebec spruce are to be valued vastly more than silver fields, inasmuch as forests produce immediate wealth and can be so handled as to yield repeated harvests of precious timber for all time to come.

"We often encounter the notion that the limit holder and the farmer are necessarily antagonistic in aim. This is foolishly untrue. The lumber or pulp mill use a tree crop gathered from land mostly unfit for farming. Nobody wants timber retained on good agricultural soils. All that any reasonable Canadian suggests, is that every acre should produce some form of wealth. Those acres of no value for agriculture are usually of supreme value for growing timber. Has any farmer a real quarrel with the idea of retaining timber crops where plow crops cannot prosper? That is "forest conservation" in a nutshell."

Look to the Raw Materials!

By the Editor of the Montreal Financial Times.

Practically half the Canadian pulp mills are situated in the province of Quebec. Geographically, the Province of Quebec is ideally situated in this respect. Quebec is much nearer the ultimate market for most pulpwood products than any other district containing an equal supply of the raw material. The rivers in Quebec, with possibly but one or two minor exceptions, flow to the south ward, and here again is Quebec's position unique, for it places her mills in direct connection with the heart of the timber lands. It has been stated that in no matter what part of the province timber is cut, it can be floated to market with ease.

The war has done much to broaden the scope and value of this—Canada's premier industry—and to make her manufactured article known and favourably thought of the world over. It has been the means of bringing the Canadian product into direct competition with the product of the Scandinavian mills—and it has stood the test. The day is not far distant when the paper which is manufactured in Eastern Canada will create a new standard of quality for the world.

But the industry must not be abused, particularly in sections of the country where it is now most strongly entrenched.

The supply of wood can be made practically everlasting if each section of land is properly cleared and precautions taken to ensure another crop in a given time. These precautions have been the matter of much discussion and extensive study on the part of foresters and various means to bring about this end have been and are being tried out.

In such times as the present when paper mills are operating at a high rate of capacity some such measures must needs be taken. When it is mentioned that within the past six or seven years the consumption of pulpwood in the St. Maurice Valley

alone has increased nearly 250 p.c. this point can readily be appreciated.

Much Constructive work

Protective measures are necessary against man's most dreaded enemy—fire. In the St. Maurice Valley, with a watershed of 16,000 square miles, some 35 p.c. has been burned over, while about the same percentage has been lumbered, so that the balance of virgin forest is not large in proportion. Methods for saving the natural forest resources of the province, are, of course, continually being improved and this is a most satisfactory point to note from a national viewpoint.

The importance of this work cannot be under-estimated and should receive every possible encouragement. It will ultimately make the Province of Quebec the greatest pulp and paper producing area of its size in the world, bringing into the country untold millions of dollars each year and assuring Quebec its "place in the Sun."

ONTARIO'S FOREST REVENUE

The important part the Crown timber lands of Ontario play in defraying the costs of civil government is indicated by the fact that during the last provincial year forest revenue was collected aggregating \$1,695,703, a gain of \$360,382 over the previous year, and including \$115,327 collected from limit-holders as fire-ranging dues. Nearly one hundred million feet less pine lumber was cut than during the precedent year, labor shortage operating largely toward this diminishment, although the progressive depletion of the white pine forests is clearly recognized. The total pulpwood "cut" for the province was 445,978 cords, of which approximately equal amounts were cut from settlers' lots and Crown timber areas. It is regarded as beyond question that the pulp and paper interest will continue to expand and this development will materially aid in the redemption of Canada's war debt.



Leanchio I Mountains, near Glacier.



Natural Highway, Rocky Mountains Park.

New Brunswick to the Fore! And Why?

By G. H. Prince, Provincial Forester.

Go-ahead Policy of Practical Forest Management—Political Control of Rangers Outlawed.

The present marked development in forest administration in New Brunswick, may be traced largely to a Forestry Convention held in Fredericton just eleven years ago. At that important gathering of practical and scientific men, the many problems of Proper Utilization, fire protection and forest conservation were fully discussed and many far-reaching resolutions were presented to the Government. The most important and immediate result of the convention was the establishment of a four years' course in Forestry in the University of New Brunswick in the following year.

In all, twenty-four foresters have since graduated from this university a small number, but well worth the effort when you consider the great part they have taken and are taking in the development of forest conservation in Canada.

Before attempting to state further what the Government has done, let us consider the progress of forestry with owners of granted forest land. One company owning over one and one-half million acres of forest land in New Brunswick early started the surveying and cruising of their limits. This forest survey, a task that took over five years, furnished the company with accurate timber maps, timber estimates, reports on the conditions and growth of the timber, etc. This information has had much to do with shaping this company's policy in regard to the disposal of its timber towards an increased income and a perpetual supply. Quite extensive surveys have also been made by two other large owners of private lands.

Learning true Conditions

The Government of New Brunswick, no doubt realizing, as the

private companies have done, that the best results in the management of its greatest resource, the forest, could not be obtained without a full knowledge of that asset, passed the Act which provided for the Forest Survey and classification of the seven and one-half million acres of Crown Lands. This survey, commenced in 1916, has been continued as rapidly as possible, consistent with war conditions, and already nearly one-quarter of the total area has been surveyed and mapped, at a cost of approximately four and one-half cents per acre.

The objects of the survey as defined by the Act, are, briefly: First—To report with as much detail as possible upon the character and quantity of the lumber, estimating the quantity of timber and the reproductive capacity of the forest.

Second—to estimate as accurately as possible the annual growth of timber upon each area or tract.

Third—To report upon the accessibility of the timber on each section estimating cost of logging on the different areas and cost of driving.

Fourth—To report the location of lands deemed suitable for agriculture, distinguishing them from other lands that might be regarded as suitable for the growth of timber only.

In order to obtain the above information the most modern and scientific methods of timber estimating and mapping have been employed, and this survey is said to be the most extensive of any survey of its kind in regards to area in North America.

What the Survey Does

Of what use is the Forest Survey to New Brunswick. Briefly:

- (1) It will give definite informa-

tion of the quantity, quality and value of the timber on any area, from which the stumpage value may be determined. It will show the quantity and quality of species now of little commercial importance because of lack of market demand, and possibly it may show that these species can be marketed profitably, or where quantity justifies it, to induce industries utilizing these inferior species to operate within the province, thus profitably utilizing material which is at present going to waste.

(2) The estimate of the annual growth will determine whether or not the annual cut can be increased, or whether to perpetuate the industry restrictions should be placed on certain species to regulate the cut.

(3) The information on soils will permit of directing agricultural settlement to districts offering the greatest prospect of success, thus protecting both the future settler and the licensee.

Value in Fire Prevention.

(4) In what way will this Forest Survey benefit Forest Fire Protection in New Brunswick?

First of all we have an excellent base plan from which to build our Forest Protection plan. Our map will show all passable portages, all old portages, and trails, all roads passable for wagons, and all roads passable for automobiles: it will show all telephone lines, all canoeable streams, all camps, the location of all green timber, burned areas, bad slashes, and dangerous points, possible lookout stations, area visible from them, possible observation points and areas visible from them.

From the network of portages and canoeable streams we can plan an efficient system of control; we can see clearly where the tool caches are most needed, where look-outs will be most beneficial. When fires do occur it will show the Forest Ranger where the heavier timber is, and whether the fire is being blown towards timber, a swamp, a heavy slash, and many of the things he needs to know at once. The plans will also show the areas of most danger, where the most of the

recent burns have occurred, etc. Our Chiefs of Party are instructed to collect all local knowledge available regarding all matters of fire protection and to prepare a plan of patrol whether by auto, saddle horse, canoe or by foot as the case may be, showing the location of possible lookout towers, observation posts, tool caches, where fire permits will be necessary to protect the timber from settlers clearing fires, and where the public opinion is so far advanced as to give excellent fire protection at the present time without further development. Our reports will show where debris has accumulated near public highways, railroads and settlements, which should be burned in order to avoid a great fire risk to even human life as well as property. You will see from this that the Forest map of New Brunswick will undoubtedly be of greatest value in planning a comprehensive and efficient fire protection system.

Mapping by Aeroplane.

The great development in the use of the so-called "flying machine" during the last four years gives rise to the expectation that most of our forest fire patrol work will eventually be done by this method, and further it is not unreasonable to expect that before our survey is completed many of our rivers and lakes will be mapped by the highly developed aerial photography.

The figures already compiled by the Forest Survey have shown an enormous loss to the Province of New Brunswick by forest fires. This startling fact, together with the active influence of the Canadian Forestry Association and the Commission of Conservation, resulted in the passing of the new Forest Fires law which was designed to assist in preventing the recurrence of so great a national disaster.

The Fire Permit system of regulating settlers burning slash as provided under the new fire law is recognized as one of the most important advances in Forest Protection and although this law was in force for only a short time during the past

fire season it has given excellent results.

Cutting out Politics.

The Government early recognized that without a permanent, properly disciplined and efficient field staff of Forest Rangers, unhampered by the influence of politics, very little could be accomplished by way of fire protection and forest conservation, consequently the 1918 Forest Act was passed, providing for a Forestry Advisory Commission of five members, consisting of the Minister of Lands and Mines, Deputy Minister, Provincial Forester and two others,—one elected by the Crown Land licensees and one chosen by the Minister to represent the granted forest land owners. This Advisory Board has the power to make all permanent appointments and to supervise all matters in relation to the Forest Act.

This Advisory Board has had several meetings and the results obtained have shown the wisdom of its creation. The practical contributions to the deliberations of this Board by the two representatives of the lumbermen of the Province has been invaluable. Among the Board's first duties was the appointing of an examining committee to carry out the Act in relation to the appointment of rangers by competitive examination on a merit basis. The rangers' duties include forest fire protection, sealing of the logs cut from Crown Lands, and the protection of game.

The Board of Examiners was made up of three members, the Provincial Forester as Chairman, an expert scaler and a practical woodsman and lumberman. The examination consisted of a written test on Forest Ranging, Fire Protection, Game Protection and Sealing, an oral test, and, most important, an actual scale of a large number of logs by the applicant. The examination was modeled after the U. S. Forest Service Examination through the kindness of the U. S. Civil Service Commissioners.

It is very interesting to note that of the 151 men examined only 76 qualified. The large number that

failed to qualify was due to the fact that many men lacked sufficient experience as scalers. The Government is entitled to great credit in view of the fact that the appointment of the Forest Rangers and Inspectors has been practically completed from the pass lists on a merit basis, irrespective of any political influence or patronage.

Through the continued co-operation of the New Brunswick Government with the Railway Commission of Canada, the work of fire protection along railway right of ways was continued with beneficial results, and it is worthy to note that it was the first year that systematic inspection of the fire protective appliances on locomotives was carried out by the Provincial Inspectors in New Brunswick.

Fewer Railway Fires.

The co-operation between the New Brunswick Government and the Canadian Government Railways in regard to fire prevention has been considerably extended. The concession of the General Manager of this Railway to the New Brunswick Government's inspectors to examine their locomotives for fire protective appliances, the appointing by the railway of an ex-locomotive engineer to devote his whole time to locomotive inspection in New Brunswick, and the issuing of a circular by the General Manager to all employees of the C. G.R., outlining their duties in regard to forest fires long practically the same lines as railways do under the Railway Commission, resulted in considerable improvement in the fire situation; nevertheless it is felt that much better results can be obtained if the Canadian Government Railways were placed under the jurisdiction of the Railway Commission of Canada. Considerable improvement in fire protection along private railways in New Brunswick has been secured by close inspection and considerable pressure brought to bear on their managers—one railroad was forbidden to operate trains until engines were properly equipped and fire patrol established.

The necessity of this work and its great importance will be seen when it is stated that a very large percentage of the locomotives examined had serious defects in their fire protective appliances, which were immediately remedied at the request of our Inspector. The seriousness of the forest fire hazard along railroads is easily realized when it is stated that over 788 fires occurring from the smokestacks and ashpans of locomotives, operating through the forests were extinguished by our patrolmen during 1918.

Public Sentiment Improved

Considerable improvement in general fire protection throughout the province and greater interest by the public has been noted, due to a considerable extent to the educative propaganda recently adopted. Over 15,000 attractive and warning posters were placed throughout the Province. The Press was used to a large extent. Through co-operation with the Board of Education, circulars on fire protection were read in 1500 country schools by the teachers, and the children urged to be careful with fire in the woods. Five hundred (500) fire protection posters were placed in railway smoking cars through the permission of the railroads. One thousand circulars on slash burning were distributed. Over 100 various interesting slides on fire protection were distributed and shown in many of the forty motion picture houses in the Province. Envelopes for all correspondence carried fire protection data during the fire season; several thousand pocket whetstones carrying fire protection information were distributed to woodsmen, hunters and fishermen; a course of ten lectures on the Crown Lands was given to the Provincial Normal School students last year, and it is considered that this brought beneficial results, and it is probably that the course will be continued; 1000 copies of the Fire Act were distributed,—the whole tending to create a healthy sentiment regarding the importance of fire protection. The need of all this publicity is fully justified when the following sum-

mary of the fires reported is considered.

The above tabulations show that over 80 per cent. of the damage done was caused by the carelessness of fishermen, campers, hunters and smokers neglecting their camp fires or throwing away burning matches, and by the railroads through defects in the fire protective appliances on their locomotives.

It is therefore absolutely essential that carefulness with fire, and a proper appreciation of this our greatest national resource, should be so impressed on the minds of our citizens, especially those whose business or pleasure takes them within the forests, that in the near future the neglected camp fire will become unknown, and forest fires will no longer destroy the people's heritage.

Railway fires: 788 of which 759 were on Government-owned roads. Total damage \$2606. Area burned 637 acres.

	No. of fires	Estimated damage	Acreage burned
Fishermen, hunters, campers, picnic parties, neglecting camp fires.	29	\$55817	17874
Settlers burning slash	15	8950	18t
Industrial operations	5	2743	62
Unknown causes	10	2150	318
Incendiary	3		4
Grand Total	850	\$72266	19080

WIRELESS FOR FOREST FIRES.

Dunwoody Institute, Minneapolis, on October 13th, volunteered the use of its wireless plant in maintaining communication with Duluth, should other sources be broken by the forest fires. Dunwoody has the only authorized radio plant in the state, except the Government station at Duluth. It has been able to maintain the station only through the fact that naval operators have been trained at the institute.

Nova Scotia Getting Ready!

Campaign for Provincial Forester Strengthened by Recent Conference at Halifax.

A public conference on Nova Scotia's forest problems and the need of a Provincial Forester was held at the Parliament Buildings, Halifax, on December 10th under the auspices of the Canadian Forestry Association. There were present about forty representatives of various provincial interests, including the Dominion Coal Company, the Nova Scotia Steel and Coal Company, the Davison Lumber and Manufacturing Company, S. H. Dunfield and Company, the Fraser Companies Limited, the Dominion Atlantic Railway, Mr. McKeen, Mr. Musgrave, S. M. Brookfield, Dr. Howard Murray, President of Dalhousie University, Prof. Blair, F. C. Whitman, and many others delegated by lumber companies, or concerned as private citizens. There were also present Mr. Clyde Leavitt, Chief Forester of the Commission of Conservation, Mr. Ellwood Wilson, Chief Forester of the Laurentide Company, Mr. G. H. Prince, Chief Forester of New Brunswick, and Mr. Robson Black, Secretary of the Canadian Forestry Association. Mr. Whitman acted as Chairman of the meeting and both sessions were favored by the presence and active participation of Hon. O. T. Daniels, Attorney General and Commissioner of Lands.

The Financial Question.

The immediate consequence of the meeting was that Mr. Whitman was asked to select a committee so as to further the objects of the meeting and place before the Provincial Government a concrete proposal expressing not only the reasons for the appointment of a Provincial Forester but outlining a plan whereby the financial cost of such a new office could be met.

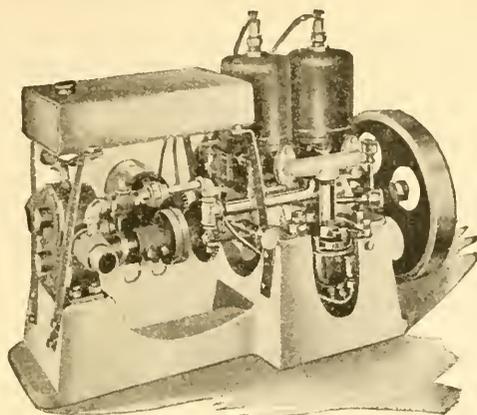
Various speakers gave the meeting their opinions as to the precarious state of Nova Scotia's timber supply.

For example, Mr. J. W. Revere, buyer of pit props for the Dominion Coal Company, during the past 25 years, and Mr. A. M. Seeley, acting in a similar capacity for the Nova Scotia Steel and Coal Company, gave a detailed and, at the same time, alarming resume of the difficulties besetting the coal companies in securing timbers within reasonable distances of the mines. Lumber buyers, as Mr. Musgrave and Mr. McKeen, declared that difficulties were now almost insurmountable in obtaining the sizes called for in orders. Other speakers, drawing upon practical experience in wood using industries, strongly advocated the appointment of a Provincial Forester and an organized fight against timber waste through fire and unwise cutting. Emphasis was given to the service that a Provincial officer could render to the small woodlot owners.

Hon. Mr. Daniel's Reply.

After hearing the views of the conference, Hon. Mr. Daniels, spoke of the comprehensive nature of the present Nova Scotia Forest Fires Act and declared that the appointment of rangers had been kept entirely free from political influence. He did not directly question the value of a Provincial Forester but said that such an appointment depended upon the Government's ability to pay the upkeep of a new office. With an annual deficit and all avenues of taxation occupied, he did not see how the Treasury was to pay the proposed Provincial Forester. Mr. Daniels made it plain that he welcomed the propaganda to arouse public sentiment to the need of forest conservation.

Discussing the working of the present system of County fire wardens, the Attorney-General remarked that the forest fire loss in 1918



FAIRBANKS - MORSE FIRE FIGHTING ENGINES

These compact powerful little pumping outfits have repeatedly substantiated our claims during the past year, all over Canada.

They can be readily transported wherever man or pack horse can go.

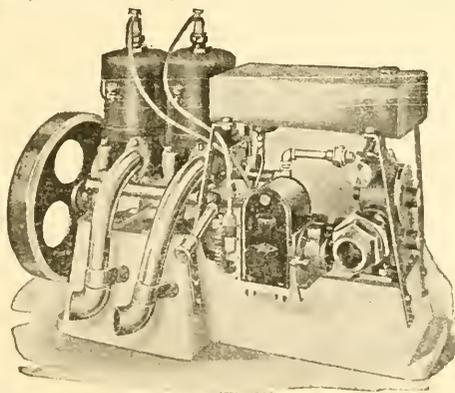
Governments and Private Owners of Forests everywhere, can materially reduce their fire losses by the use of these outfits.

Full information and prices on request.

THE CANADIAN FAIRBANKS - MORSE CO., Limited

MONTREAL - OTTAWA

ST. JOHN, QUEBEC, TORONTO, HAMILTON, WINDSOR,
WINNIPEG, SASKATOON, CALGARY, VANCOUVER, VICTORIA.



amounted to \$92,975, of which \$60,-545 was due to Government railway fires; \$3,750 was spent on fire fighting and 57,558 acres were burned over.

The meeting gathered from the remarks of Hon. Mr. Daniels that if the special committee of the conference could suggest a plan whereby the salary and expenses of the Provincial Forester could be paid, the co-operation of the Government could be counted upon to give effect to this new branch of administration.

Nova Scotia's Real Task.

Mr. Whitman, in opening the meeting, reviewed the excellent spade work done by the Western Nova Scotia Lumbermen's Association in developing the present Fire Act and securing the appointment of County Wardens. On the forest lands where fifteen years ago an export trade of 150 million feet a year was built, very little mature timber was now growing. Taking Western Nova Scotia as a whole, the task had become one of growing timber before operations could be resumed. Coincident with the decline of timber production on the non-agricultural areas of the province there had been a marked increase in the price of lumber, therein doubly emphasizing Nova Scotia's loss. The increase in value of timber was so great that investors were now buying cut-over lands to hold for speculative profit. One man in the Annapolis Valley held 155,000 acres, said Mr. Whitman.

The Chairman gave an outline of the dependence of numerous Nova Scotia towns upon contiguous timber areas inasmuch as they had very little agricultural land from which to draw sustenance. He then described the Provincial Forester's possibilities of service to practically every commercial activity. Not only could he supervise and direct the fire patrol work of the county rangers but he could work up fire prevention sentiment through education. For the latter highly important duty in forest protection, Nova Scotia now had almost no provision. The Forester could also advise the Government in the most efficient handling of the

remaining Crown Lands and would be at the service of all limit holders and woodlot owners in improving the productiveness of their holdings.

Mr. Robson Black, Secretary of the Canadian Forestry Association reviewed the efforts of the Association to awaken public sentiment on the need for a forward Provincial policy in timber conservation. Hundreds of private citizens, lumber companies, coal companies, ship-builders, etc., had addressed appeals to the Government to appoint a Forester and give him adequate support. Ten public meetings had been held in October by the Association. Many Boards of Trade had considered the question and notified the Government of their favorable opinion.

Mr. S. M. Brookfield, a well-known builder, expressed the belief that enough time had elapsed already without meeting the timber situation squarely. He was strongly in favor of the immediate appointment of a Forester.

Dr. Howard Murray, President of Dalhousie University, added his support to the objects of the conference.

Mr. G. H. Prince, Chief Forester of New Brunswick, who was invited to be present, gave a comprehensive description of the excellent work accomplished by the new Forest Service organized last year. He stressed particularly the value of the Forest Survey in order to give the Government an intelligent working plan for fire protection, timber sales, and land settlement. Ranger appointments had been held strictly free from political influence by a Forestry Advisory Board. Mr. Prince placed great importance upon the proper organization of the fire protection service and the use of educational means for prevention of loss.

Mr. Ellwood Wilson, Chief Forester of the Laurentide Company, told of the world-wide and rapidly growing interest in proper forest management. Forest protection had now become a specialist's job, demanding the keenest standards of

efficiency in personnel and organization. The old days of unsystematic patrol were now intolerable. As the tabulating of timber losses became more and more accurate, people were beginning to see the money-saving qualities of timber guarding. Mr. Wilson showed that Nova Scotia offered a relatively easy proposition in fire protection, but that fact did not release the Province from its responsibility for adopting the only adequate protective scheme that experience had yet uncovered.

The Coal Companies' Side

Mr. J. W. Revere, of the Dominion Coal Company, gave many facts concerning the troubles of the coal companies in getting a pit prop supply. The present output of 3,500,000 tons required 1,200,000 pieces of pit props annually. Mr. A. M. Seeley, of the Nova Scotia Steel and Coal Company strongly reinforced Mr. Revere's warning.

Mr. Clyde Leavitt, Chief Forester of the Commission of Conservation, said that if the non-agricultural lands of Nova Scotia were not now growing timber, the wealth producing possibilities of the province were greatly reduced. The chief problem facing the province was to grow a new crop on its forest areas. The management of timber resources could not be left to chance. All other provinces owning forest properties found a carefully organized Forest Service essential; the need was no less in Nova Scotia. Fire protection would have to be organized if a new growth was to come up. While recognizing the financial limitations of the Provincial Treasury and the marked difference between New Brunswick with handsome Crown Lands revenues and Nova Scotia with very meagre Crown Lands income, Mr. Leavitt did not see how the latter province could profitably postpone remedial action when every provincial activity was suffering and was bound to suffer more from neglect of a basic resource. Mr. Leavitt summoned many convincing arguments for the engaging of a Provincial Forester and mentioned

the especially valuable consequences of co-operation of such an officer with the Board of Railway Commissioners in lessening railway fires.

A Ground Plan Now Ready.

Mr. Whitman brought out the point that Nova Scotia, like New Brunswick, has a Forest Survey (made by Dr. Fernow and party in 1909-10) which would be a ground plan for the Provincial Forester's organization.

Mr. McL. Robertson, representing the Davison Lumber and Manufacturing Company, spoke strongly in favor of having a Forester who could organize fire protection and assist all woodland owners in increasing the production of timber.

A vote of thanks was passed to Hon. Mr. Daniels for his courtesies to the Conference.

It is essential to point out that the campaigns hitherto carried on by the Canadian Forestry Association to promote public interest in protection of Nova Scotia's forests will be continued even more vigorously than before. The main effort is now to band together all lumbermen, pulp mill owners, shipbuilders, fishing companies, coal mine operators, and others with a direct or indirect interest in local timber supplies to supply an answer to the Government's query: "Where will the revenues come from for the support of a Provincial Forester?"

Not only must this point be answered, but the influence of the Special Committee will be so brought to bear upon the members of the legislature and the cabinet as to make further postponement of action inexpedient.

The Forestry Journal will be sent to any address in Canada for One Dollar a Year.

Airplanes Directed by Wireless Phone

Squadrons of American airplanes fighting in France up to the moment of the armistice were manoeuvring under the vocal orders of the squadron commander that reached each pilot by radio telephone.

News of the successful development of this device, hitherto a military secret, though some inkling of it had reached the Germans just before hostilities ceased, is now allowed to become public by John D. Ryan, U. S. director of aircraft production.

"There are some details concerning it which we cannot discuss yet," Mr. Ryan said, "but the radio devices worked out during months of experiment went into actual service some weeks ago. I have myself, standing on the ground, given orders to a squadron flying in the air and watched them manoeuvre accordingly. The

transmission of the voice is clear enough to be heard distinctly through the sound of the airplane motor. It is in every way the most satisfactory means of communicating between planes in the air and from the ground to planes."

Mr. Ryan said he could not discuss the distances over which the radio telephone has worked, but it is known to be a matter of some miles.

W. C. Potter, of the equipment division of the bureau, explained that the idea of the radio telephone was conceived some time ago by a number of experimenters.

"For some months it has been possible in our offices in Washington to hear the airplanes flying miles over the city," he said, "talking to each other and to the ground as they worked out and perfected the device."

PIT TIMBER IN N. S.

The coal mines of Nova Scotia furnish a constant market for mine timbers, utilizing an average of twenty-two million feet yearly. These include pit props of spruce or fir five feet long and five inches at the small end. The average price for these is about one and one-quarter cents per foot. Pit ties from four to five feet long and from four to six inches in diameter fetch from five and one half to twelve cents each. Railway ties of hemlock, six by seven inches and eight feet long bring fifty-five cents each. Booms of black spruce from eleven to seventeen feet long with an eight inch top fetch from sixty cents to ninety-four cents each.

Wood is used in mines in preference to other material because it will give way slowly when subjected to great weight, gradually splintering and cracking, giving the miners warning and a chance to get away. Wood decays rapidly in mines owing to the damp conditions, so it must be replaced often. The chief sources of supply in Nova Scotia are Cumberland, Colchester, the Cape Breton Counties, Guysboro and Antigonish.

MARITIME BARREL SUPPLY

In the western part of Nova Scotia and in all the fishing centres there is an increasing demand for barrel hoops, staves and headings and there the question of an adequate supply of cooperage material is of equal importance to that of fuel. Such material that formerly came from the waste stock of the large saw mills has lately been very much curtailed and in future more dependence must be placed on direct production and manufacture where the wood is grown. Accessibility is a prime factor in this industry and consequently a sufficient supply of cooperage material depends largely on the quantity the farmers can furnish. The practise of a yearly cut of hoop poles is recommended, with the object of getting regular crops. This practise also allows the smaller trees to grow to a proper hoop size and prevents overgrowth that is unsuitable for cooperage and yet of little value as fuel.—From "The Farm Woodlot in Nova Scotia."

An Improved Forestry Journal.

The January issue of the Canadian Forestry Journal will take a step forward. Henceforth the Journal will be printed on the finest grade of coated paper, which will bring out in their full values all illustrations and at the same time will render the text more readable.

The pages will be slightly larger and a feature will be made of interesting pictures.

The quality of contents, too, will be given special attention. The January issue will be headed by a special article written by Sir George E. Foster on "Forest Conservation and Canada's Trade Abroad."

"What the Canadian Tree gave to the War." is a unique story in which every reader will be much interested. It recounts the unsuspected service of the Canadian forest in making the Allied victory possible.

Mr. Gifford Pinchot, former Chief Forester of the United States, has written an inspiring message to Canadians identifying Forestry as one of the great planks in national readjustment.

Westerners will find special interest in two special articles telling of the remarkable service of forest protection in irrigating British Columbia's fruit-growing valleys, and the good work done at the Saskatoon forest nursery of the Dominion Forestry Branch.

Hon. E. A. Smith, Minister of Lands of New Brunswick has written a strong message on "The State's Responsibility in Forest Management."

Mr. Ellwood Wilson, Chief Forester of the Laurentide Company contributes a timely and stimulating discussion of "Forestry and Reconstruction."

Each month's issue hereafter will contain a special article telling how the tree is "fabricated" into such products as matches, alcohol, etc., with plenty of good illustrations.

The Forestry Journal during 1919 will prove a considerably more expensive product to the Association than previously, but the great growth of membership amply justifies the move.

Lumbermen Co-operate for World Trade

Co-operation to the fullest possible extent, confidence in themselves and in the future of industry were the keynotes expressed at the executive meeting of the Canadian Lumbermen's Association held at Montreal on November 26th. The meeting was one of the most largely attended, ever held by the directors of this organization. W. G. Powers, president, was able to enthuse the directors with his own courage and optimism and as a result of the meeting the Canadian Lumbermen's Association and affiliated organizations are going out to capture a larger share of the world's business.

By coincidence the Eastern Spruce Manufacturers' Association met in Montreal on the same date and on invitation of the Lumbermen's Association the spruce dealers attended the gathering and discussed their common problems together. As a result of this conference thirty members of the Spruce association from Maritime provinces joined the Canadian Lumbermen's Association. The directors of the association decided to hold their next annual meeting at St. John, N.B. Many questions were discussed at the gathering including such matters as domestic consumption of lumber, trade with the

United States and with devastated countries of Europe, transportation matters, embargoes, labor, etc. Resolutions were passed urging the necessity of immediate co-operation between the Canadian Lumbermen's Association and other organizations having to do with forest products, the provincial governments and their forestry departments and the Federal Government. It is was felt that the present situation as well as future development of industry required the closest possible co-operation between all interested parties.

The resolutions ask not only for Federal and provincial assistance of a financial nature, but also in the matter of organization and moral support. The plan is to have one representative in a European country instead of half a dozen or more representing separate provinces or separate branches of industry. In

the opinion of the association directors, lumber for reconstruction purposes ranks next in importance to food, while demand for lumber together with decreased production means that prices will remain on a high level for some years.

Other matters discussed had to do with standardization of their product, also the formation of soldier's employment bureau and other measures for taking up slackness in labor caused by the closing down of munition plants. The association went on record as being willing to co-operate in every possible way with the Government in its efforts to assist in the readjustment period following the coming of peace. Altogether the meeting marks a new era in history of the Canadian lumbering industry. Plans for the future developments were of a comprehensive and far reaching nature.

Replanting Barren Lands in Canada

In all the provinces of Canada, there are large areas of non-agricultural lands which have been so completely denuded of forests by unwise methods of cutting, or by fire, or both, that they are in a wholly unproductive condition, due to the complete destruction of all young growth and seed trees. Only by planting can such lands be restored to productivity within any reasonable length of time and, thus, be made to play their proper part in the economic life of the country.

Nowhere in Canada has such an excellent start been made toward commercial forest planting as in the province of Quebec, and even here the work done constitutes only a small beginning, in comparison with the real needs of the situation. The lead in this direction has been taken by the Laurentide Company, and the Riordon Pulp and Paper Company. Both companies have, for some time, realized the slow progress which nature, unaided, makes toward restoring

the stand of commercially valuable pulpwood species on our northern lands after they have been heavily cut over.

The Laurentide Co. is the pioneer having commenced planting operations in 1908. Up to the present, a total of 453 acres has been planted up by this company, mostly with Norway spruce and white spruce, with a smaller representation of white pine, Scotch pine, red pine, poplar and other minor species. About 1,500 trees are planted to the acre, so that the total number planted to date aggregates some 680,000. During 1919, the Forestry Division of the Laurentide Co. expects to plant about 500,000 young trees, mostly Norway spruce and white spruce. The programme for 1920 includes the planting of 700,000 trees, and, for 1921, 1,000,000 trees, mostly white spruce. The rate of planting is to be increased until it totals 2,000,000 trees per year. C. L.

THE WESTERN FOREST.

Hon. J. A. Calder, Minister of Immigration and Colonization, has given out the following statement dealing with the question of the natural resources of the western provinces:—

“Numerous statements are appearing in the press of western Canada to the effect that the Federal Government has refused to deal with the question of the transfer of the natural resources to the Prairie Provinces. Those responsible for these statements must know that they do not represent the existing situation as regards this problem. Briefly stated, the following are the facts:—

“Early in the year it was decided by Sir Robert Borden, upon the request of Premiers Norris, Martin and Stewart, that the question of the transfer of their resources would be made the subject of discussion at a general provincial conference to be held later in the year, which conference was finally held last month.

“At the conference it was clearly intimated that the Federal Government agreed with the principle of the transfer of the resources, and the whole discussion proceeded along the line of endeavouring to arrive at an agreement on the terms and conditions under which the transfer might be made. All the provinces of Canada, except the Prairie Provinces, maintained that they had an interest in the matter, and that the Prairie Provinces should not be permitted to retain their grants in lieu of land and at the same time have transferred to them their natural resources as well.

“Tentative suggestions were made by the Federal Government to the effect that it might be advisable for the Dominion to retain control and ownership of the forest reserves, national parks, and water-powers, and that in the public interest some provision might be made whereby the Federal Government in the future, if it so desired, could secure limited collieries. These were merely suggestions for discussion. *

“At the close of the conference it

was apparent the representatives of the provinces could not agree, and finally the Prairie Provinces, the Eastern Provinces, and British Columbia submitted their views as to the question either by formal resolution or statement.

“As yet the Federal Government has reached no decision regarding the final settlement of the question. The matter is still under consideration, and the purpose of the Government is to endeavour to find an equitable solution of the problem. Any policy which may be formulated must of necessity be submitted to and approved by Parliament. The Government itself cannot decide a question of this nature.

MAKING BUTTONS FROM WOOD

The wooden button industry in the United States has received a decided impetus, as a result of the activities of the Government in the prosecution of the war, according to a bulletin just issued by the United States Tariff Commission. The centre of this industry is in Providence, R.I., although some wooden buttons are being made in other New England cities.

Before the war the industry had an extensive foreign trade, exports going to England, Germany, France, Belgium, Austria and South America. England was perhaps the largest customer until shipments ceased, as a result of Great Britain placing an embargo on the enameled wooden button.

White birch from the forests of New England provides the raw material for manufacturing these wooden buttons. The trees are cut in the winter and the logs are sawed at the mills into squares four feet long, each side measuring from $\frac{1}{2}$ to 4 inches, the squares differing in size. They are seasoned or cured for about six months so that the wood may be worked into all shapes. At the factories these squares are known as “Spool Stock.”

THE UNIVERSITY OF TORONTO

AND

UNIVERSITY COLLEGE

WITH WHICH ARE FEDERATED

ST. MICHAEL'S, TRINITY and VICTORIA COLLEGES

Faculties of

ARTS

MUSIC

MEDICINE

EDUCATION

APPLIED SCIENCE

FORESTRY

Departments of

HOUSEHOLD SCIENCE

SOCIAL SERVICE

For information, apply to the Registrar of the University, or to the Secretaries of the respective Faculties.

IN DEFENCE OF THE CROW

(A letter in the Manitoba Free Press.

Sir—I trust you will pardon me for again taking issue with you relating to the preservations of our game and wild birds generally. In the present instance under the heading "Corvovs the Malefactor" you print in your issue of the 16th, a very severe denunciation of the crow which might well leave your readers under the impression that this bird is wholly obnoxious. The article is obviously written by one who views the question entirely from the view of the sportsman; forgetting, apparently, that there is another side equally important, namely the bird's relation to agriculture.

The crow, as is well known, is a native of North America. It has, therefore, existed side by side with the various species of grouse long before man settled in these parts. Yet the grouse survived in abundance. That the crow has increased in late years is possible, but that it occurred

P. L. BUTTRICK

CONSULTING FORESTER

NEW HAVEN, CONN., U. S. A.

P. O. BOX 607

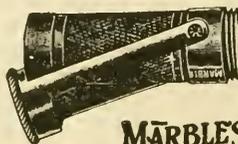
TIMBER ESTIMATES

UTILIZATION STUDIES

PLANTING PLANS

Landscape and General Forestry Work.

Eight years experience in practical forestry work of all sorts.



Dry Matches

After all day in a boat, rainstorm or wet snow. Ask your dealer for

MARBLE'S WATERPROOF MATCH BOX

If he can't supply you, we will send prepaid for his name and 50 cents. Dry matches may save your life.

MARBLE ARMS MFG. Co.
Dept. 5160 Gladstone, Mich., U.S.A.

**CONFEDERATION
LIFE
ASSOCIATION
UNCONDITIONAL
ACCUMULATION
POLICIES**

Are liberal up-to-date contracts which guarantee to the insured every benefit consistent with safety.

Write for Particulars which will gladly be furnished by any representative of the company or the
HEAD OFFICE, TORONTO



**QUEEN'S
UNIVERSITY**

KINGSTON
ONTARIO

**ARTS MEDICINE
EDUCATION
APPLIED SCIENCE**

Mining, Chemical, Civil, Mechanical and Electrical Engineering.

HOME STUDY

Arts Course by correspondence. Degree with one year's attendance.

Summer School July and August. **Navigation School** December to April.

GEO. Y. CHOWN,
Registrar.

MINIATURE CONSTRUCTION

Landscape, Mechanical and Architectural Models, Topographical Maps and Paintings. for

SCHOOLS — COLLEGES — MUSEUMS
Government work a specialty

**MORGAN BROS. CO., Inc.
MODEL MAKERS**

Room 1650 Grand Central Terminal
Phone 7720 Murray Hill
NEW YORK CITY

**UNIVERSITY OF
NEW BRUNSWICK**

FREDERICTON, N.B.

DEPARTMENT OF FORESTRY
Established in 1908

Best of facilities for definite instruction and supervision in Practical Forestry.

Surveying, cruising and construction work carried on in our own tract of 3600 acres, with Forestry Camp in the centre.

Competent men from the School at present in demand to take up Forest Survey work with the Provincial Crown Land Department.

For further information address :

DEPARTMENT OF FORESTRY

University Calendar furnished on application.

C. C. JONES, Chancellor.

R. O. SWEEZEY

(B. Sc., M. E. I. C.)

Water Powers. Timber Lands.

FINANCING

164 St. James St. **MONTREAL.**

in its thousands even in 1882 is manifest on reference to Thompson Seton's "Birds of Manitoba." Still, as we said before the grouse survived. Surely the inference is obvious. It was not the crow but man who upset the balance nature had provided.

It is impossible here to go into details as to the crow's actual economic standing and also unnecessary when the work has been done so thoroughly by the U.S. Biological Survey. See Bulletin No. 621 "The Crow and its Relations to Man." This is a work that all should possess who wish to gain the real facts. It is for sale by the Superintendent of Documents, Govt. Printing Office, Washington, D.C., at 15 cents. This work is one of very wide application, and is the result of a very comprehensive weighing of evidence, both from the examination of stomachs and field observations. The evidence provided includes many crow

stomachs collected by my brother Stuart, in Manitoba, a single one of which contained no less than 45 white grubs, an insect recognized as extremely noxious. However, my object is to call attention to this work not to quote it. I think when it has been read impartially that the reader will conclude that the crow is not quite such a malefactor as you have described it and that while it unquestionably does some harm by destroying eggs and young birds, its value to the farmer, as a consumer of noxious insects, is also worth considering.

Personally, I am still of opinion that an effective carrying out of the law, as it is at present, would in itself be sufficient to re-stock our preserves with the birds which man, with his automobile, has been the chief factor in diminishing.

NORMAN CRIDDLE.

Teesbank, Man., Nov. 23, 1918.

50CTS.

WAR TIME SPECIAL OFFER

ONE WHOLE YEAR

FOR FIFTY CENTS!

We are desirous of adding 1,000 new names to our list this month and to make it a certainty that we will not be disappointed we are offering

ROD AND GUN

IN CANADA

to you and 999 others for Twelve Months for 50 cents.

W. J. TAYLOR LIMITED, Publisher - Woodstock, Ont.

TREES, SHRUBS AND SEEDS

Hardy Northern Trees and Shrubs at Lowest Prices. Native and Foreign Tree Seeds

EDYE-DE-HURST & SON, DENNYHURST

DRYDEN, ONT. Shippers to H. M. Government, Etc. Correspondence Francaise.

Hill's Seedlings and Transplants

ALSO Tree Seeds for Reforesting. Best for over half a century. Immense stock of leading hardy sorts at low prices. Write for price list and mention this magazine.

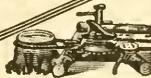
Forest Planters Guide Free.

The D. Hill Nursery Co., Evergreen Specialists
Largest Growers in America.

Box 503 Dundee, Ill., U.S.A.

Try This Stump Puller at Our Risk

The Smith Stump Puller will take out every tree and stump by the roots, clearing from one to three acres a day, doing the work of twenty men. We want you to send for our 3 year guarantee against breakage and our free trial proposition. Address W. Smith Grabber Co. 11 Smith St. LaCrescent, Minn.



YALE UNIVERSITY FOREST SCHOOL

NEW HAVEN, CONNECTICUT, U.S.A.

YALE University Forest School is a graduate department of Yale University. It is the oldest existing forest school in the United States and exceeds any other in the number of its alumni. A general two-year course leading to the degree of Master of Forestry is offered to graduates of universities, colleges and scientific institutions of high standing, and, under exceptional conditions, to men who have had three years of collegiate training including certain prescribed subjects. Men who are not candidates for the degree may enter the school as special students, for work in any of the subjects offered in the regular course, by submitting evidence that will warrant their taking the work to their own advantage and that of the School. Those who have completed a general course in forestry are admitted for research and advanced work in Dendrology, Silviculture, Forest Management, Forest Technology and Lumbering. The regular two-year course begins the first week in July at the School camp, Milford, Pennsylvania

For further information address

JAMES W. TOUMEY, Director
New Haven - Connecticut

Gagnon & Morissette

Lumber Contractors
Timberland Cruisers
Forest Industries

CHICOUTIMI, P.Q.

LT.-COL. L. J. D. MARQUIS

Forest Engineer and Mem. Can. Soc. of F.E.;
Quebec Assoc. of F.E.; Former Mem. Que. F. Service

Forest Cruising and Mapping
Timber Factors and Logging Costs
Facts on Forest Growth and Future Products

90 LOCKWELL AVENUE, - - QUEBEC

R. R. BRADLEY

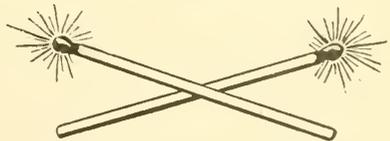
Forest Engineer and Mem. Can. Soc. of F. E.
Consulting Forester to the New Brunswick Railway Co.

Timber and Pulpwood Estimates. Forest Maps. Advice on the Management of Wood Lands. Timber lands listed for sale.

GLOBE ATLANTIC BUILDING, ST. JOHN, N.B.

Or P. O. Box No. 5, OTTAWA, Ont.

ASK FOR



PHILLIP T. COOLIDGE FORESTER

Timber Estimating and Mapping.
Supervision of Lumber Contracts.
Surveying. - - Forest Planting.

STETSON BLDG., 31 CENTRAL ST.
BANGOR, MAINE.

HEAVY U. S. LOSS TO FIRE.

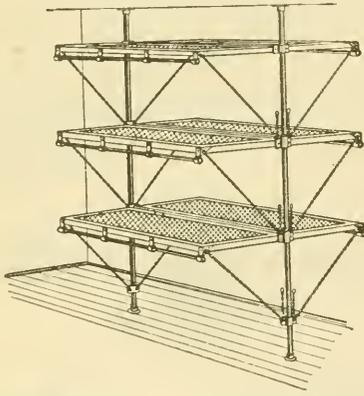
Forest fire losses during the 1918 season on the U. S. Pacific Coast exceeded the three million dollar mark and perhaps reached or passed the four million dollar figure. More than 300,000 acres were burned over and more than three billion feet, board measure, of merchantable timber was damaged, about two-thirds of it beyond salvage.

The fire season lasted so long that reports from many sources are not yet available. Approximate figures on National Forest losses show between 60,000 and 70,000 acres burned over in Oregon and about 75,000 acres in Washington. The loss in the National Forests of Oregon was greater, however, as about 50,000 acres burned over in the Cispus forest tract in Washington was "burned over" land and bore virtually no merchantable timber.

IN NORTH ONTARIO.

In the Cochrane division of the Ontario Forest Protection Service nearly double the number of fire permits over the issue of last season has been made to settlers. Of the total number of rangers in the division 95% have their homes north of North Bay, well illustrating the sensible policy of the Department in employing men with a personal knowledge of and interest in the district where their fire ranging duties lie.

The Forestry Journal will be sent to any address in Canada for One Dollar a Year. . . .

**STEEL BUNKS FOR CAMPS**

Included in the well-known line of DENNISTEEL factory, hospital, camp and ship equipment is the all-steel sanitary bunk illustrated. Take up very little room, are comfortable, hygienic and practically indestructible — a permanent investment. Write for particulars and folders on any of the following lines:

Steel Lockers, Bins, Cabinets, Chairs, Stools, Etc.
Standardized Steel Shelving (knock-down system).
Steel Hospital Equipment. General Builders' Iron-work.
Ornamental Bronze, Iron and Wirework.
Wirework of every description.

**THE DENNIS WIRE AND IRON
WORKS CO. LIMITED**

**LONDON
CANADA**

Hallifax Montreal Ottawa Toronto
Winnipeg Vancouver

The Paper For People Who Would Really Know

Those who are reading **WORLD WIDE** week by week are finding themselves **better informed** as to the thought and doings of these momentous times than those who merely depend on the Daily press; for in **WORLD WIDE** is presented the well considered thought of those who concern themselves with the **Inner meaning** of things rather than with their passing appearance. In **WORLD WIDE** you will find assembled just a few of the **really noteworthy** articles of the week, selected from the most responsible British and American journals and reviews—care being taken to have different points of view represented. Many of these articles have been written or inspired by the **great men of the times**. Sample copies **FREE**; or for five weeks trial for ten cents in stamps, or fifty cents on trial to end of 1918 to new Subscribers. (Regular subscription rates \$2.00.) **JOHN DOUGALL & SON, Publishers, Montreal.**

YOU SHOULD HAVE THESE HELPS!

They contain up-to-date information covering the various branches of forestry, and have been written by men who are recognized as authorities in their respective fields. Your library will be complete with copies of these books.

HANDBOOK FOR RANGERS AND WOODSMEN.

By Jay L. B. Taylor.

A helpful guide to all engaged in woods work, and those whose recreation takes them into rough and unsettled regions. It covers thoroughly the essential problems of woods work, and explains all unusual trade or professional terms.

429 pages, 4¼ x 6¾, 236 figures. Flexible binding, \$2.50 net.

THE THEORY AND PRACTICE OF WORKING PLANS.

Second Edition, Thoroughly Revised.

By A. B. Recknagel, B.A., M.F.

This book is the result of the author's study abroad and the experience gained in years of work for the forest service in various parts of the United States.

279 pages, 6 x 9, illustrated. Cloth, \$2.00 net.

LOGGING.

By Ralph Clement Bryant, F.E., M.A.

This book covers the principles and general methods of operation in the United States.

608 pages, 6 x 9, illustrated. Cloth, \$3.50 net.

FOREST PHYSIOGRAPHY.

By Isaiah Bowman, Ph.D.

Covers the physiography of the United States and principles of soils in relation to forestry.

781 pages, 6 x 9, illustrated. Cloth, \$5.00 net.

FOREST VALUATION.

By Herman Haupt Chapman, M.F.

310 pages, 6 x 9. Cloth, \$2.00 net.

MECHANICAL PROPERTIES OF WOOD.

By Samuel Record, M.A., M.F.

173 pages, 6 x 9, illustrated. Cloth, \$1.75 net.

Canadian Forestry Journal

206-7 Booth Bldg., OTTAWA.



How About Operators?

Prospective users of wireless usually ask us: "But what about operators? Aren't they hard to get?"

The answer is: "Not if you use C & W apparatus."

The old style sets, with their high voltage, low factor of safety and numerous critical adjustments, could be operated only by an expert, with a specialized training,—and such men are hard to get.

But C & W sets have a voltage of only 200 volts as against from 8,000 to 20,000 volts in the old style sets, a factor of safety of ten as against one and a half, and no critical adjustments. These factors make a set so simple, rugged, reliable and easy to operate that anyone who knows the code can operate C & W sets and keep them in operation—and learning the code is a simple matter taking from four to six weeks. If C & W sets are installed in your forests, your wardens can operate them after a short training.

No C & W set has ever broken down in service; the initial cost of a C & W set is about one quarter that of other sets on the market; the upkeep costs are almost negligible; and you can always get operators for C & W sets among your own men.

May we help you solve your problem?
Details and expert advice from our
engineers upon request.

Cutting & Washington, Inc.

1083 Little Building - BOSTON, Mass.



University of Toronto
Library

DO NOT
REMOVE
THE
CARD
FROM
THIS
POCKET

Acme Library Card Pocket
Under Pat. "Ref. Index File"
Made by LIBRARY BUREAU

Author Canadian Forestry Jour
Title 14 - 1918.

DATE.	NAME OF BORROWER
<i>Mar 3/39</i>	<i>E. Bonner</i>
<i>July 2/60</i>	<i>J. W. B. B. B.</i>

