

Canadian Forestry Journal

Vol. XIII.

DECEMBER, 1917

No. 12

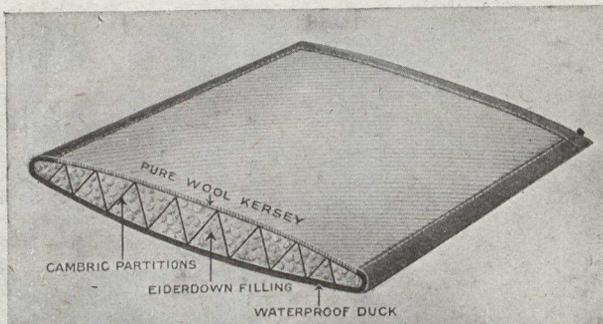


WHEN TANK MEETS TREE, IT IS THE TREE THAT BENDS

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, DECEMBER, 6,500 COPIES

Canadian Forestry Journal

Vol. XIII.

WOODSTOCK, ONT., DECEMBER, 1917

No. 12

CONTENTS FOR DECEMBER

Guarding Ontario's North Land.....	1425
In the Forests of Siberia.....	1428
Forest Strength and Fighting Strength.....	1431
Digging the Grave of Patronage.....	1432
Studying Forestry in the Forest.....	1434
Should Forest Taxes be Levied on Yield.....	1436
Pulp Wood Lands Reforest Slowly.....	1437
Fast-growing White Spruce in Quebec.....	1439
Turning Timber Orders towards Canada.....	1440
The Ghost of the Tree..... Verses.....	1441
Coupling Science to Timber Crops.....	1443
Logging Debris..... An Imperative Problem.....	1445
The Dawn of Science in Lumbering.....	1446
How fast does a Forest Rebuild Itself?.....	1447

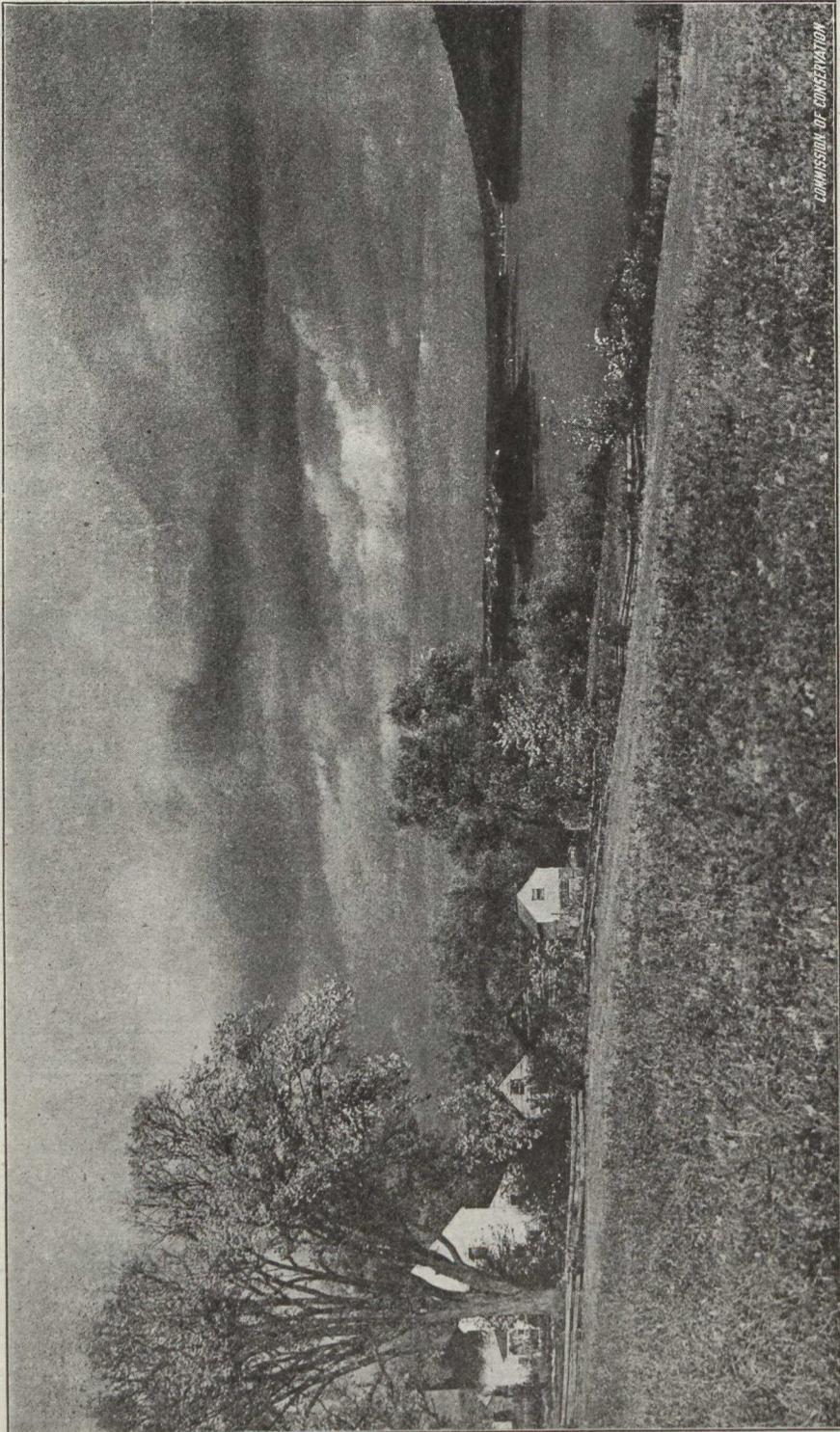
The Canadian Forestry Journal will be sent to any address for one dollar a year, subscription including all other publications of the Canadian Forestry Association.

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.



COMMISSION OF CONSERVATION

An Eastern Canadian Farm, Where Field and Lake and Wooded Shore Make a Delightful Harmony.

Guarding Ontario's Northland

BY E. J. ZAVITZ,

PROVINCIAL FORESTER OF ONTARIO.

Thirty-Five Districts Created, 85 Towers Erected, Over 1000 Rangers Employed.

The Forest Fires Prevention Act passed by the Legislative Assembly of the Province of Ontario in 1917 places the administration of forest fire protection under the Forestry Branch of the Department of Lands, Forests and Mines.

Without going into the details of this new Act it is of interest to point out the new features which are added to Ontario Forest protection. Control of the setting out of fire within forest regions is given through Regulations passed by Order-in-Council. It is necessary between the 15th of April and the 30th of September to obtain a written permit in order to set out fire for the disposal of slash or other debris. This written permit is issued by the fire ranger or other duly authorized official and contains certain restraining conditions. The ranger is given special instructions in reference to the conditions under which the Permit is issued. For example, the ranger may find it advisable to name the exact hour at which burning shall start or that some special protection be provided while burning is being done. The issuance of the permit requires the personal inspection of the ranger.

Another feature of the new Act is the provision for the disposal of fire hazards. Wherever conditions exist which are a menace to life or property the Act provides for definite action by which such danger may be removed.

Field Organization

The forest region of Ontario, subject to the Forest Fire Act, is divided into 35 Districts, each of which is in charge of a Chief Fire Ranger. During the past season we have had 34 Deputy Chiefs assisting the Chief Fire Rangers where areas were large or difficult of access.

The maximum number of rangers for any one period of the past season was 1039.

In addition to the above organization we have had 12 Railway Inspectors, whose duties were to carry out the provisions of Order 107 of the Board of Railway Commissioners for Canada.

For inspection purposes the forest region was divided into three Inspectoral divisions with a Superintendent in charge of each division.

To sum up, during the past season the entire force required in the field, for the carrying on of this work, was 1123 men. You will readily understand that with a territory so large it will require time and experience to work out the most satisfactory field organization.

85 Towers Erected

Forest fire protection cannot rely alone on the ranger or patrol system. The 1000 men in the field as rangers are helpless if not backed up by modern detection methods.

During the past season the lookout tower on high points has been introduced into nearly all of the districts. The Nipigon Reserve had previously adopted this method and found it a great assistance in the detection of fire. During the past season 85 towers have been built at a cost of over \$10,000.00. These towers are permanent structures located so that communication may be had by telephone with outside assistance.

In addition to the permanent tower, rangers are instructed to clean out trails to high vantage points. These observation points frequently command the view over vast areas and are of great assistance in locating fire.

One of the most difficult problems in connection with fire detection is to keep up lines of communication. The look-out tower without communication by wire is of small value. The look-out towers in Nepigon Reserve are tied up to 130 miles of telephone line. We have at present about 200 miles of telephone line available in Forest Reserves. Throughout most of the settlements in the Clay Belt where towers have been built local telephone lines are available. Along some of the railways it will be possible to tie up with the local stations.

This whole question of communication will require special attention. We have not rushed into the construction of telephone lines on a large scale, feeling that more study should be given the problem.

Reaching and Fighting Fire

Locating forest fires is a comparatively simple matter. Reaching them in time to take effective measures is the serious problem. In many of our districts the only way of reaching interior fires is by long canoe routes and trails. However, in such districts fire hazards are usually small owing to the inaccessibility of the territory.

Where roads, navigable water or railways make rapid transportation possible there are various methods to be employed which help in solving the problem.

During the past season we have employed three small power boats along the shores of Georgian Bay. We have larger power boats on Lake of the Woods, Winnipeg River, Lake Nepigon and Lake Temagami. In addition to the above seven power boats we have several outboard motors which are primarily intended to assist Chiefs in covering territory where previously they had long canoe routes on the larger waters.

Using a Fire Boat

The most efficient arrangement to be made with a power boat is such as we have on Lake Nepigon. The boat remains the major portion of the time at a definite headquarters which can

be reached by telephone from the outlying stations and look-outs. This boat is equipped with fire pump and 1000 feet of 1½ inch hose, also other fire fighting equipment and can proceed to a fire with the least possible delay. At present we have three power boats equipped in this manner. On railway lines we have five power motors used for inspection and carrying fire fighting equipment. In patrolling some 80 velocipedes are being used and such mechanical attachments as the Smith motor which are being tested.

Last Spring five motor-trucks were purchased and these are giving good results in the districts where roads are passable.

185 Canoes in Service

This organization carries about \$100,000 worth of equipment. In addition to blankets, canvas buckets and minor equipment, it was necessary to purchase this season 185 canoes at a cost of \$10,000.00; 200 tents at a cost of \$3,000.00; 28 new velocipedes at a cost of \$1500.00.

One of the problems connected with this work is the overhauling and repairing of equipment and its proper storage. This has required the building of central storehouses. Five storehouses have been built and several others leased temporarily.

Record of a Busy Season

Improvement work such as construction of trails, etc., can only be carried out efficiently after the field organization has been perfected. Our organization being less than a year old has much to learn but the following are some of the more important improvements carried out this past Summer.

New fire rangers cabins built.....	44
New docks or boat landings.....	18
Acres of fire hazard burned.....	3356
Miles of old trails and canoe routes cleaned out	1031
Miles of new trails opened.....	514
Fire signs posted	65000

In this connection I will refer to the Permit System. Owing to a very wet season in the Temiskaming country this system was not given a severe

trial. Our rangers issued 3886 Permits and no serious opposition was encountered.

Fire Statistics for 1917.

1. Number of Fires:—

May.....	441
June.....	317
July.....	152
Aug.....	115
Sept.....	66
Total.....	1,091

56.1 per cent. did not exceed 5 acres.

2. Causes of Fires:—

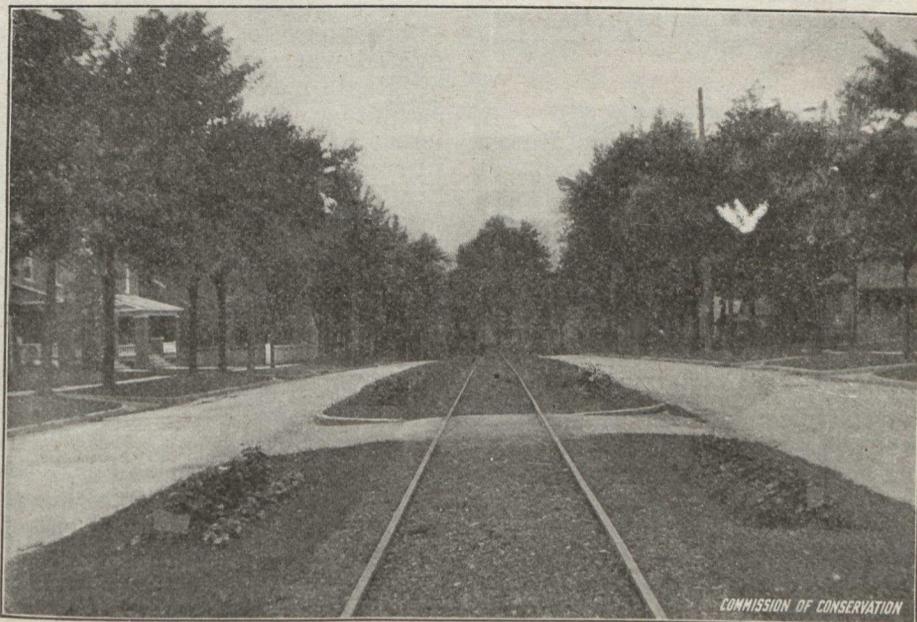
Settlers.....	91
Camp Fires.....	98
Railways.....	541
Lightning.....	28
Indians.....	54
Logging Operations.....	45
Miscellaneous.....	40
Unknown.....	194
Total.....	1,091

Areas Burned

3. Timberland, mainly coniferous.....	71,910
Timberland, mainly hardwood.....	110
Cutover, some coniferous timber left.....	148,368

Cutover, some hardwood timber left.....	2,160
Young growth, mainly coniferous.....	60,625
Young growth, mainly hardwood.....	13,202
Barren.....	82,922
Grassland.....	2,332
Total.....	381,629
4. Ft. B. M.	15,278,000
Cords.....	90,446
Ties.....	781,685
Posts.....	150
Poles.....	125
5. Private property.....	\$2727.00

The forest region of Ontario over which our organization has jurisdiction covers an area of over 100,000,000 acres. The greater part of this region is covered with coniferous growth. Large areas have been cut over leaving inflammable slash. Three transcontinental railways pass through this territory over one thousand miles in length opening it to prospector, timber cruiser and scattered settlement bringing in their wake problems of fire protection. Over 4,000 miles of railways cut through this forest region.



COMMISSION OF CONSERVATION

In The Forests of Siberia

BY L. O. WILGRESS

CANADIAN TRADE COMMISSIONER, OOMSK, SIBERIA

Vast Areas Awaiting Foreign Capital and Enterprise—Government Adheres to Scientific Forestry

The forest wealth of Siberia is a reserve upon which foreign markets will undoubtedly commence to draw in increasing quantities in order to replace the diminishing supplies of timber from other sources. Measures are now being considered whereby the forest resources of this region may be utilized to greater advantage, particularly as regards the development of an export trade abroad in Siberian forest products. The timber trade is regarded as one of the readiest means available for paying off the interest on the public debt of the country and readjusting the balance of trade. This question is of great interest to Canadians, not only in so far as Siberian timber is likely to compete on the United Kingdom and other markets with the products of Canadian industry, but also by reason of the opportunity which will be presented to Canadian manufacturers for the supply of machinery of various kinds.

Much of Siberia Unknown

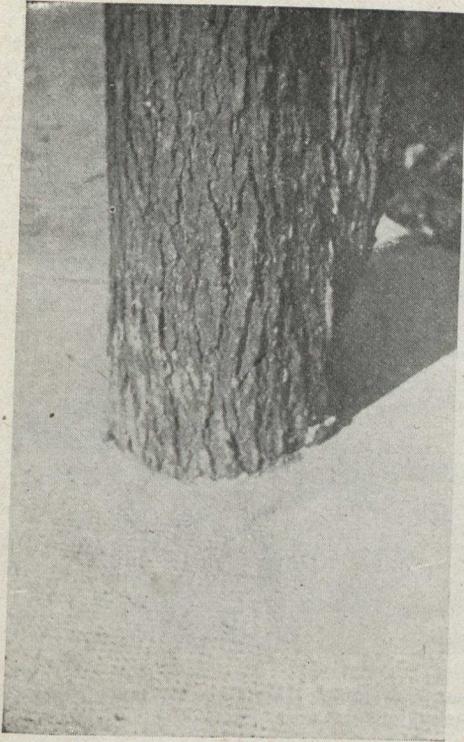
The forest area of Asiatic Russia has been roughly estimated at 853,000,000 acres. The State owns the bulk of the forests of this region, the area amounting to 642,000,000 acres, of which 39 per cent is classed as rich forest lands. In addition the forest possessions of the Imperial Cabinet have comprised an area of 54,000,000 acres, chiefly in the Altai district. These forest lands will now probably be converted into national property, and more attention devoted to the exploitation of their timber wealth. Large tracts of forest land also belong to the Cossacks, particularly along the Amur river in Eastern Siberia.

The largest forest areas of Asiatic

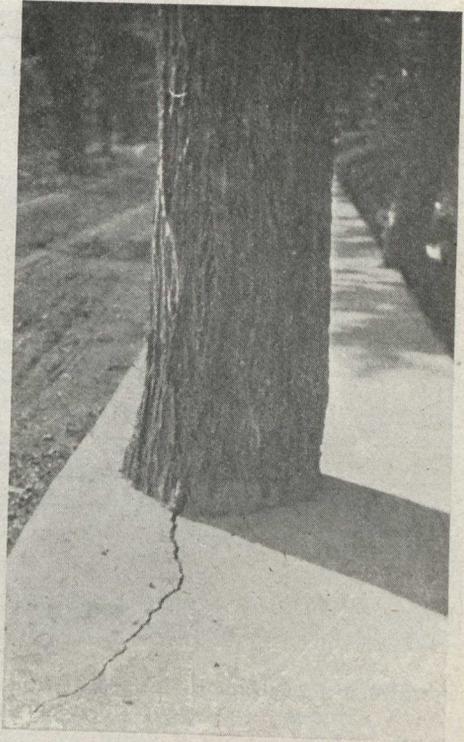
Russia are in the western and eastern regions of Siberia. It is estimated that in that part of Siberia which lies west of lake Baikal there are 465,000,000 acres of virgin forest, and Eastern Siberia, while not so richly endowed, has sufficient timber to supply the requirements of foreign markets for many years to come. A large part of the forest area of Siberia is still unexplored, the resources in number of trees, species and value being unknown. Thus it is estimated that only about a quarter of the whole area had been either wholly or partially investigated by the year 1915. The investigations which have been made, however, have unquestionably established the great value and wealth of these forests, while as regards the exploitation of their timber resources, only a fringe has yet been touched.

Future Prospects

The measures are now being considered whereby the forest resources of Siberia may be exploited to better advantage. For this purpose conferences have been held between those interested in the timber trade and the State departments concerned. It has been realized that in order to increase the timber outputs, a correct system of management of the forests is necessary, together with the organization of the sale of timber. A reliable investigator has stated that with proper exploitation the timber wealth of this region should suffice for the requirements of Western Europe for many generations to come. In order to make possible, however, the shipments abroad of Siberian forest products, a proper organization is required, backed by sufficient capital to enable the adoption of up-to-date extraction methods. An en-



The foreman of this asphaltting job thought this was the correct method of surrounding a tree.



In a few weeks the swelling tree commences to lift the pavement. A costly mistake which could easily have been guarded against. Photos taken on Wilton Crescent, Ottawa.

largement of the existing mills and the creation of new saw-mills will also be necessary, as well as the establishment of other industrial concerns using wood as raw material. Closely related to the question of the organization of the sale of timber is the creation of railways and waterways connecting Siberia with the markets of Western Europe.

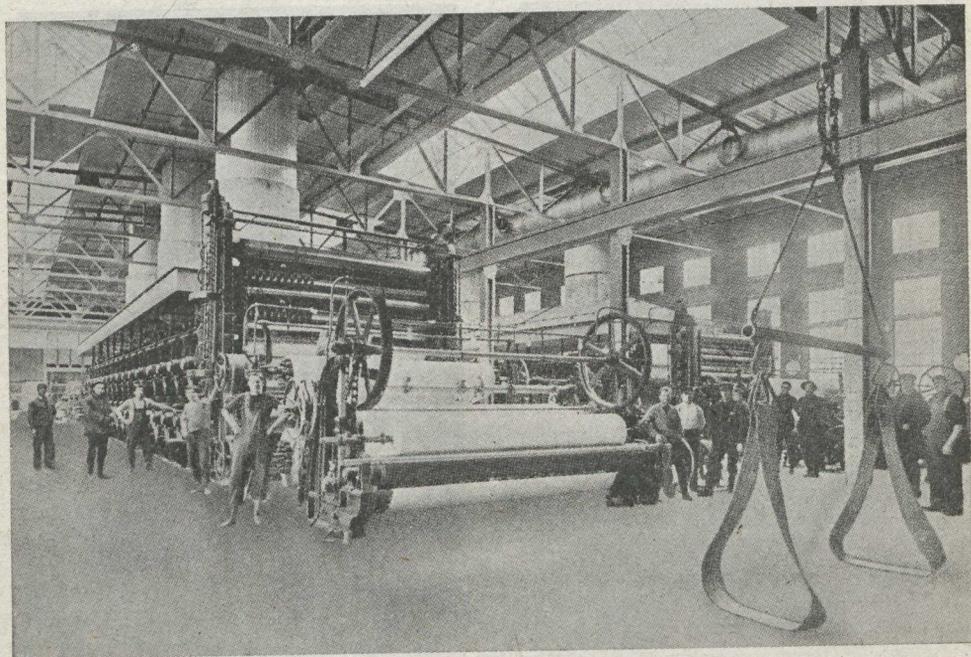
Present Methods of Cutting

The usual practice in Siberia is to fell trees by hand near the rivers. Up to the present practically no use has been made of up-to-date logging appliances. The logs are hauled to the rivers by horses, a great number of men and horses being required for the work. They are either floated down to the mills by rafts or are brought down on barges. The scar-

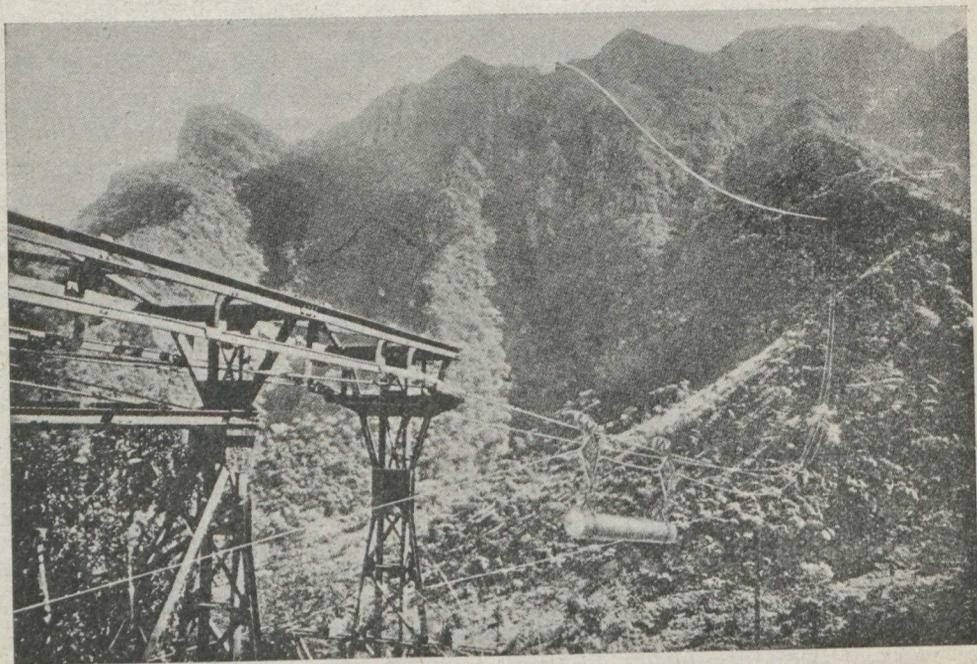
city and high cost of labour at the present time is directing the attention of timber producers to the question of introducing labour-saving appliances. Inquiries are being made for portable hoisting cranes, while it is probable that a demand could also be created for other logging appliances in use on the American Continent such as cableways, stationary engines, tractors, locomotives, etc.

State Control Extended

A plan was adopted before the war for the cutting of timber from the State forests on a large scale. The management of the forest lands belonging to the Government in Siberia has been largely in the hands of the Colonization Department of the Ministry of Agriculture. This department operates several saw-mills and sup-



Whirling through the paper supply of the London Daily Mail. One of the big machines at the Anglo Newfoundland Development Company.



Logging by cable in East Africa. Through this territory the British have gradually driven the German forces until the enormous territory is now officially declared 'free of the enemy.'

plies the peasants and newly arrived immigrants with building materials and other wood products which they require. Although the future position is uncertain, it is probable that the Colonization Department will take

over the forest lands which hitherto have been under the control of the Imperial Cabinet. Little has been done up to the present for the exploitation of the timber wealth of these lands.

Forest Strength and Fighting Strength

BY DR. J. W. TOUMEY, DEAN OF YALE
FOREST SCHOOL

The strength of Germany in the present war has to a large measure been due to her vast reserves of forest capital. If France had not had a forest capital adequate to supply the numerous needs of her vast armies, the powers of central Europe would be in Paris to-day.

Forests For Defence

The world has discovered in this war that forests are necessary for national defence as well as necessary for industrial development and progress.

No country in its progress from barbarism and primitive needs to culture and industrial development, has been able to maintain its forests in a productive condition without organized effort and the execution of extensive plans for reforestation.

Time To Begin Is Now

Although the immediate future supply of wood in this country is secure without giving special attention to reforestation, it is inevitable that it will be deficient both in quality and amount, if we do not, as a nation and as individuals, give more attention now to reforestation and improvement of second growth. One hundred years hence we do not want to say as England is now saying: "Our idle lands must no longer be left unproductive. We must secure that area of home woods which present day necessities make necessary, which the utilization of our national resources and thrift in all departments of life demand and which our posterity is likely to sorely need." We, the United States, do not want to write these words a hundred years

hence. We need not if we begin now to work for the orderly development of the second growth, if we have foresight and sense enough now to plan for the kinds and amounts of timber that we are to cut fifty, seventy-five and a hundred years from now.

Must Plan Long in Advance

The protection and development of the second growth ought to be a prominent question in national, state, and communal councils to-day, while we have abundance of wood. A crop that requires from seventy-five to a hundred and twenty-five years to reach economic maturity, must be planned for long in advance.

MAHOGANY CANOES FOR CANADIAN CAMPAIGNERS

Major John S. Leitch, one of the fire rangers of the Dominion Forestry Branch in Manitoba, who has been overseas from the beginning of the war with the Royal Fusiliers in British East Africa, writes as follows—

"Out in the tropics the majority of rivers can be crossed by a standing jump as it were. Rivers such as Canada has are a great surprise to the tropical man. What canoes are here are dug-outs made by natives out of solid mahogany or teak trees. They take months to make and are very heavy. I have yet to see the first African making a portage with his canoe on his back. Some of these canoes are big enough to take 60 men or 3½ tons of stores."

Digging The Grave of "Patronage"

The avalanche of newspaper condemnation of the patronage system and approval of the Union Government's assurances of its elimination continues in all parts of Canada. Again and again influential dailies and weeklies declare that the interference of the politicians with such technical branches as the Dominion forest service can not again be tolerated. A few excerpts are herewith added to the group published in the November "Journal."

Abolish It

"Abolition of patronage," asserts the Vancouver "World," is heartily welcomed in the technical services of the Federal Government departments. One such service is the Dominion Forestry Branch, which undertakes the protection from fire of enormous areas of forest in the Prairie Provinces and in British Columbia.

Since the formation of the Forestry Branch, the greatest handicap on its usefulness has been political interference with appointments to the field services, these services including not only fire ranging and inspection, but the important work designed to supply western farmers, with shade trees and shelter belts.

"Astronomers and Rangers"

"Very few people in the Dominion would probably be greatly distressed to learn that the royal astronomer knew nothing about astronomy, because it would not affect them a particle, and they regard the whole astronomical department as more or less of a fad," remarks the Toronto "World." "Unfortunately too many people take somewhat the same view of the important forestry work of the Dominion Government. They see no particular harm in any young fellow who wants a vacation being appointed a fire ranger, and some of them probably regard forest protection along the eastern slopes of the Rocky Mountains as more or less unimportant.

The fact is, however, that the forestry service not only guards against fire, but engages in the important tree nursery work designed to provide shade trees for the vast stretches of treeless prairie farms between the Red River and the Rockies. The work done by the men in this department is often technical and always important.

The general public will back up the demand of the Canadian Forestry Association that the civil servants employed in the forestry branch be among the first to be brought under the civil service commission, so that appointments to and promotions in that branch may hereafter be made upon merit, free from political interference.

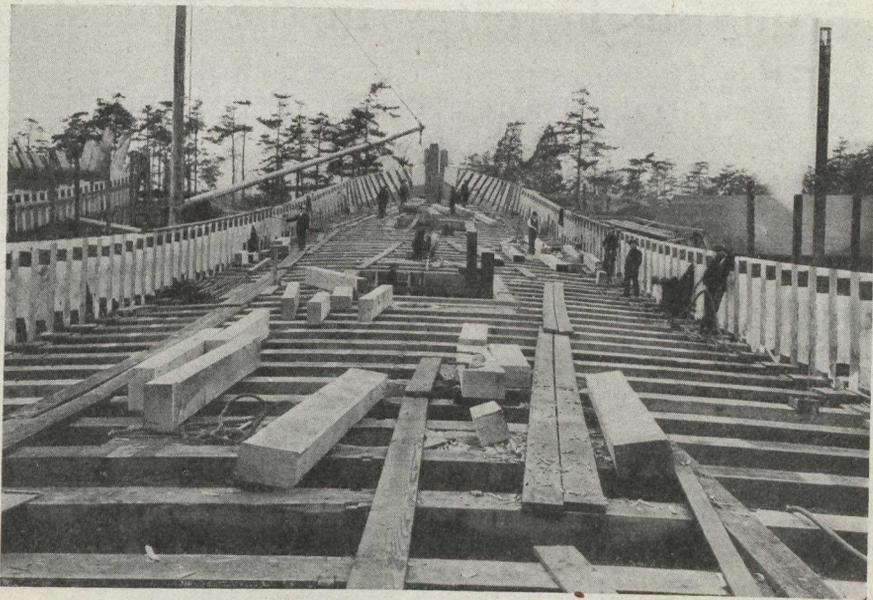
"Cut it Out"

Under the above heading the Halifax Chronicle says in part:

"The Canadian Forestry Association comes forward promptly with the suggestion that a start be made by the abolition of patronage in the matter of appointments in the Outside Service of the Dominion Forestry Branch. . . . It is to be hoped the Government will lose no time in putting its declared policy into operation."

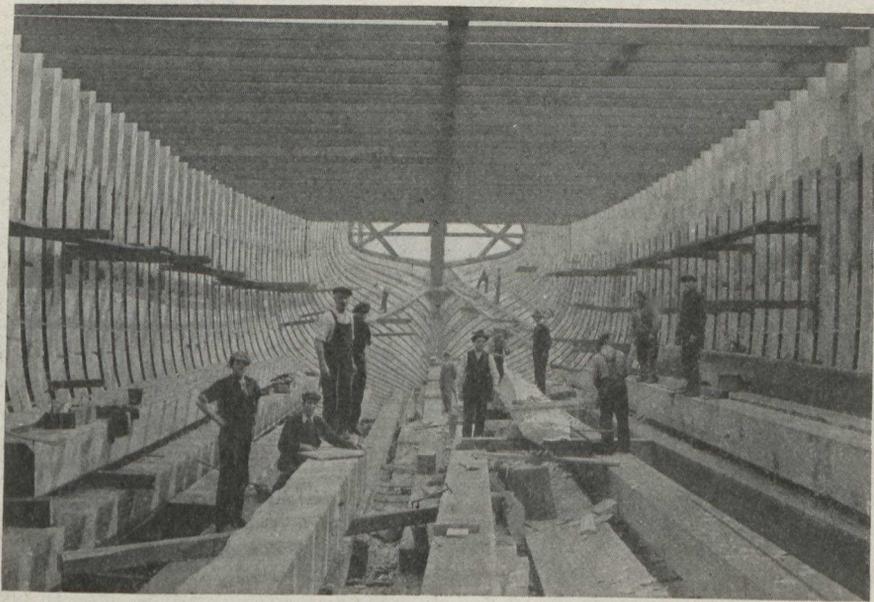
The Blight of Patronage

"The abolition of patronage," says "Canadian Finance," Winnipeg, "and the bringing of the outside civil service under the Civil Service Commission had long been urged in Canada, but no mere party government possessed the courage to make the break. . . . Such a responsibility as devolves upon the Dominion Forestry Branch and other technical services ought to be freed with minimum delay from the blight of the patronage business. If there is to be any gradual introduction of the Civil Service merit plan into the "outside services," the technical departments which suffer most gravely are due for first action."



Shipbuilding in British Columbia.—Deck view of a wooden schooner during construction.

Courtesy "Canada Lumberman."



Shipbuilding in British Columbia.—Looking through the skeleton of one of Canada's new feet of wooden freighters on the Pacific Coast.

Studying Forestry in the Forest

How The Forestry Students of New Brunswick Train Under Woods' Conditions.

One of the interesting forestry enterprises in Eastern Canada is the field work of the Forestry Department of the University of New Brunswick, under Prof. R. B. Miller. This department was inaugurated in 1908 and has enjoyed a steady development with a promise of greater growth in the near future due mainly to the expansion of forestry activities on Crown Lands by the Provincial Government.

Belonging to the University is a tract of about six square miles of timber land. Within the past six years, the value of this tract from two standpoints has begun to be realized—(1) For the production of wood and timber, and (2) as a training ground for forestry students. It should also, as time goes on, possess considerable value as a place for experiment and as a demonstration forest. With these ideas in mind, a beginning at least has been made by the University authorities to protect it from fire and trespass and to so

handle it that its value will be enhanced by wise use and judicious cutting.

It is very accessible to market, has two good sized brooks, not drivable, however, and is penetrated in all directions with woods, roads and trails. According to an estimate made in the spring of 1914 by forestry students the land has an acreage in its various classes as follows:—

	Acres
1. Old clearings and cuttings.....	218
2. Barrens and swamps.....	316
3. Old farms	490
4. Growing timber.....	2616
Total.....	3640

Helping The Woods Spirit

When it was first proposed to build a camp the University Senate considered it a doubtful experiment because no camp three miles from town could long survive. However, it still stands and has done more to stimulate the true woods spirit than any



WOOD CUTTING ON COLLEGE LAND



FELLING TREES FOR STEM ANALYSIS

other part of the equipment. It has taken forestry out of the laboratory and the lecture room and established it where it belongs—in the woods.

The building is 16 x 20 feet inside, of peeled spruce and fir logs, chinked with moss. The tar-paper roof has been recently shingled because woodsmen tell us that a camp enters into senile decay at the top and not through the rotting of its timbers. The total cost of the camp, including hardware and floor, was not over \$25.00, the work being done entirely by the students. So far it has never housed students for a week or two, but its chief use has been as headquarters for work carried on on Saturdays, being within easy walking distance of the University.

How The Camp is Used

The work of the fall term of last year may give some idea of the usefulness of the camp as a center of operations. Juniors were assigned certain 25 acre lots to cruise and make a silvicultural report upon, turning in a topographic and type map of

these lots plotted to a scale of five chains to the inch. They had associated with them the lower classmen, five or more men in a party, the Junior directing the work and looking after instruments, etc. Later on in the fall, felling operations started and they were assigned to work in stem analysis of spruce and fir and volume table work on paper birch, following the choppers. If there were not enough trees down, some went to felling and sawing them up into log lengths, others disposing of the brush and slash, until each tree was properly finished. The next Saturday, perhaps, yarding started and some were put to scaling logs as they were piled. When snow comes they assist in the preparation of the hauling roads and by Christmas have had a chance to learn a variety of things about mensuration and logging. Boys from the city are less expert with the axe and saw and are given special opportunity to learn practical things. They are not kept at one kind of work too long, but long enough to learn how it is done.

Tree Studies

In the spring, after the snow had

acquired a crust, work was resumed in estimating plots by the sample tree methods, determining growth per cent. of felled trees and sample plots, the data secured being worked up at the office periods. Following out this system of co-ordinating field and office work, most of the subjects in Forest Mensuration could be covered in a year, omitting some of the more complex to come later under management.

At first the camp is a novelty and a chance for a day's outing, but it later becomes more or less of a field laboratory, depending upon the disposition and seriousness of the student. Here students and teacher can meet on a common level and seek from the woods an answer to woods questions. Outside of the mere information imparted, there is the higher and more lasting value of learning to feel at home in the woods and the securing of a proper attitude toward the profession and the ideals for which it stands.

The department has lost heavily through enlistment, about thirty being overseas or in training on this side, so that the loyalty of our foresters cannot be questioned.

WHAT NEXT?—A "PAPERLESS DAY"?

NO PAPER TO-DAY?

Is that what they say?
 No checks, drafts nor notes—
 No bills, blanks nor votes.
 No letters from folks!
 No need for dictation—
 No bond in the nation.
 No paper Containers,
 No legal Retainers,
 No paper men fawn,
 No waste baskets yawn!
 No parcels wrapped up,
 No "scraps" for the pup!
 No blotters to flout,
 No dolls to clip out,
 No crisp breakfast flakes,
 No Parchment wrapped steaks!
 No wrappers for Bread,
 No books for the Head.
 No files to search through,
 Why, there's nothing to do!

Paper is vitally essential to the moral, mental and physical well-being of any but aboriginal people.

And who wants to be an ab-o-rig-inee?—From the Parchment Prattler of the Kalamazoo Vegetable Parchment Company.

Should Forest Taxes Be Levied on Yield?

Dealing with the problem of forest taxation, which is fast coming to the fore in Canada, Professor Ralph S. Hosmer, head of the Forestry department at Cornell University, suggests as a remedy "that a tax be laid on the yield, once for all, when the stand is finally harvested. During its period of growth the forest pays no tax under this plan but when it comes to be cut, the owner pays to the state a fair percentage on the yield—5, 10, or 15 per cent. as the case may be. But he knows before hand what to expect and furthermore that he will be subjected to the tax only once, and that at the

time when he received his return on the investment. In addition to this tax collected when the timber is cut, this plan includes also a nominal yearly tax on the land itself."

Says Professor Fairchild of Yale University: "The tax on yield has many decided advantages. It avoids the evils of the general property tax. It is equitable and certain. It is in harmony with the peculiarities of the business of forestry and will be a distinct encouragement to the practice of forestry. Its adoption by the states would remove one obstacle to the perpetuation of the nation's forest resources."

Pulpwood Lands Reforest Slowly

Optimistic Attitude of Lumbermen and Pulp Limit Holders is Not Justified.

During the past summer, Dr. C. D. Howe, has been engaged, for the Commission of Conservation, upon an investigation of the reproduction and growth of the pulpwood species, after logging, in the St. Maurice valley, Quebec.

This study was initiated as part of a broad investigation to determine what technical measures are necessary to ensure the perpetuation of the vast pulpwood forests of eastern Canada. This project will necessarily require a number of years for completion, since it will be necessary to place parties in the field in other portions of Quebec as well as in typical districts of Ontario. Possibly similar work may later prove feasible in New Brunswick, although the investigations under way in connection with the present forest survey in that province will furnish at least a very considerable portion of the basic information necessary.

Hardwoods Dominant

Dr. Howe's investigation shows that while the coniferous species comprise about two-thirds of the forest numerically, in the section of the St. Maurice valley investigated, the proportion is practically reversed when we consider the relative space occupied in the crown cover by the conifers and hardwoods. That is, the hardwoods monopolize the light to the extent of about two-thirds while the softwoods fill but one-third of the crown cover. Thus, the hardwoods are biologically dominant, and this dominance is constantly being increased by the fact that practically all of the cutting is of the coniferous species, principally spruce and balsam. Practically no utilization of hardwoods has yet been found feasible on account of the heavy loss due to sinking when the logs are driven down the streams and lakes.

This region was first lumbered lightly for white pine squared timber between 50 and 60 years ago; then more closely for white pine and spruce sawlogs about 30 years ago. Since then, practically the whole area has been cut twice and some of it three times for sawlogs or pulpwood or both.

The object of the investigation was to determine the condition of these cut-over lands with respect to the regeneration and rate of growth of the present pulpwood - producing species, namely spruce and balsam, with a view to estimating the future crop.

A Comment on Cutting

The results of the investigation show that the optimistic attitude of lumbermen and limit holders in regard to the reproducing power of this type of forest is not justified. The good yields of pulpwood material at the end of each of the several cuttings in the past 30 years do not represent the amount of growth accrued during the intervals between cutting periods, but are obtained by cutting successively smaller trees, and in general lower grade material, and also by including a larger proportion of balsam in each cut. For example the spruce stumps were measured and classified according to the age of the cutting on sample plots, totalling 50 acres, and the results are here stated:

Stumps Grow Smaller

In cuttings from 15 to 20 years old the average diameter of the stumps was 15 inches; cuttings 10 to 15 years old, 12 inches; while in cuttings less than 10 years old, the average diameter was 11 inches. This shows a reduction of 4 inches in the average

diameter of the trees taken within the past 15 to 20 years. The actual reduction, however, is doubtless greater, since the measurements record the present diameters of the stumps without making allowance for reduction in size by decay in the past two or three decades.

The tallying of the stumps on the sample plots showed the following increase in the proportion of balsam cut for pulpwood.

On areas lumbered earlier than 15 years ago no balsam was cut. In cuttings from 10 to 15 years old, 65 per cent. and 35 per cent. respectively were spruce and balsam. In cuttings five to 10 years old 45 per cent. of the stumps were spruce and 55 per cent. balsam, while in cuttings less than five years old the proportion is 22 per cent. spruce to 78 per cent. balsam.

Young Trees Present

So far as numbers are concerned, this culled-over forest is well supplied with young growth of potential pulpwood material. The condition of the average acre is represented in the columns below.

SPRUCE

Seedlings, trees up to 1 in. diameter,	635
Saplings, 1 in.-4 in. diameter.....	99
Poles 4 in.-8 in. diameter.....	30
Trees over 8 in. diameter	6

BALSAM

Seedlings, trees up to 1 in. diameter	3,972
Saplings 1 in.-4 in. diamter	161
Poles 4 in.-8 in. diameter	59
Trees over 8 in. diameter.....	6

The casual observer is in danger of being misled if he bases his prediction of an abundant future crop of pulpwood upon the number of young spruce and balsam trees beneath the forest. The amount of future pulpwood material and the time of harvesting the crop, depend as well upon the rate of growth exhibited by the young trees now present.

These statements refer to the time required, under the given conditions, to make a merchantable forest from the seedling stage onward. It will be seen from the foregoing table that there are 30 spruce and 59 balsam

trees from 4 inches to 8 inches in diameter already present on the average acre. They will furnish another crop of pulpwood material in time, but here again the time is long. The growth tables show that it will require about 70 years for the 4-inch trees and about 50 years for the 8-inch trees to reach the 12-inch diameter limit. The larger balsam however, will be merchantable in 10 years or less.

(From report of Committee on Forests, Commission of Conservation.)

CANADIAN AIRPLANE OUTPUT

The factories operated in Eastern Canada by the Imperial Munitions Board for the manufacture of airplanes now has a monthly output of well over a hundred machines, according to word recently received here. The spruce used in making the airplanes is cut in British Columbia, and a market for a considerable quantity of British Columbia Coast spruce, which otherwise might not be used for commercial purposes, has now been found.

THE FORESTRY PROFESSION

Says "American Forestry" concerning "Forestry as a Profession":

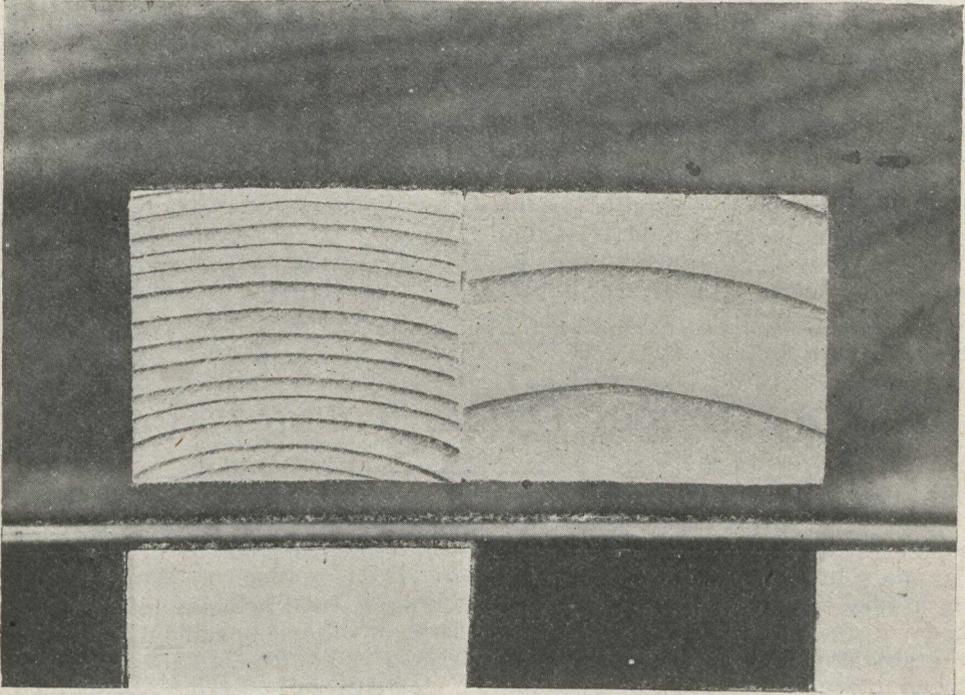
"In Germany a forester cares for about 10,000 acres of forest and usually has two to four assistants. On this scale we would need a body of 50,000 foresters and about 200,000 assistants, besides a large body of specially trained labor, to care for our woods as they should be cared for. To-day not the hundredth part of this number of available men exists in our country.

The American way is not to run after the salesman—the man who has his labor or his goods to offer must hustle and prove his worth.

It is a safe estimate that 10,000 good, capable, honest and industrious men can find employment in the forest work just as fast as they really hustle and prove that they are worth having. And 5,000 more of stronger men can force their way into the forest business and acquire forest property and be their own foresters."

Fast-Growing White Spruce in Quebec

*Demonstrating the Possibility of Producing
Pulpwood in 30 Years.*



(a) Ordinary Growth. (b) Fast Growth.

A piece of ordinary growth white spruce showing almost fourteen annual rings, compared with a piece the same size of rapid growth white spruce from Quebec, showing a little more than two annual rings. Both pieces are magnified two diameters.

A sample of wood recently submitted to the Forest Products Laboratories, Montreal, shows what may be expected of white spruce when it is growing in a favorable position. *The tree from which the sample was taken was 29 years old and was 12 inches in diameter at 18 inches from the ground, which means that the tree averaged to add almost seven-sixteenths of an inch to its diameter every year of its life.* It is interesting to know the effect of such rapid growth on the properties of the wood and the following gives the results of certain determinations together with comparisons with wood of a more usual, slower growth.

The absolutely dry specific gravity is 0.354, which indicates 22.1 pounds per cubic foot. According to recent reports of the U.S. Forest Service,

based on determinations of many samples, the average weight per cubic foot of white spruce, absolutely dry, is about 27 pounds. It appears, therefore, that this rapidly grown specimen is about 20 per cent. less in weight per cubic foot than the average white spruce.

Since spruce is the most valuable wood in Canada for sulphite pulp an examination of the length of fibre was made. This showed that in the last year of growth, i.e., 29 years from the pith, the fibre averages 3.45 millimeters in length, and at 19 years from the pith it averages 2.72 millimeters in length. It may here be stated that the fibre ordinarily is longer in each successive year's growth until about 50 annual rings have been formed. Furthermore, at any given number of years from the

pith the fibre is longest at from 10 to 30 feet from the ground and decreases gradually either higher up or lower down. Now for comparison we have figures from ordinary growth white spruce as follows,—in one tree at 3 feet from the ground and 30 years from pith, average length of fibre 2.25 millimeters; in a second tree at 8 feet from the ground and 20 years from the pith 3.01 millimeters, and at 30 years from the pith 3.65 millimeters. Keeping in mind the fact that the fibre in the rapidly grown specimen was taken at only 18 inches from the ground it appears safe, by comparison with the other figures

quoted, to state that the fibre in this particular tree averages at least 10 per cent. longer than in the ordinary white spruce.

One may conclude from the results stated above that white spruce, planted in favorable ground and protected from suppression by crowding, will yield trees of good size for pulpwood within 30 years, and although the wood will be slightly lighter than that of slower grown trees, the fibre will be of good length.

H. N. LEE.

Wood Technologist,
Forest Products Laboratories of
Canada, Montreal.

Turning Timber Orders Towards Canada

One of the most interesting questions awaiting the close of the war is Canada's future share in the timber market of the British Empire. Already a readjustment is in process whereby it is hoped a larger part of the enormous volume of timber orders given to Russia (60 per cent. of the total requirements) will be turned towards Canada. Readers of the *Forestry Journal* will be glad to know that the Executive Council of the Imperial Institute in London has constituted an Advisory Committee for Canada. This committee consists of Sir George Perley, K.C.M.G., High Commissioner for Canada, chairman; Sir Robert Kindersley, K.B.E., governor Hudson's Bay Company; J. G. Colmer, C.M.G., former secretary, High Commissioner's office in London; J. H. Plummer, Dominion Steel Corporation, and Sir Keith Price, of the Ministry of Munitions.

One of the most important matters on which action is being taken by the committee is that of the more extensive utilization of Canadian timbers in the United Kingdom. The Imperial Institute Advisory Committee on Timbers has been taking evidence on this subject. Arrangements have been made for a series

of practical trials of selected British Columbia timbers to be carried out by H.M. Office of Works, with a view to the inclusion of these timbers in official specifications.

"SUPPRESS THE PATRONAGE EVIL"

Says Industrial Canada, organ of the Canadian Manufacturers' Association, Toronto:

"That live organization, the Canadian Forestry Association is awake to every opportunity to promote its propaganda, the safeguarding of Canada's forest wealth. Industrial Canada is quite willing to second its plea for more careful and impartial selection of the men on whose efficiency so much depends in the way of conserving our great forest resources."

A CORRECTION

In the November issue of the *Journal* an article on the 1917 forest fire losses on the territory of the St. Maurice Forest Protective Association contained the statement that 4367 acres had been burned over "or 61 square miles." Obviously the latter figure ought to have been 6.8 square miles.

:: The Ghost of the Tree ::

BY HOLMAN F. DAY, IN "KIN O' KTAADN"

"I have heard some of you woodsmen talk about the ha'nts and the swogans and the witherlicks and the side-hill loungers—says The Stranger. I know these are jokes, my friends, but do you know when I am up here among these trees that are doomed in these days to the grinders of the great paper mills, I feel a queer obsession.

I feel that each tree has a sort of soul,—a spirit in it, and one potent both for tremendous good and tremendous evil.

Strong as the weight of the avalanche,
Yet weak as brook-breathed vapor,
I must obey—but then I sway—
Behold me—I am paper.

I am ha'nt of the heart of the Tree,
the ghost of the hemlock and spruce,
Phantom of fibre and wraith of the
wood by the axe of the chopper
turned loose.

Cased in the coffining bark long was
I hidden and furled,
But now by the manual magic of men
I carry the news of the world.

I am free—free—free—
I, the soul of the Tree,
Joy and sorrow and terror or smiles—
seek for them all through me.
Fame and name and shame,
To me they are all the same,
I carry them all to the ends of the
earth,
Horror and pleasure and mourning
and mirth,
And to me neither credit nor blame.

I am Paper, I am Paper, pallid spirit
of the spruce,
Summoned far from soughing forests,
patient servant for your use.
They were sent who stormed the
mountains on which, silent and
serene,
Crowding massed the ranks of wood-
land, mighty Army of the Green.
First the woodelves saw with terror
flash and flicker of the axe,
And they watched the steady heaving
of the broad, red-shirted backs;

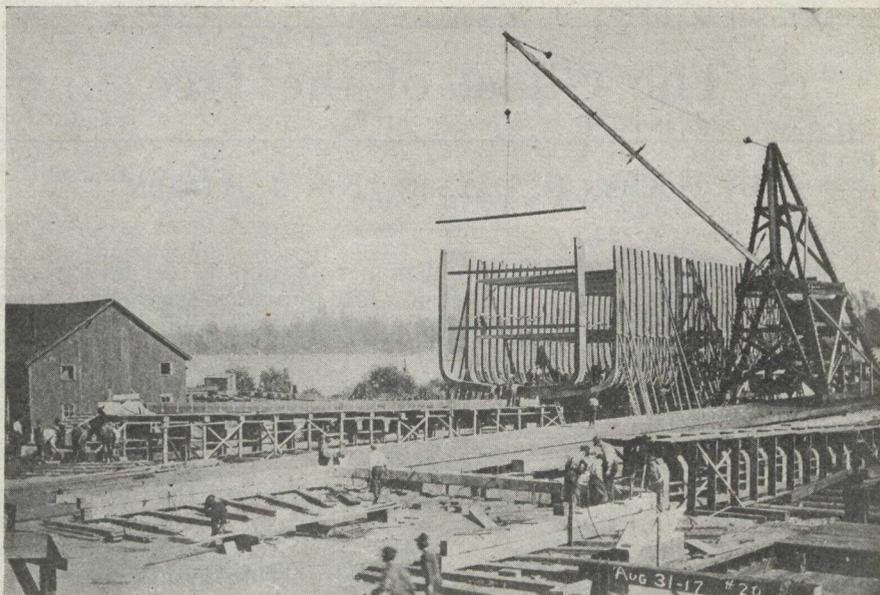
Then they heard the pulsing chopping
as the axes chocked and chcked,
And they felt the forest's tremor as
the toppling giants rocked.

Then as back and ever backward
were the elves constrained to flee,
On the bark they knocked and whis-
pered: "Wake, O Genii of the
Tree"

I am Paper, I am Paper. Have you
praises or abuse
For the message I am bearing? Look
to them, who set me loose;
Look to them who sent me whirling
through the boiling sluices' jaws,
And to them who held the tree trunks
to the yelling teeth of saws.
Yes, to them who tossed the gobbets
of the sodden, dripping wood
To the slavering, grating, grinder,
grunting neath its iron hood.
For they free from solid fibre might
and spirit of the tree
That in race o'er whirring steam-
drums texture book and form in
Me.

If I wrench your soul with anguish
by the message that I bear,
Look to them who dull my whiteness
—those who spread the poison there.

I am Paper, I am Paper, standing
ready for your call,
White and silent and unspotted; I am
serf and slave to all.
Have you thought or inspiration?
Have you word to send or sav
I am waiting, calm and patient, st
your servant and your slave.



Courtesy "Canada Lumberman."
 Shipbuilding in British Columbia.—Placing the frames. Nearby are the keel blocks ready for another ship.

Write! What is it, threat or secret,
 bargain, pledge, or sale, or boast?
 Sign! Ah, mortal, I have bound you!
 Mark you well the forest's ghost!
 Here I stand and threat and mock
 you, shade of promise, debt, or
 fraud,
 Work and pay or pray for mercy!
 You are servant, I am Lord.

I am ha'nt of the heart of the Tree,
 the ghost of the hemlock and spruce,
 Phantom of fibre and wraith of the
 wood by the axe of the chopper set
 loose.

Bearing the news of the world, or
 message of cheer or of hope.

Binding to bondage of debt or of
 shame, or dragging a neck to the
 rope;

I, the soul of the Tree,
 Hover from sea to sea—

Theirs the fault or theirs the praise
 who have helped to set me free.

Fame and name and shame;

To me they are all the same;

They who have dragged me out of
 the wood,

Be I for evil, be I for good,—

To them be the credit or blame.

Grim as the weight of the avalanche,
 Yet weak as brook-breathed vapor,
 I must obey—but then I sway:
 Behold me—I am Paper.

MUNITIONS BOARD OPENS CAMPS

E. L. Kinman, acting for the Imperial Munitions Board, has purchased a holding of the Merrill-Ring Logging Company at Jackson Bay, B.C. The Board had found great difficulty in securing suitable timber sticks for its shipbuilding programme. The lot purchased carries perhaps the most available stand of exceptionally large fir in British Columbia. It will be logged in full length, the location and ground conditions readily permitting this.

To get the contents in board feet of a sixteen foot log, measure the top diameter inside the bark in inches, subtract four, square the remainder and add twenty per cent. for the final result.

Coupling Science to Timber Crops

BY G. C. PICHE

CHIEF FORESTER OF QUEBEC AT INAUGURAL LUNCHEON OF THE WOODLANDS SECTION OF CANADIAN PULP AND PAPER ASSOCIATION, MONTREAL.

Value of Limits Is Not in Area But In Ability to Produce Permanently.

I have always wondered why such a class of men were not taking more care of their forests, why should they bend their efforts only in one direction. It is very sensible to improve your fabrication, but why should you leave your forests, your source of raw material in a bad state; why not apply the same methods of scientific management that you employ successfully in your mill for the production of your timber supply; why leave your forest operations in the hands of your choppers, of your jobbers who have only a precarious interest, instead of employing technical men as you do in your mills. Is this not a lack of foresight, and—if you would be sincere—have not some of you found that the savings made in your mill by your improved methods have been more than wiped out by the increased cost of your wood? Why should the cost of your wood always be on the increasing scale whereas you have succeeded in halting your cost price in your mill, to an almost fixed basis, and then when the cost of labor and supplies follow the same trend on both cases? I know some will object that you are obliged to go further for your logs, that driving is becoming more and more expensive, but why did you not foresee this?

It is becoming a necessity, an imperious want that the paper men will devote some of their energy—to the care and handling of their woodlands. It is obvious that a well defined program should be followed and the work must be systematized if results are desired.

A Permanent Forest

The pulp and paper industry, being established for a long time can afford

to manage its forests on a permanent basis, better than any other class of lumberman. Therefore there should not be any hesitation in considering the question from a broad point of view; and though the expenses may seem high in many cases they will often be an addition to the capital of the company just as when you replace a type of screening machine by a more efficient one. The question of depreciation of timber limits is another subject that should be considered broadly—and I am glad to note that at the last enquiry directed by Mr. Pringle this was agitated with good and telling effect for many who ignored it before.

The Value of Foresters

I suppose that you expect me to draft a sort of a program. I feel the necessity of one, and however imperfect it may be, it will pave the way for discussion, for suggestions, and something may come out of it. Naturally the first effort to be made is to secure the proper man to put in charge of your timber lands; without any question this man should be a forester, a man with technical training, and I hope that my friends of the technical section will not dispute me in this matter. You do not go to any plain man for your chemical work, but employ a chemist; for your engineering work you employ a real engineer; why not employ a good forester for your forest work? Some will object that a practical man is needed. This question of practice has always been brought forth by the men who wanted to save their jobs when a better man appeared on the stage. A forester needs practice as much as the chemist, as the engineer, but he does not re-

quire to have grey hairs, he will not be any good then. He will be afraid of going into the woods, his rheumatism will prevent him from plodding all over the works. A forester if given a chance, if employed for the work for which he has trained himself will certainly do good.

Inventoring Timber

The next move is to make an inventory of your timberlands. How can you work without this data? You keep a strict account of your stocks of sulphur, of coal, of china clay, of colors; why should you not do the same with your forest? The operations to be conducted in an efficient manner must be directed by the head office according to a working plan and not be carried in a haphazard way as done now. The timber should be cut not only on one river, with the chances of jamming, but on different streams and on several grounds so as to equalize the cost price, instead of allowing it to jump every year. The improvements to be made in the way of portage roads, of depots, of river cleaning, of dams, should be known in advance and a fixed budget prepared every year for the carrying of this class of work.

Growth Studies

Studies should be made of the rate of growth of the various species found on your timberlands; so as to know how they should be cut. Investigations of the old lumbered tracts should also be conducted so as to find what have been the results of the lumbering as it was done then. A good deal could be learned this way which would help greatly for drafting plans of lumbering on similar areas. We have begun this work in a few localities, but the province is too large and the interested should have the same studies made for their own benefit.

Are Our Mills 'Limit Poor'?

Reforestation is another subject that will require to be looked after. With the increasing cost of labor and supplies, it will become more and more necessary to have a larger yield of raw material per unit of surface;

instead of culling on an average 2,000 feet per acre; it will be far more economical to cut in 30-40 years from now 5,000 to 10,000 feet per acre. I claim that most of the paper men are limit poor, as a mill producing 100 tons per day would only require a forest area of 200,000 acres, of 500 square miles, if same was managed to produce wood properly. What an enormous capital is carried uselessly by the companies on account of the fact that their holdings are too poor in timber. I calculate that by adding \$1.00 more to the cost price of your wood you could reforest enough land each year to insure you a permanent supply for the future. Naturally the question of time will have to be considered here, but in your plan you can take care of this matter.

How To Use Hardwoods

The utilization of the hardwoods is another subject that should be taken into consideration. It may be necessary to modify the present methods of lumbering in order to assure a more complete utilization of all the trees now found on the timber limits but this problem requires an immediate study, and we should all unite to find the solution.

BURNING WEEDS BY OIL SPRAY

To eliminate growing vegetation from the tracks of the Spokane, Portland, and Seattle Railway during the past summer, an old oil-burning locomotive was equipped with an incinerator and dispatched over the line. The apparatus was designed by the mechanical department of the road and performed efficiently when placed in operation. Fuel oil and steam to atomize it is carried through pipes to a series of six burners mounted a few inches above the rails and just ahead of the leading pony truck. They are arranged in a sheet-iron box that is filled with crushed firebrick and are similar to large blowtorches. To deflect the heat against the roadbed, a large shield, supplied with a water pan, is attached with stay rods to the front of the locomotive and supported close to the track. Back

of the pony trucks there is a sprinkler that is used as a protection for the ties. The engine carries a supply of fuel oil and can cover from 15 to 20 miles a day depending on the

density of the vegetation.

A somewhat similar contrivance has been in use on the Canadian Northern western lines.

Logging Debris—An Imperative Problem

BY ELLWOOD WILSON

FORESTER OF THE LAURENTIDE COMPANY, GRAND MERE, P. Q.

The next step in forestry progress in Canada will probably be toward the better disposal of logging debris. With the advent of co-operative fire protective associations and the consequent great improvement in the forest fire situation and the greater knowledge of the causes of fires and the means for their prevention, it is being realized that could we economically and practically do away with the slash from logging operations, one of the most serious of the remaining causes of forest fires would be eliminated. A fire once started in a logging slash is practically impossible to extinguish until it reaches an unlogged section or some other barrier. The uncut forest, except in exceptionally dry seasons, does not catch fire readily and the fire, if discovered soon enough, is comparatively easy to put out. In looking over a map of the St. Maurice Valley showing the burnt areas, one sees right away that nearly all the fires have followed logging operations, showing that the debris is a great menace.

Top Lopping

Lopping the tops in our spruce and balsam operations has been proved by actual experiment to cost practically as much as brush burning, and it is only a half-way measure. Where the tops are lopped they rot sooner, but for the first year or two are almost as dangerous as unlopped tops, and fires originating in such areas are almost as difficult to extinguish. Burning the debris is perfectly feasible, even with several feet

of snow on the ground, and is very easy in soft wood operations. For two winters, the Forestry Department of the Laurentide Company has been cutting hardwood and all of the debris has been burnt without difficulty. The claim that the additional cost is too great might possibly be true if only one operator burnt his brush, but if such disposal were made compulsory by law, all operators would be on the same footing, and it would be no hardship.

A Misleading Idea

The claim that has often been made that it is cheaper to spend more for fire protection, instead of burning brush, is plausible but fallacious. Even by putting on many more rangers, it is very difficult to keep fires out of slash, and once started, the remaining timber is almost certain to be ruined before the fire is put out. Our dependence for the future is entirely on the uncut forest and the cut-over areas, on which trees below a certain diameter limit and the young growth are left and these must be thoroughly protected. The whole subject is being carefully studied and as fast as the owners of timber lands can be brought to see the necessity of absolute fire protection some practicable law will be formulated.

The first Pennsylvanian to really appreciate the value of forests was William Penn himself. In 1681 he provided that for every five acres cleared in Pennsylvania, one acre should be left in woods.

The Dawn of Science in Lumbering

BY HUGO WINKENWERDER

DEAN OF COLLEGE OF FORESTRY, UNIVERSITY OF WASHINGTON

Logging and lumbering is not the game it used to be. We still call it a game, but if it is it looks a good deal like a hand in poker when the jackpot holds all your resources and the dealer hands you nothing better than a pair of deuces. It was no trick to make money in the lumber business 20 years ago, but during the last 10 years it took a genius. Logging chances are every year becoming more and more difficult, more efficient, though at the same time more complex machinery is necessary, so that logging is becoming a highly specialized and technical engineering problem; mean and discouraging labor problems, that can no longer be solved through the labor agency, but require a thorough knowledge of economics and human nature and the patience of a divinity for a solution, are constantly bobbing up; more efficient methods in manufacturing have become a necessity; transportation problems are now almost constantly in need of attention; and the marketing problem which didn't exist at all 10 years ago, has, in its war with the substitutes, become one of the most important in the industry. These are only a few of the more important general problems in the ever-growing load the industry has to carry on its shoulders. There is a limit to human capacity, and if these problems are ever to be solved it will have to be done by experts, who have the technical foundation and the time to work them out thoroughly.

The Forest School Can Help

You know as well as I do that in looking after the daily routine of your business, both you and your present administrative organization of managers, superintendents and foremen don't have the time to make extended studies on the problems

that are in need of investigation, and that it would be done better and much more thoroughly if you had some one with the proper technical training who, working under your general supervision, could give all, or nearly all, of his time to this work. Every other really big industry is doing it. You've got to come to it. Your industry is shouting from the housetops right now for just that kind of thing. Why not make a start immediately? You know that you have a hundred and one problems that you would like to work out, any or all of which may mean greater efficiency resulting in smaller operating costs.

Technical Questions

That you will look to the forest schools to supply you with men of sufficient technical training so that you can gradually work them into positions where they will be a help in the solution of these problems is evident from the demands that have been made on the technical schools of other industries and are now being made on the forest schools by the lumber industry. Our work as an information bureau concerning technical questions that arise in the industry has been growing tremendously, and it is a barometer that shows your technical difficulties.

One of the most expensive woods used in America is boxwood. It sells for about \$1,500 per thousand board feet.

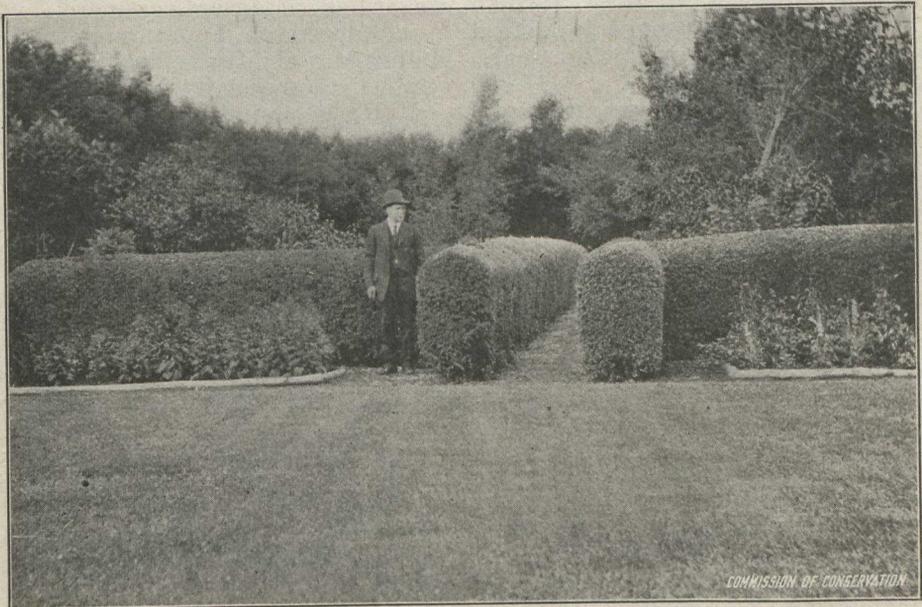
News has reached Ottawa that the son of Mr. E. W. Beckett, Crown Timber Agent at New Westminster, B.C. has been killed in action.

How Fast Does a Forest Rebuild Itself?

The rate of growth of trees in the forest is usually exaggerated greatly.

Dr. C. D. Howe, who during the past summer made a study of the reproduction and growth of the pulpwood species after logging, in the St. Maurice Valley, Quebec, on behalf of the Commission of Conservation, produced the following conclusions:

Over 2,000 trees were analyzed to determine their rate of growth in diameter, height and volume. While the results of this study have not yet been tabulated, they have gone far enough to justify the statement that within the forest type under consideration, it takes about 40 years for the little spruce trees to acquire a diameter of one inch; 100 years to make a six-inch tree, and 150 years to reach the minimum diameter limit of 12 inches established by the cutting regulations in Quebec, for white and black spruce. Balsam grows somewhat faster. A one-inch tree is made in about 16 years, and it takes in the neighborhood of 70 years to reach the Quebec diameter limit of seven inches at two feet from the ground.



PRAIRIE GARDENS, INDIAN HEAD, SASK.

By the provision of trees and shrubs and the encouragement of improved environment round the farms, a means is found to make farm life more attractive.

Twenty-two Times as Much B. C. Timber Burned as Has Been Put to Use

An astounding proof of heavy forest fire losses in the Province of British Columbia is made public by the Commission of Conservation which has been conducting an investigation of the forest resources of the province during the past four years.

This investigation has shown that on 95,000 square miles—nine times the size of Belgium—the timber has been uselessly destroyed by fire, mostly many years ago.

The amount of timber so destroyed is estimated to be not less than 650,000,000,000 feet, or about twenty-two times as much as the total that has ever been cut by the lumbermen in that province. Putting the loss in another way, this timber is equivalent to almost twice the amount of saw timber now standing in the province, and to nearly as much saw timber as is now standing in the forests of all Canada.

Much of the area burned over contains young forest growth, which, if protected from further destruction, will, in time, furnish the basis for enormous industrial development on our Pacific Coast. If we assume that the 97,000 square miles of cut-over and burned-over lands should be made to produce an average of only 100 board feet per acre per annum, the total increment would amount to 6,200,000,000 feet per year, or about five times the present annual cut. That this estimate is by no means beyond the bounds of rea-

son is shown by measurements of growth which have actually been made.

The Government and private operators of British Columbia have realized fully the gravity of past losses by forest fires, although probably few were prepared to admit that the situation was as grave as the conclusions of the Commission of Conservation actually show. Happily the provincial forest service is making sure that the annual losses are kept as close to a minimum as the present staff and expenditures allow. This year, for example, the total losses to merchantable timber from forest fires was estimated at \$178,401, which is a vast decrease from some of the summers prior to five years ago. At the same time it must be borne in mind that a good many of this year's fires were on areas previously burned over and, therefore, the timber crop was not there to be destroyed.

The total estimated stand of timber in British Columbia to-day—regardless of present commercial value—is placed at approximately three hundred and fifty billion feet.

The commercially valuable timbered area of about eleven million acres is estimated to bear a stand of two hundred billion feet.

The "Lumber World Review" in issuing "The British Columbia Timber Primer" makes an estimate that five per cent. of the total area of the province bears timber having a present commercial value.

French Forestry and Canadian Timber Growth

Lt.-Col. J. B. White, woods manager of the Riordan Pulp and Paper Company, Montreal, and for the past two years in charge of forestry work in England and France, stated recently that if yields of 30,000 to 45,000 board feet per acre were frequent in France, as his own investigations had shown, there seemed no reason why Canadians should tolerate

the relatively small productivity of timberlands in Eastern Canada where soil and climatic conditions were not dissimilar to those of France. One plot, measured by Col. White, contained 100,000 board feet within an acre. Such a showing did not tend to increase our satisfaction with Canadian lands producing only two to three thousand board feet per acre.

A Prophecy on Forest Denudation

The Journal reproduces the following letter from the Montreal "Gazette" because its authorship commands attention. Mr. William Little of Westmount, P.Q. was to a great degree the founder of the Canadian Forestry Association and has upheld its work with splendid zeal, even now when the weight of advanced years makes itself felt. As a leading lumberman and the son of a lumberman, Mr. Little has evinced a foresight no less noteworthy than his public spirit. Many lumbermen to-day recount Mr. Little's early prophecies of Canadian forest conditions which, while gloomy enough then, have since proved abundantly true. To the Editor of the Montreal Gazette:

Sir,—If you will refer to the columns of the Gazette of a quarter of a century ago, you will find therein editorials by the Gazette and letters of mine by the score, protesting against the sacrifice of our timber resources in the most reckless manner by our government for the merest trifle of their value, beseeching them to take stock of our white pine and spruce timber before it was too late, only to be ridiculed as visionary alarm ists.

The End of White Pine

Now, at last, when our stock of white pine timber is reduced to the mere cullings discarded by previous operations, while in most of our log booms are found about nine spruce logs to every one of pine, and but few of these are over ten inches at the top end, we find that our spruce timber, except that in British Columbia, is in about as deplorable a condition as our white pine, for we are informed by Mr. James White, of the Commission of Conservation, that instead of having, as supposed, material for a supply for fifty years, as reported by cruisers in Eastern Canada and the United States, that about thirteen or fourteen years' supply on this side of the Rocky Mountains would be nearer the limit. And this

is the stock we are now to depend on, not only for our home requirements, but to supply the Empire and her Allies that have been robbed of their timber by the German armies that devastated everything wherever traversed by them.

Spruce Prices Jump

This scarcity of spruce timber is now becoming evident not only here, but in the New England States, as is shown in the markets of Boston and New York, where spruce timbers that were sold three years ago at from \$18 to \$20 per thousand feet, are now selling for \$40 a thousand feet, board measure, and the smaller spruce timber that was of hardly any value, a few years ago, is now, on account of its great demand for pulp and paper making, considered of almost as much value as common pine, so that the Canadian pulp mills that sold their output of woodpulp at \$16.50 per ton in 1914 are selling it now at \$42 per ton.

And the spruce wood itself that was sold, f.o.b., cars here only two years ago for from \$5 to \$6 per cord for unpeeled pulpwood, has lately been sold at \$15 per cord, for rossed wood on the cars. And a press item states that the pulpwood timber is now getting so scarce in the Adirondack woods that the pulp mills at Watertown, N.Y. State, are paying from \$18 to \$21 per cord for rossed wood delivered to their mills.

Effects of The War

And a glance into the future would indicate that even these prices must be greatly increased when account is taken of the frightful devastation of timber that has already been made in the forests of Europe, notably in Belgium, France, Poland, Eastern Russia, Western Prussia, Austria-Hungary, Italy, Turkey, Greece, Serbia, Bulgaria, Roumania and even in Great Britain and Ireland; and it is known that in all these countries the stumpage value of spruce and fir timber even years before the war far exceeded any price paid for like

stumpage in either the United States or Canada, in many instances fully ten times the amount paid here. One cannot fail to realize that such property must rapidly advance in value when hostilities cease, which cannot very long be deferred.

How Europe's Forests Pay

I have a descriptive illustration of a spruce forest in Saxony which shows that the smaller spruce trees there were valued at \$15 per cord stumpage, in the woods for pulpwood, and the larger trees were valued at from \$25 to \$35 per thousand feet, board measure, for lumber. And an illustration of a forest of fir timber in the Vosges, France, planted 100 years ago, that

was valued at \$1,500 an acre or fully \$40 per thousand feet stumpage. And another spruce forest near Oberindorf in the Black Forest, Germany, was valued at \$2,500 per acre, which is equal to \$50 per thousand feet for the wood crop alone.

Such prices as these for similar timber should admonish us against foolishly sacrificing our spruce timber for one-tenth of its stumpage value as we did our white pine, and as we are now doing with our spruce, or we will soon have only the stumps left, as is the case with our pine, to remind us of our great imprudence.

—WILLIAM LITTLE

November 3, 1917.

Slash Disposal Experiments in Canada

Specific experiments in slash disposal on the Western Forest Reserves have been so successful that the Dominion Forestry Branch has decided to continue this work and, by means of investigations on larger areas and areas of varied conditions in timber, soil, etc., to develop a policy which will render Canadian forests as free from fire danger, due to the leaving of slash, as European forests are generally considered to be.

The experiments were first conducted under the easiest conditions, namely, in jack-pine timber, on small tracts, in somewhat open and even-aged stands without heavy brush, and on sandy land where the fire could not run easily. The brush was piled while the operation went on and burned later. Spruce forest was chosen for the next experiment, and here also results were satisfactory, even though the litter customary on the forest floor of such forests would seem to offer a dangerous possibility for fire getting beyond control in the burning process. At the outset, caution dictated that the piling of the brush be done by the operators and the burning by the forest rangers. Subsequently, however, both piling

and burning were given into the hands of the operators, and it was found that burning immediately after the trees had been cut gave the most satisfaction and proved the safest method.

The cost of this slash disposal varied from 25 to 75 cents per thousand feet board measure, according to the efficiency of the operators after some experience, their spirit of willingness or unwillingness to adopt this new method appearing greatly to influence their efficiency; that is to say, the higher cost was maintained for work done by operators who contended that the experiment would not work, while the lower cost was the result where workers started in with the idea that the work would be done well and quickly.

Not the least of the benefits derived from these experiments is the admission by a majority of the operators that this is the proper method of handling slash to insure protection against fire, some also adding that having the brush out of the way facilitates further operations to such an extent that they regard the cost of its removal as practically nil.—

Journal of Forestry.

How Many Logs are Lost by Sinking?

One of the penetrating questions asked of the paper manufacturers of Canada in the course of the Government "probe" into news print paper prices recently has had to do with the percentage of loss due to sinking of logs between the timber limit and the boom. This loss, if determinable, affects the costs of operations and must be included in any thorough-going compilation of production figures.

An interesting reference occurs in the well-known text book, "Logging" by Prof. Ralph Bryant, of Yale Forest School, as follows:

From 10 to 30 per cent.

"A very appreciable loss in driving timber is due to sunken and stranded logs. The extent of this loss is dependent on the species driven and the character of the stream.

"Where timber is brought down rough streams, over waterfalls, and past obstructions it is often badly battered and broken, and gravel and sand become imbedded in a large per cent. of the logs. Occasionally they accumulate iron and spikes, especially where iron dogs are used in rafting. Much of this foreign matter is not readily detected, and mills suffer a monetary loss due to

damaged saws and time lost by the saw-mill crew.

"The actual loss in log scale from all causes on the Mississippi River drives averages about 10 per cent.; on the Cumberland and Tennessee Rivers in Kentucky, 10 per cent.; in Montana, 10 per cent.; spruce, 5 to 10 per cent. and birch, 3 to 27 per cent. on short drives in the Northeast; hardwoods in Pennsylvania, 25 to 40 per cent.; yellow pine, 20 to 33 per cent. The loss in the Lake States may be as high as 30 per cent. On short drives of coniferous timber the loss is small and may be from zero to 3 per cent. This loss is due largely to sunken and stranded logs and not to the deterioration of sapwood."

Evidence In Legal Suit

In the case of James L. Gates, Elliott C. Young, Lumber Inspector of District No. 2, Wisconsin, tried in the courts of LaCrosse, Wisconsin, in 1901, an attempt was made by plaintiff to compel defendant to reimburse him for difference in scale between the "bank" and the boom. During the trial prominent lumbermen from the Black River district testified that "there might and would occur a difference between the woods and mouth scale of from 10 to 30 per cent.

Winning the Children for Forest Conservation

The scheme of travelling lecture sets, used by the Canadian Forestry Association for the carrying on of its propaganda in many parts of Canada has been developed this winter much beyond the proportions of last year.

Three outfits are now employed, moving from town to town, and bringing the gospel of forest conservation to thousands of adults and children who could not otherwise be reached without heavy expense and an increase of staff.

What the "Outfits" Are

These outfits supply from fifty to sixty lantern slides mostly colored, and a readable manuscript, bound in cloth board covers. They are used chiefly by school boards and churches, most of which possess stereopticon equipment. A lecturer is chosen from among the school teachers or local clergymen, whose duty it is to read the introductory story and accompany each lantern slide, as projected upon the screen, with a paragraph of descriptive matter, all

of which is contained in the manuscript supplied free by the Forestry Association.

Booking the Lectures

The method of booking these town-to-town lectures may interest members of the Association. An arrangement is first made with the Boards of Education in about twenty towns and cities to use one of the lecture sets. The outfits are so prepared as to carry themselves automatically from place to place. Each is packed in a stout wooden case, in which the individual slides rest in the centre of inch-thick layers of soft felt making breakage almost impossible.

In the inside top of the lid is pasted a route list of the towns and the dates when each must receive the box. A packet of ready-addressed gummed labels is also attached to the inside of the cover. Each recipient is notified by letter a few days before the box is to reach him. He, in turn, is

relieved of any trouble in sending the outfit to the next address for he tears off one of the addressed labels, sticks it on the outside of the box and hands the latter to the express agent at the conclusion of the engagement in his community. Each recipient pays the small expressage fee.

Remarkably good results have been secured from the circulation of these lectures. Going direct from town to town, much valuable time is saved and not a little expense. School principals and clergymen and leaders of Boy Scouts have taken up the idea with enthusiasm so that the demand at present is in advance of the three lecture sets.

It will be seen readily that thousands of Canadians are being reached in this way, and have been given an introduction to the subject of forest conservation. The public illustrated lecture cannot be surpassed as a means of implanting ideas and creating a body of permanent opinion.

A few examples of how the Canadian Forestry Association's travelling lecture sets are being used and enjoyed are given herewith:—

At London, Ontario, the Board of Education used one of the outfits as the basis of five evening meetings, held in the schools of the city. The report of the Secretary-Treasurer speaks of the lively interest shown by the senior scholars and their parents and of the entertaining and instructive character of the lecture material. Five meetings in one city from one lecture outfit is indeed a full measure of co-operation.

At Bathurst, New Brunswick, the local moving picture theatre was used to assemble the students of the schools where a Canadian Forestry Association lecture was greatly enjoyed.

At Chatham, N. B. another outfit was utilized before a large audience of children in the assembly hall of Aberdeen School and reports speak of the close attention of all present.

At Brantford, Ontario, Inspector Kilmer reports that "the lecture and views were both very much enjoyed and appreciated by the students and good results will ensue."

It is estimated that with the three travelling lecture sets at work, the Forestry Association by this means alone is speaking to a minimum of 2000 to 2500 young people every week.

National Existence and Forest Maintenance!

BY DR. BERNARD E. FERNOW

“When the questions of the extension of suffrage to women, of tariff, of taxation, of coinage and currency, which are all merely incidents, will have sunk into the background, the question of the economy of the resources which constitute and sustain the political, commercial, and social power of the nation—long neglected—will still claim attention; for only those nations who develop their natural resources economically, and avoid the waste of that which they produce, can maintain their power or even secure the continuance of their separate existence. A nation may cease to exist as well by the decay of its resources as by the extinction of its patriotic spirit. While we are debating over the best methods of disposing of our wealth, we gradually lose our very capital without even realizing the fact..... Whether fertile lands are turned into deserts, forests into waste places, brooks into torrents, rivers changed from means of power and intercourse into means of destruction and desolation—these are questions which concern the material existence itself of society; and since such changes become often irreversible, the damage irremediable, and at the same time the extent of available resources becomes smaller in proportion to population, their consideration is finally much more important than those other questions of the day.”

White Pine Immune in N. B.

An interesting meeting was held on the 3rd of December at Fredericton, N.B. when the field staff of the New Brunswick Government Forest Service was addressed by Prof. R. B. Miller, Dean of the School of Forestry, and G. C. Cunningham, in charge of the Dominion Government Plant Pathological laboratory on the White Pine Blister Rust, and by J. H. Tothill, in charge of the Dominion Government Entomological laboratory on the Spruce Bud Moth. Among those present were Col. T. G. Loggie, Deputy Minister of Lands and Mines, A. T. Murchie, Superintendent of Scalpers for New Brunswick, and W. E. McMullen of the

Crown Land Department. The opinion expressed by those present was that no White Pine Blister Rust has yet been discovered in New Brunswick. Arrangements were made whereby the Forest Service will do scouting this winter under the direction of Mr. Cunningham.

In regard to the Spruce Bud Moth, Mr. Tothill states that as a result of his studies of representative areas for the past five years in New Brunswick, he is of the opinion that the present outbreak is now on the decline. The staff of the Forest Service will also collect data in this regard this winter.

A New Medium Between Foresters and Woods Managers

Recently at Montreal was launched a "Woodlands Section" of the Canadian Pulp and Paper Association. As expressed in the by-laws the objects shall be "to stimulate interest in more economical and efficient methods of production and utilization of raw materials for pulp, paper and lumber industries; and to provide means for the interchange of ideas amongst its members and to encourage investigation of woodlands problems."

This heralds a movement having the highest import for the wood-using industries of Canada. For altogether too long, the technical forester has been an appendage rather than an integral of Canada's lumber and paper making enterprises. In almost every other department of a paper manufactory than the management of the forests, the technical expert has been accepted as a basic necessity. Now arises a medium, identified with the business control of the industry, whereby the Forester may at last be allowed to place his special knowledge at a company's disposal. This will be achieved very

happily by the creation of a sort of common council table at which the problems of the woods departments should come nearer solution.

As knowledge of actual woods conditions ceases to be guess work and becomes scientifically-proved, those responsible for the affairs of great wood-using corporations are coming more and more to realize that the forest management of the past cannot hold the log supply abreast of the mill's necessities, cannot 'make good' the common boast that the timber crops are repeating themselves every thirty or forty years. The more data produced on a forest region, the clearer becomes the conclusion that Eastern Canada's forests are rapidly deteriorating. If this is permitted to continue, the same deterioration will eventually sweep the mill investments to ruin. It is high time, therefore, that the science of woods management was given more scope in actual cutting and logging practice, not by brushing present men and methods to one side but by giving effect to the most reasonable and valuable elements of each.

Guarding 21 Million Acres

Wherever modern forest protection gets a working chance, it demonstrates its ability to save public and private timber owners an enormous amount of money. The past season was a tricky fire year in the Pacific Northwestern States, producing no fewer than 7,688 fires, of which 938 are given as 'bad' fires.

On regular patrol on the 21,000,000 acres were 2,579 regular rangers and 12,000 extra men were called in to fight fire at various times. The total

expended for fire protection was \$1,825,000. On the lands of the Western Forestry and Conservation Association, 650 patrolmen extinguished 2388 fires. The loss of timber was very much under previous severe years.

One of the special causes of trouble, is said to have been the activities of the I.W.W. and other pro-German workers, intent upon destroying some of the areas particularly of aeroplane spruce.

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

British Columbia's Search for Markets

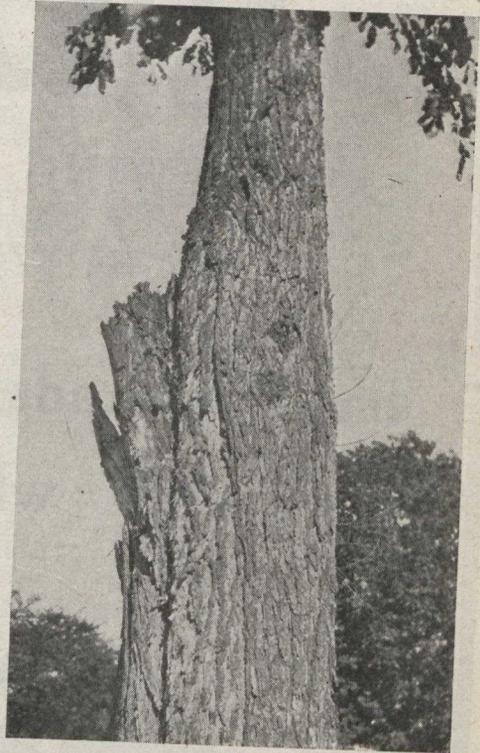
With the wealth of forest products this province has to offer to the markets of the world, combined with its geographical location in relation to such markets as South America, Australia, South Africa, India and China, British Columbia should do a large export trade. Some of these markets will take the lower grades which are always produced when high grades are sawn. British Columbia has a large and important market in Canada, but wider markets absorbing all grades will give that stabilizing influence so necessary in the lumber industry to-day. A restricted market dependent on the success or otherwise of a grain crop in one particular part of the world is too uncertain a foundation for a business in so widely applied a staple product as lumber. Therefore, we hope to broaden our business and sell our products in a greater number of markets. We need variety in our markets to absorb all the product of the log. This will enable us to produce more economically with a greater benefit to the consumer.

As a result of a better log market in British Columbia the export of logs in 1916 amounted to but one-half the quantity exported in 1915.

Pulp and Paper

In pulp and paper production in British Columbia marked activity has been evident during the whole year. All plants in operation have run continuously, producing a total of 80,000 tons of paper and sulphite wood pulp. Three new companies have commenced operations this year, two of which are already producing, and the third will be doing so in the very near future. Our production of pulp and paper in 1917 will probably be double that of 1916.

In addition to pulp and paper developments on the coast large areas



Tree 'doctoring' needed on Ottawa's beautiful driveway. A broken stump of a limb has allowed fungus diseases to penetrate the trunk. For lack of attention thousands of fine trees are lost each year by our Canadian municipalities.

of pulp timber are available in the interior, development of which will undoubtedly be undertaken before long. Many enquiries regarding these are now being received from concerns who are beginning to realize that the last great reserves of pulp timber of the continent are in this province.

To sum up, the experiences of 1917 have shown that notwithstanding great difficulties such as shortage in labor and supplies and the confused railroad situation regarding cars, the Pacific Coast province of Canada is struggling successfully to overcome the handicap of war conditions.—
(Canada Lumberman).

Forest Reserves in Burma

(Dealing with the question of laying down and putting through a strong policy for future reservation with the object of taking in all areas capable of procuring marketable timber that are unsuitable for permanent cultivation and checking the inroads of the taungya-cutter).

A glance at the map of most forest divisions in Burma shows a number of forest reserves of various sizes, and that these reserves are for the most part more or less remote from the more populous parts.

The chief reason for the former appears to have lain in the suspicious attitude of the authorities to reservation, and, for the latter, to the boundaries being thrown back in deference to the wishes of the villagers.

Moreover, owing to the value of teak overshadowing that of all other species, it is only in recent years that reservation in the interests of the latter has received serious consideration.

In throwing back the boundaries of the reserves in deference to the wishes of the villagers, we certainly have not considered the best interests of the community.

In accessible areas the throwing back of the boundary has resulted, so far as the excluded area was concerned, in the removal of all marketable timber by the trader and the serious depletion of the immature stock by the wasteful use of the villager. Superimpose a trade demand for firewood and areas that were at

one time capable of producing marketable timber are in a couple of decades reduced to wastes that are only reclaimable at an enormous outlay.

What the result of excluding forests in deference to the wishes of the villagers has been is emphasized by the fact that it is now necessary to seriously consider the question of forming village forests, that is, within a generation the villagers and traders have squandered the resources of the accessible areas.

Reserving by Patches.

The Forest Officer in the past was to a great extent compelled to take too narrow a view, but this view is broadening and the same process of evolution has lessened the suspicions with which the civilian authorities formerly regarded our operations. In the past we were compelled to reserve in patches and to exclude much of the accessible areas.

Should we continue in the future to allow without protest what remains of the unclassed forests to be turned into irreclaimable waste we shall justly lay ourselves open to the reproach of future generations.

As a result of our past policy the less accessible areas are reserved to a great extent and the more accessible steadily deteriorating, though burdened with troublesome regulations, made in a vain effort to stay their ruin and impossible to enforce efficiently.

The only remedy for this state of affairs appears to lie in the reservation

BOVRIL Saves Kitchen Waste

There will be no more throwing away of good food if you keep a bottle of Bovril in the kitchen. Bovril helps you to make delicious dishes out of cold food. Better soup, better stews—less expense.

of all tracts capable of producing timber or fuel.

In carrying out this reservation all lands suitable for permanent cultivation should be excluded and definite areas should be set aside for such communities as must exist by taungya cultivation.

Communal Forests.

The settlement might be by townships or any other suitable units and should be carried out on broad-minded lines. To begin with unnecessary bogies, such as that relating to the use of fire in areas unlikely to be brought under fire-protection, should be eliminated from the proclamation. We should also revise our ideas on the subject of what constitute trespass by man and beast and modify the ruling, limiting the exercise of rights to the number of houses actually inhabiting a village at the time of settlement.

The area, within a reasonable radius of habitations, should be reserved for management mainly as communal forests, the original inhabitants getting their produce free, and provision being made for immigrants, being as far as possible provided for at privilege rates. The profit on the management of such communal forests should be utilized for the benefit of the villages in their vicinity.

It should not be considered trespass by man or beast to stray within a reasonable distance of a right of way. Above all the necessity for dealing with unimportant technical offences in a broad-minded way should be impressed on Divisional Forest Officers.—(*Official Bulletin*)

WILSON AVE., ST. THOMAS.

Described by Mr. Thomas Adams, Town Planning Expert of the Commission of Conservation as "an inexpensive and attractive street suitable for suburban and semi-rural districts which are served by single-track street railways. The flower beds at the intersections are planted and maintained by the Horticultural Society. (See cut on page 1427.)

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.

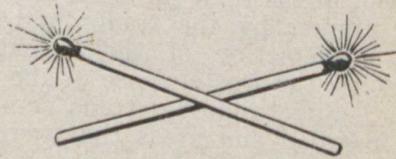
For thirty-nine years McIntosh lanterns have been demanded by the most discriminating users of the United States and Canada.

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



MARBLE'S

Dry Matches

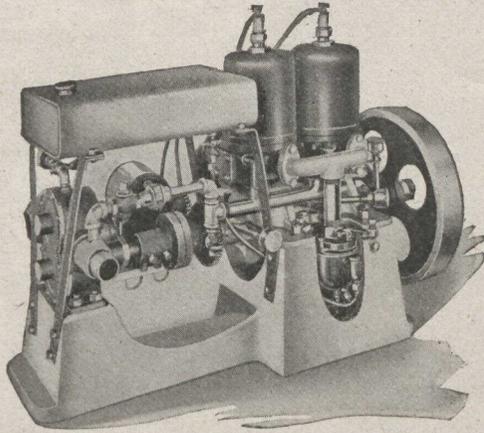
After all day in a boat, rainstorm or wet snow. Ask your dealer for

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.

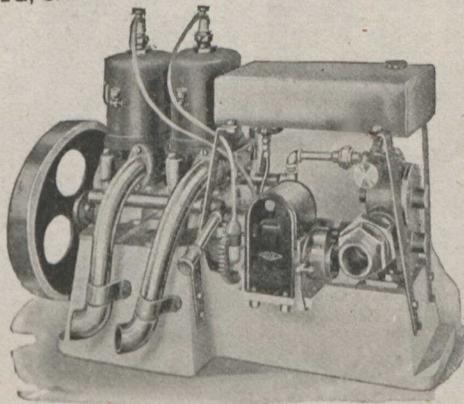
They can be readily transported wherever man or pack horse can go.

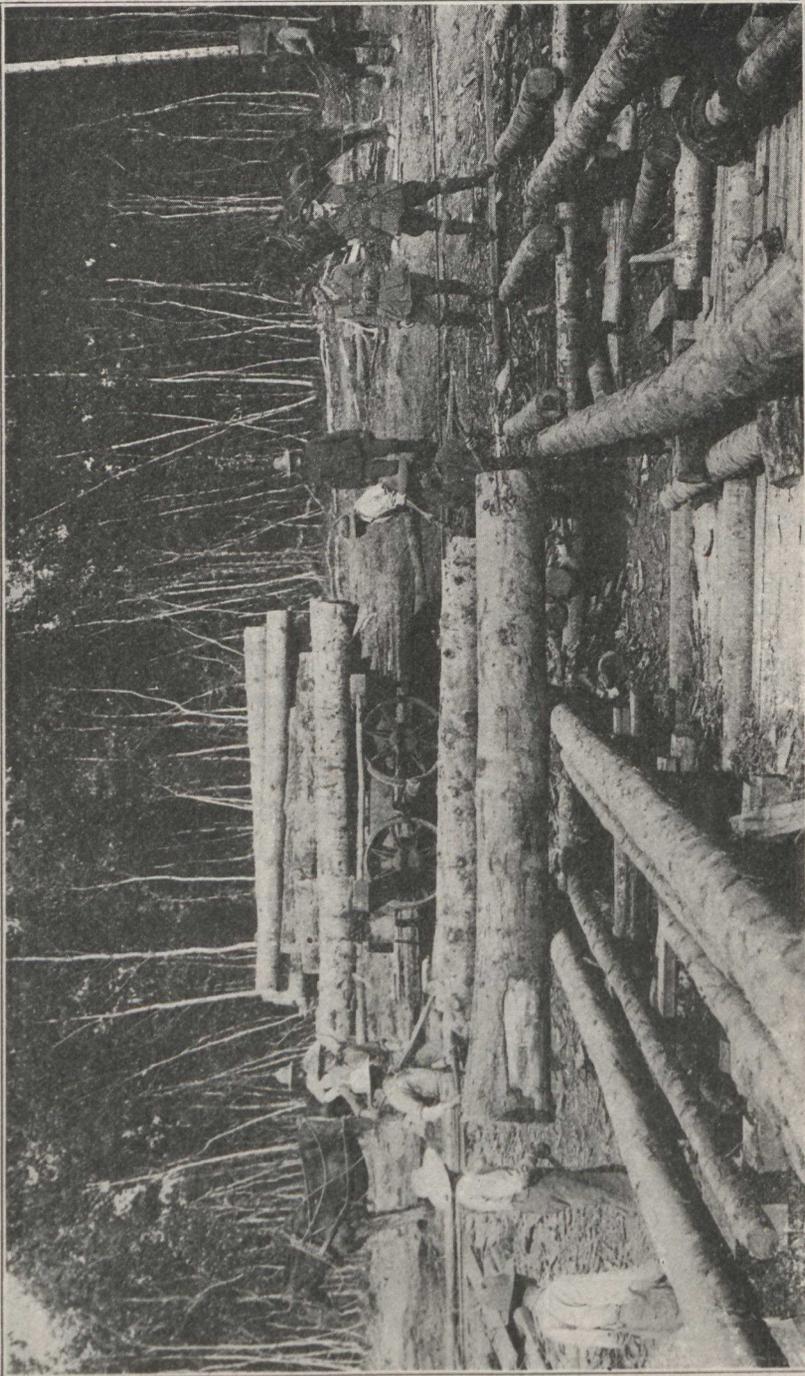
Governments and Private Owners of Forests everywhere, can materially reduce their fire losses by the use of these outfits.

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.





(Courtesy of American Forestry)

LUMBERING OPERATIONS WITH THE BRITISH ARMY

In this picture is shown some of the work of the Canadian Forest section on the western front. The men are engaged in bringing in the timber from the forests, ready for sawmill operations. The character of the logs shows the care exercised by the foresters in making selections, while the trees in the background show possibilities for the future of French forestry.

RENNIES SEEDS

PUREST-CLEANEST
MOST RELIABLE
GET CATALOGUE

AT BEST DEALERS
OR DIRECT
TORONTO - MONTREAL
WINNIPEG - VANCOUVER.



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.

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 Reforestation. 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.

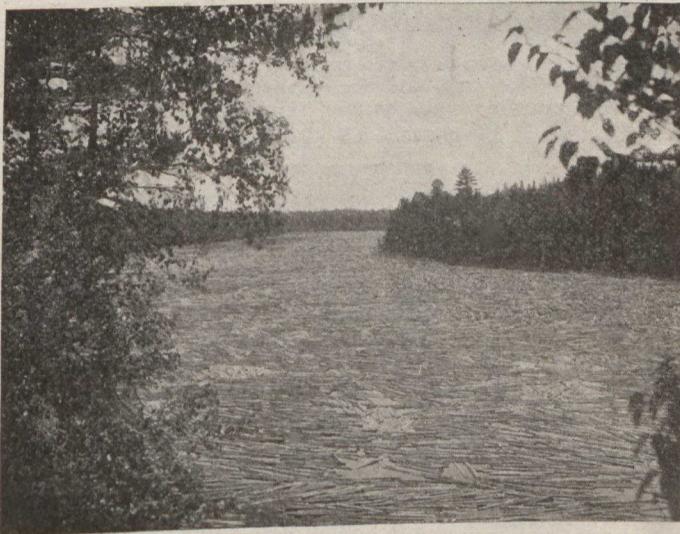
CONSULTING ENGINEER.

Water Powers. Timber Lands.
Forest Industries.

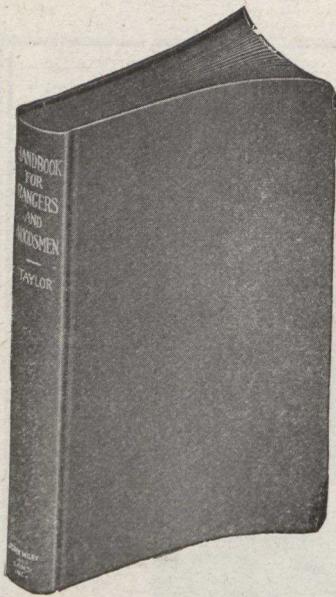
164 St. James St. **MONTREAL.**



On One of the Beautiful Elm-lined Streets of Fredericton, N. B.



30,000,000 Feet of Logs from a New Brunswick Timber Limit.



Every Forester and Lumberman
Should Have This Book

HANDBOOK FOR RANGERS AND WOODSMEN

By JAY L. B. TAYLOR
Forest Ranger, United States Forest Service.

This Handbook will be a helpful guide to all engaged in woods work, and those whose recreation takes them into rough and unsettled regions. It has been prepared as a result of the author's experience in field work of the United States Forest Service.

A feature of this book is its convenient size and the flexibility of its binding.
429 pages, $4\frac{1}{4} \times 6\frac{3}{4}$, 236 figures. Flexible binding, \$2.50 net.

THE ESSENTIALS OF AMERICAN TIMBER LAW

By J. P. KINNEY, A.B., LL.B., M.F.

This volume has been prepared to meet the needs of those engaged in the study or practice of forestry, and the requirements of lumbermen and others interested directly in the production and sale of timber products.

308 pages, 6 x 9. Cloth, \$3.00 net.

2ND EDITION, THOROUGHLY REVISED

THE THEORY AND PRACTICE OF WORKING PLANS

(Forest Organization)

By A. B. RECKNAGEL, B.A., M.F.,
Professor of Forestry, Cornell University.

In this edition the author has brought the book into accord with the best usage of today. Many important changes have been made which increases its usefulness to the forester.

279 pages, 6 x 9. illustrated. Cloth, \$2.00 net.

Canadian Forestry Journal

119 Booth Building, OTTAWA

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

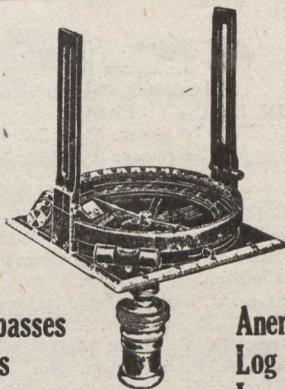
Technical training and ten years
experience, in part with U. S. Forest
Service.

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.

The Canadian Forestry Association

(Eighteenth Year)

119 BOOTH BUILDING, OTTAWA, CAN.

Patron, HIS EXCELLENCY THE GOVERNOR-GENERAL.
 Honorary President, RT. HON. SIR ROBERT L. BORDEN.
 Honorary Past President, RT. HON. SIR WILFRID LAURIER.
 President, HON. SYDNEY FISHER. Vice-President, GORDON C. EDWARDS
 Treasurer, MISS M. ROBINSON, } Booth Building,
 Secretary, ROBSON BLACK, } Ottawa, Can.

Directors.

Lt.-Col. J. B. Miller, F. C. Whitman, William Little, Hiram Robinson, E. Stewart, W. B. Snowball, Thomas Southworth, Hon. W. C. Edwards, Geo. Y. Chown, Hon. W. A. Charlton, Wm. Power, M.P.P., Hon. W. J. Roche, Sir Geo. H. Perley, Alex. MacLaren, R. H. Campbell, Dr. B. E. Fernow, Ellwood Wilson, Senator Bostock, G. C. Piche, Alex. MacLaurin, Mgr. P. E. Roy, A. P. Stevenson, Wm. Pearce, C. E. E. Ussher, Denis Murphy, C. Jackson Booth, Sir Wm. Price, J. W. Harkom, A. S. Goodeve, W. C. J. Hall, J. S. Dennis, J. B. White, E. J. Zavitz, Geo. Chahoon, Jr., R. D. Prettie, Hon. N. Curry, A. C. Flumerfelt, H. R. MacMillan, Clyde Leavitt, Albert Grigg, J. T. Horne.

Territorial Vice-Presidents.

Ontario:—Hon. G. Howard Ferguson.
 Quebec:—Hon. Jules Allard.
 New Brunswick:—Hon. George J. Clarke
 Nova Scotia:—Hon. O. T. Daniels.
 Manitoba:—Hon. T. C. Norris.
 Prince Edward Island:—Hon. J. A. Matheson.
 Saskatchewan:—Hon. W. M. Martin.
 Alberta:—Hon. A. L. Sifton.
 British Columbia:—Hon. T. D. Pattullo.
 Yukon:—Hon. Geo. Black, Commissioner.
 Ungava:—His Grace Mgr. Bruchesi, Archbishop of Montreal.

The Association prepares and places through its Publicity Department, many hundreds of special articles every year, reaching the Canadian Public through daily and weekly newspapers, weekly and monthly magazines, including agricultural, financial, religious, literary, engineering, juvenile, and practically all divisions of Canadian journalism.

Co-operates actively with forest protective associations, Government forest departments and commercial organizations in distributing information on forest affairs to the Canadian public.

Campaigns for forest protection through its Publicity Department, the distribution of illustrated literature to settlers, campers, etc., the presentation of lantern slide cartoons in motion picture theatres, and many other methods calculated to bring practical results.

Holds series of illustrated public lectures on forest protection in various sections of the Dominion.

Issues an illustrated monthly, "The Canadian Forestry Journal," which goes to 4,500 members, and to 200 Canadian editors by whom it is quoted extensively.

Holds conventions in various sections of the country to discuss local and general forest problems, and to arouse interest in public forest policies.

A Free Cartoon Service is supplied to newspapers, also a free "cut" service, campaigning for forest protection through interesting illustrations.

These are a few of the concerns of the Canadian Forestry Association.

Support is entirely from voluntary sources. The Association is not identified with any Government or special interest.

MEMBERSHIP APPLICATION BLANK.

Secretary, Canadian Forestry Association,
 119 Booth Building, Ottawa.

I hereby accept membership in the Canadian Forestry Association entitling me to a year's subscription to the Canadian Forestry Journal and all other publications. I enclose \$.....

Class of Membership

Annual\$1.00

Contributing 5.00

Life25.00

Please designate class of membership preferred.

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
119 BOOTH BUILDING, 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 FIRES



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 | Regina
London | Calgary
Winnipeg | Vancouver

Northern · Electric · Forest · Telephones ·