Canadian Forestry Journal

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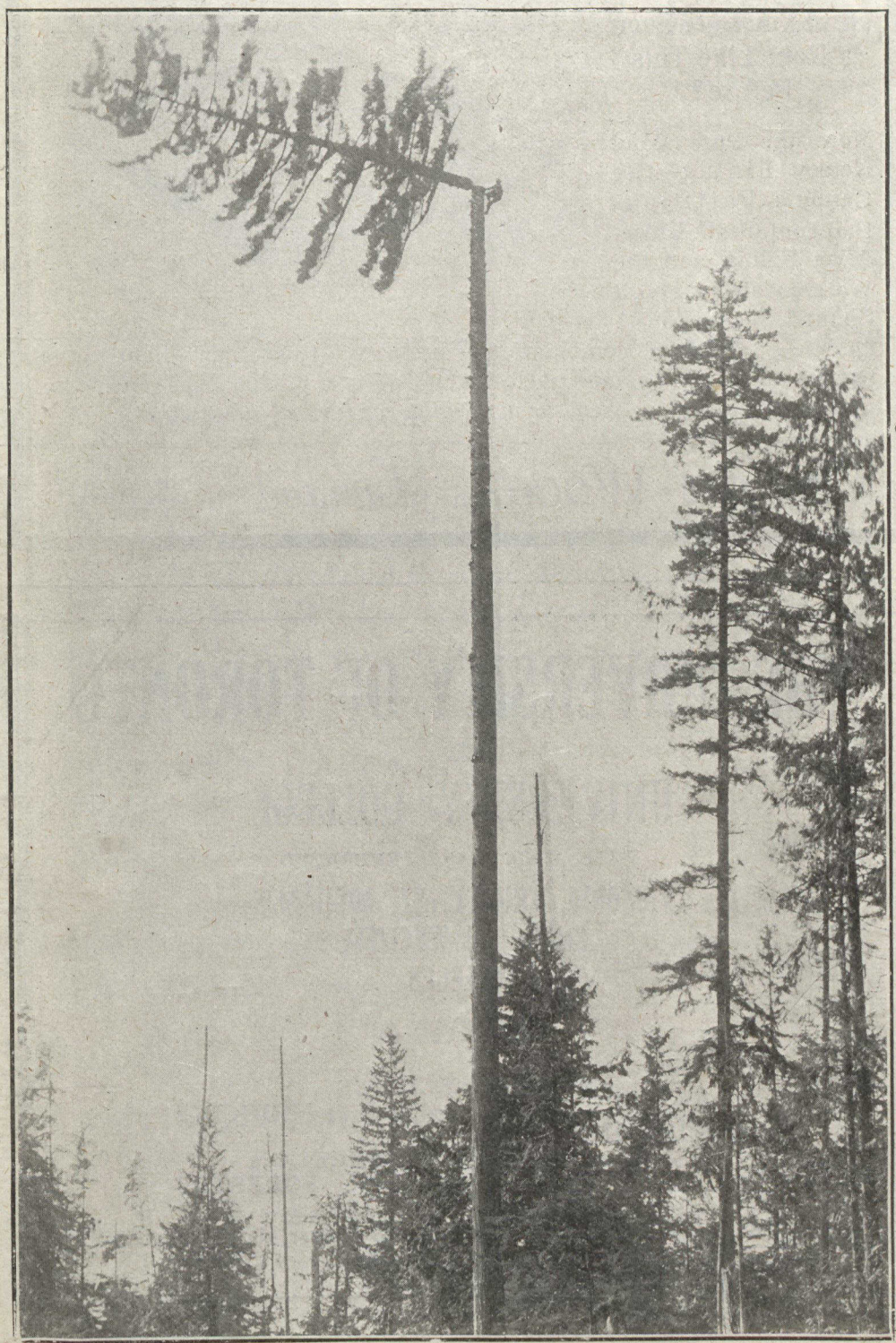

"Topping" a Douglas Fir at a Height of 181 Feet.

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Canadian Forestry Journal

Vol. XIII WOODSTOCK, ONT., JANUARY, 1918 No. 13

CONTENTS FOR JANUARY

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

Wood Fuel to Relieve Coal Shortage in Eastern Canada

By Clyde Leavitt, Chief Forester, Commission of Conservation

SUMMARY

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

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

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

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

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

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

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

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

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

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

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

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

THE FAMINE IN WOOD

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

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

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

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

Need for Education

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

(3) Coal is more convenient than wood for most fuel purposes, in addition to being as cheap or cheaper, the relative fuel values being taken into consideration. The demand for wood fuel is thus limited under nor mal conditions. According to the United States Forest Service, two pounds of seasoned wood have a fuel value equal to one pound of coal. On this basis, a standard cord (4 x 4 x 8 feet, or 128 cubic feet) of hardwoods, such as birch, beech and hard maple, equals one ton of anthracite coal. One and a half cords of hemlock, soft maple or tamarack, or two cords of spruce, balsam, cedar, white pine or basswood are required to make the same equivalent.

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

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

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

The Farmer's Attitude

(6) In ordinary times, very considerable quantities of block wood are cut by farmers from their woodlots during the winter. Under present conditions, however, farmers in general are faced with a severe shortage of labor, which renders them less able than formerly to cut firewood for sale during the winter months. In addition there is less necessity for such action on their part, since war conditions have resulted in bringing to them better returns for their crops than has previously been the case under normal conditions.

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

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

Canada's Dependance Upon U. S. Coal

Eastern Canada can not afford to overlook the fact that a very considerable proportion of her coal supplies must come from mines which are situated in the United States, and over a considerable mileage of United States railways. The coal shortage of the United States has been officially estimated to be not less than 50,000 - 000 tons. Federal and state fuel administrations have been appointed to assist toward solving the very

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

Using Our Forest Materials

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

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

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

A Practical Programme

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

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

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

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

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

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

Continued on Page 1502

Wood Fuel Problems Demand Solution

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

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

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

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

Wood and Coal Compared

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

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

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

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

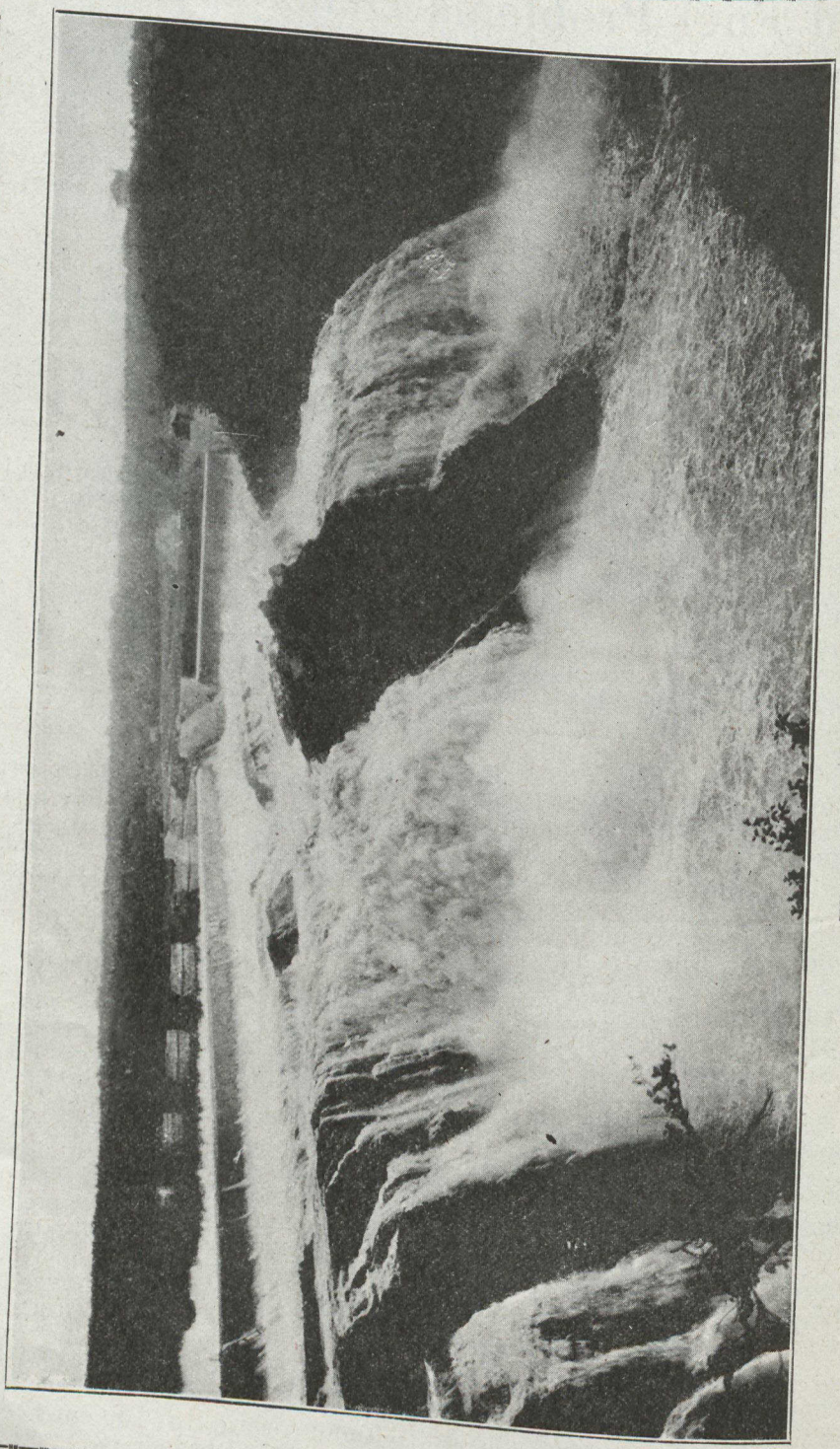
Prices which the consumer can afford to pay for wood as a substitute for coal.

Equivalent price for wood delivered in 16 inch stove lengths.

Price of coal delivered	Hickory, oak, beech, hard maple, ash, elm, locust, cherry	Soft maple, cedar, poplar, basswood.
Per ton	Per Cord.	Per Cord.
5.00	5.00	2.50
6.00	6.00	3.00
7.00	7.00	3.50
8.00	8.00	4.00
9.00	9.00	4.50
10.00	10.00	5.00
11.00	11.00	5.50
12.00	12.00	6.00

Coal Cheaper to Buy

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



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

Courtesy "Sunshine"

Aeroplane Fleets From B. C. Spruce

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

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

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

Eastern Spruce Little Used

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

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

For the Wing Beam

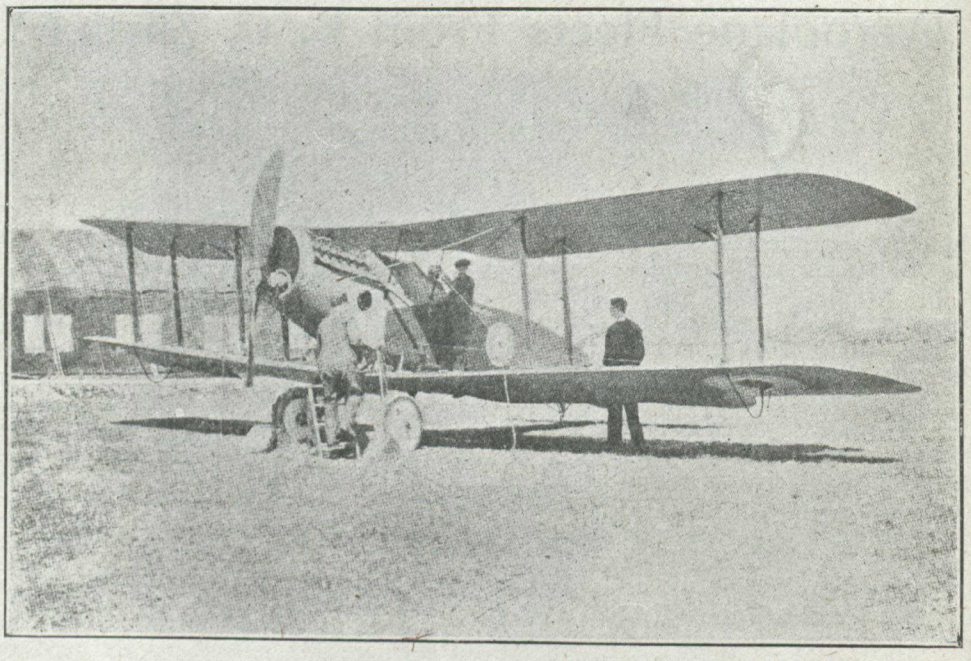
One of the most important parts of an aeroplane is the wing beam, for which, as now constructed, long spruce is required. It is here that the Sitka spruce just meets the demands and it is claimed that on this coast there is an ample abundance of trees which will turn out spruce suitable for aeroplane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

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

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

Only 15% of a Log

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



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

portionately small output which will pass inspection for aeroplane use.

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

B. C. the Only Source

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

The Imperial Munitions Board is now carefully going into the problem of developing the spruce resources of British Columbia to meet the pressing demands of the case. Major Taylor has been sent from the east to take charge of the work, and he is now operating in the province with Vancouver as his headquarters. Mr. H. R. McMillan, formerly Canadian Timber Commissioner, who is thoroughly acquainted with the forest problems of the province, acting as his assistant.

TAKING FOOD FROM FOREST

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

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

—("Forest Leaves")

Forests of the McKenzie Basin

By H. J. Bury, Chief Timber Inspector,
Department of Indian Affairs, Ottawa

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

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

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

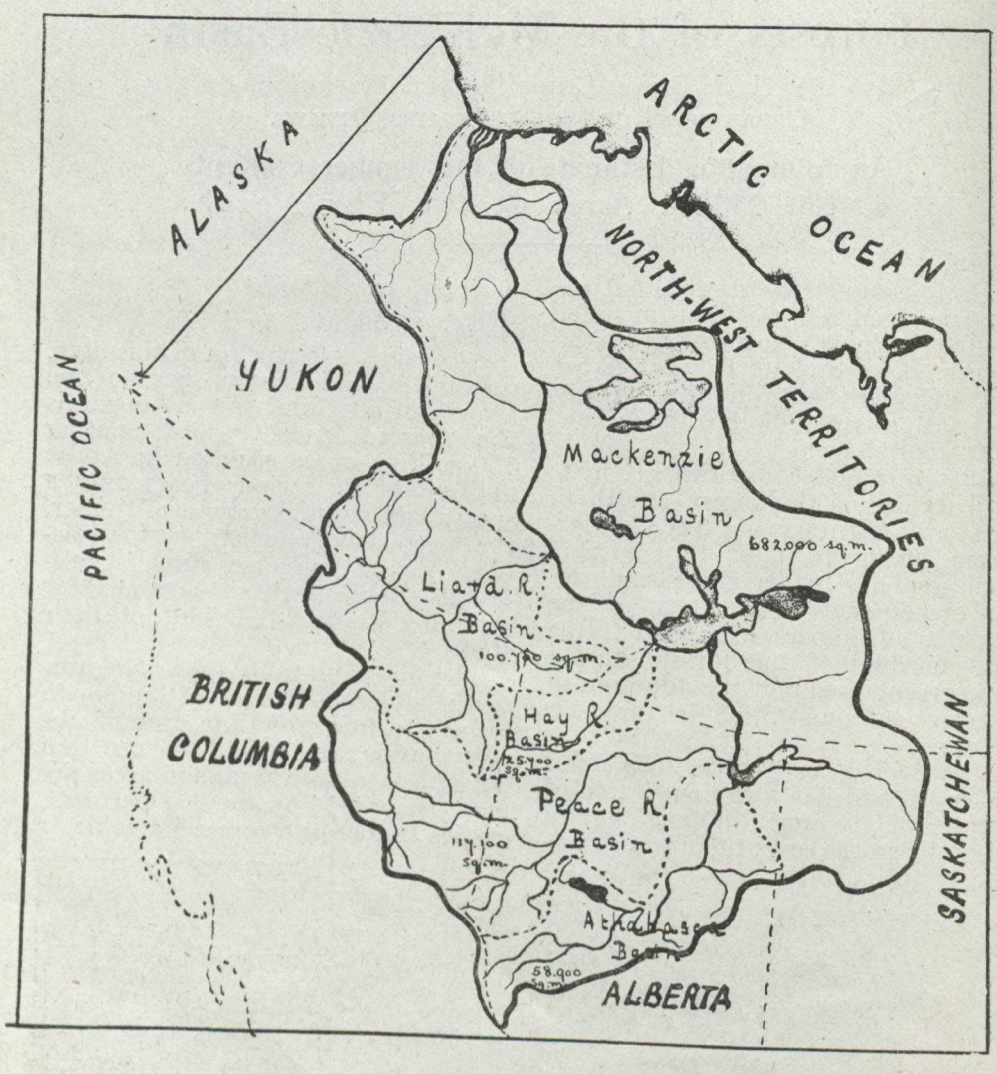
The McKenzie river is 2525 miles in length and has a drainage area of approximately one million square miles, being the seventh largest drainage basin in the world.

("*Land of Little Sticks*")

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

The following table shows the area of the different classes of land with respect to tree growth in each of the river basins, and it will be seen that out of a total of 630 million acres not more than 49½ or about 8 per cent. carries timber of commercial value.

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



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

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

100 *Years for Pulpwood*

In addition to saw-log timber there are approximately 116 million cords of mixed wood.

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

Timber on the Liard River.

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

Forests of the McKenzie Basin

ESTIMATE OF TIMBER RESOURCES.

River Basin	MERCHANTABLE TIMBER					CORDWOOD	
	Spruce & Fir	Balsam Poplar	Aspen feet b. m.	Birch	Banksian Pine	cords Mixed woods	Total saw-log timber feet b.m.
McKenzie	12,800 million	1,500 million	1,000 million	nil.	nil.	30,000,000	15,300,000,000
Liard	9,000 million	4,000 million	3,000 million	1,000 million	1,000 million	25,000,000	18,000,000,000
Hay	1,140 million	750 million	800 million	nil.	350 million	6,000,000	3,040,000,000
Peace	9,000 million	4,500 million	3,000 million	800 million	500 million	30,000,000	17,800,000,000
Athabasca	6,000 million	2,000 million	3,000 million	1,000 million	1,000 million	25,000,000	13,000,000,000
TOTALS	37,940 million	12,750 million	10,800 million	2,800 million	2,850 million	116,000,000	76,140,000,000

TABLE SHOWING CLASSIFICATION OF LAND.

Name of River Basin.	Total area	Area waste land acres	Area covered by sapling or brush growth acres	Area covered by cord Wood growth acres	Area covered by merchantable timber acres	Area of prairie acres
McKenzie	436,000,000	256,000,000	116,000,000	64,000,000	nil.	nil.
Liard	64,500,000	9,500,000	13,500,000	22,500,000	19,000,000	nil.
Hay	16,500,000	3,500,000	5,000,000	4,500,000	3,500,000	nil.
Peace	75,000,000	15,000,000	20,000,000	15,000,000	15,000,000	10,000,000
Athabasca	38,000,000	5,000,000	8,000,000	11,000,000	12,000,000	2,000,000
TOTALS	630,000,000	289,000,000	162,500,000	117,000,000	49,500,000	12,000,000

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

Series of French Lectures for the East

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

ONTARIO'S OPPORTUNITY

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

Woodlands Section Getting Into Shape

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

A. E. Loosen, Bathurst Lumber Co.

Ethelbert McLean, Bathurst Lumber Co.

John P. Lorden, Bathurst Lumber Co.

Arthur McAdam, Bathurst Lumber Co.

Bonaventure Gauthier, Bathurst Lumber Co.

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

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

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

Thos. Lapointe, Brompton Pulp and Paper, Limited.

M. C. Small, Laurentide Company, Limited.

J. H. Hamilton, Laurentide Company, Limited.

Ellwood Wilson, Laurentide Company, Limited.

H. A. Downs, Laurentide Company, Limited.

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

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

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

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

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

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

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

Clyde Leavitt, Commissioner of Conservation.

Committee of organization:

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

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

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

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

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

(Conservation.)

Canada's Foresters Overseas

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

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

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

Toronto's Record

Of the relatively small group of graduates and students of Toronto University Forest School, under Dean Fernow, twelve men have made the supreme sacrifice, while twelve others have been either wounded, gassed or victims of shell shock. From the Toronto school alone, there went forth 4 Captains, 29 Lieutenants, 8 N.C.O's, and 24 privates. Indeed, the only men who did not go were those debarred by physical defects. The profession of Forestry in the degree to which the graduates and students promptly placed themselves at the service of their country and cheerfully accepted a tragic record of casualties surely stands in the forefront of all callings. Many have given their lives whose services were sadly needed by Canada. Letters from the wounded and from men in desolate corners of the field of war, thoroughly homesick and tired of the business of fighting, nevertheless refuse to complain against conditions or express regret that they were called to a perilous and exhausting task.

(*See Next Page.*)

ONTARIO'S RESOURCES OF TIMBER

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

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

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

Canada's Foresters Overseas

DOMINION FORESTRY BRANCH

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

ONTARIO FOREST SERVICE

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

PRIVATE EMPLOY—QUEBEC

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

BRITISH COLUMBIA FOREST SERVICE

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

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

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

UNIVERSITY OF NEW BRUNSWICK FOREST SCHOOL

Name	Training	Civil Position	Date of Enlistment	Rank	Branch of Service	Remarks
Name	Training	Civil Position	Date of Enlistment	Rank	Branch of Servce	Remarks
F. Alexander	Freshman class		1916	Pte.	236h Battal. (Kilties)	now in Montreal
C. L. Armstrong	Jun. at Enlistment	NB. Railway Co. (Cruiser)	1915	Lieut.	23rd Battery	
F. Armstrong	Fresh'n at Enlistment		1916	Lieut.	Won Military Cross,	now at St. John
C. C. Atkinson	Sophomore at Enlist.	N.B. Railway Co. (Cruiser)	1916	Gunner	23rd Battery	
Roland Barnes		N.B Raiway Co. (Cruiser)	1915	Major, won Military Cross.		6th C.M.R., now at Hampton, N.B.
S. Bateman						
E. A. Bellivieau	Jun. at Enlistment		1915	Lieut.	unit 104th Regiment.	
Norman D. Cass	Jun. at Enlistment		1915	Lieut.	Imperial Army—on 3 mos. leave at	
W. A. Edington	Sen. at Enlistment		1916	Lieut.	Signalling Corps	[Fredericton
A. C. Edgecombe	Jun. at Enlistment		1916	23rd Battery, now wounded in England		
L. S. Edgett	Jun. at Enlistment		1915	Lieut.	Killed in Action	
G. G. Fitz Randoplh	Class 1913	Randolph & Baker Co.	1915	Lieut.	Now at St. John, N. B.	
G. M. Gibson	Jun. at Enlistment	Cruiser N.B. Railway Co.	1915	Pte.	23rd Battery	
H. F. Harper			1915	Sgt.		
J. B. Hipwell	Grad. Class 1915	Dom. Forestry Branch	1915	Lieut.	5th Battery, C.F.A.	Killed June, 1916
H. L. Holman	Grad. Class 1915	N.B. Railway Co.	1915	Pte.	23rd Battery	
J. L. Kechum	Grad. Class 1915	Dom. Forestry Branch	1916			Killed in 1916
L A. Kilburn	Junior Class	Crown Land Survey	1916	Gunner	9th Heavy Siege Battery, St. John, NB.	
S. E. Kitchen	Junior Class		1915	Gunner	23rd Battery.	Killed in 1916
G. F. Kuhring	Class 1915		1915	Corp.	23rd Battery	
F. McGibbon	Class 1915	Dom. Forestry Branch	1915	Lieut.		
R. R. Machean			1916	Lieut in Colored Battalion		
C. E. Maimann	Class 1916	Dom. For. Branch in sum.	1916	Corp.	Heavy Siege Battery,	now in England
B. D. Millidge	Class 1916		1916		Heavy Siege Battery	
G. Mowatt	Class 1916		1916		Heavy Siege Battery	
C. O. Orchard	Class 1915		1915	Cycle Corps.	Has won D.C.M.	
H. D. Otty	Freshman Class		1915		Heavy Siege Battery	
R. K. Shives	Graduate Class 1913	N. B. Railway Co.	1915	Flight Lieut.—Flying Corps, killed 1916		
Jas. Smart	Special student	Dom. Forestry Branch	1917	Lieut.	Forestry Battalion	
C. R. Townsend	Jun. Class at Enlistment	N. B. Railway Co.	1915	Gunner	23rd Battery, won Military Medal,	
J. E. Veness	Jun. Class at Enlistment		1915	Lieut at first unit 104th.	(wounded in England	
C. J. Young	Freshman Class	Crown Land Survey	1916		Ninth Siege Battery, St. John, N.B.	

Annual Meeting, Montreal, Feb. 6 and 7.

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

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

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

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

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

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

Will Alberta Reduce Needless Fire Losses?

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

Last year the Canadian Forestry Association brought to the attention of the Governments of Saskatchewan and Manitoba the vital need of a better instrument in forest fire prevention than the "Prairie and Forest Fires Acts" then in existence. Both Governments gave the question careful consideration and finally accepted in its main outlines a draft amendment submitted by the Forestry Association and made this part of a new and vastly improved Fire Act. Fire Commissioners A. E. Ham in Manitoba and A. E. Fisher in Saskatchewan, were to the fore in promoting the cause of better fire protection and found little opposition from their administrative chiefs. Action was taken by both provinces in reducing the risk from settlers' fires started for the purpose of clearing the ground of slash and stumps. Inasmuch as the greater part of new settement is now

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

How the West Has Paid

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

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

A Loophole in Manitoba

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

Alberta, however, did not see its way to adopt the amendments to its Prairie and Forest Fires Act, although the need in Alberta is perhaps even more pressing than in the two sister provinces. Forests have a special importance for the people of Alberta in that they are essential not only to create supplies for farming and stock raising, but to maintain the uniformity of the rivers, to make the irrigation enterprises possible, to give pit props to the coal mines, free fuel and building materials to the northern settler, and support and increase the wood using industries. To all such constructive activities, however, the unsupervised settlers' fire is a perpetual menace. If New Brunswick lives up to expectations this year and blankets the province with a "Permit" system to control clearing fires, Alberta would then be the only province tolerating such a public peril. Wherever the "permit" law has been applied it has proved a conspicuous success, winning the confidence of those who at first created some opposition.

Alberta's Opportunity

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

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

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

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

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

Loaning Money On Limits

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

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

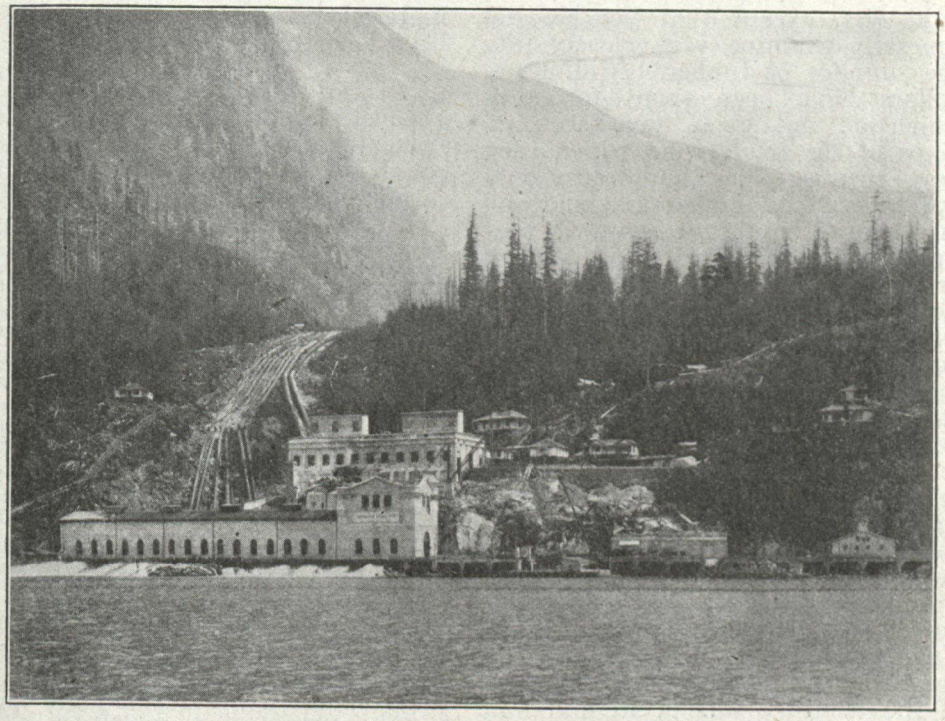
Bankers are practical men, men whose language is dollars and cents, the only profession which does not allow a limit of error. Your books and accounts must balance to a cent. When the physicist or engineer makes a measurement, he knows that it cannot be absolutely accurate and allows for a certain amount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

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

Worked Like a Mine

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

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



Courtesy "Sunshine"

WATER POWER DEVELOPMENT IN BRITISH COLUMBIA

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

we shall need much more. We know the rate at which consumption has increased, so that we can figure that in the future, decade by decade, we shall need so and so much timber. We do not yet know exactly or even approximately how much we have. We have reconnaissance figures for British Columbia and Nova Scotia, a guess for Ontario and partial accurate estimates for Quebec and New Brunswick. We must ascertain roughly our stock, then we must find out how fast it is growing, the amount which is being added year by year, and also the amounts which can be predicted for the lands which have been burnt over and cut over. With these figures before us we can then say that the present stock will last so many years and we shall have to plant so much per year to meet the needs of the future. The prosperity of not only the timber using industries, but also of the country in general, is bound up in this matter. We have the men who can do the work, all we need is an educated public sentiment which will back up our Governments to spend the necessary money and the amounts needed, considering the value of the work is relatively small, nothing like, for instance, the expenditures on good roads or other public works. Reforestation work, once started, is like the familiar advertisement, "it works while you sleep," piling up value in almost geometrical ratio.

The Banker's Viewpoint

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

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

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

Getting Rid of Fire

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

"Sound Common Sense"

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

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

Where Accuracy Counts

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

About British Columbia!

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

Timber limits	8,374,200	acres
Timber berths (railway belt)	1,123,117	"
Crown grants (fee simple)	922,206	"
Timber leases	619,125	"
Pulp leases	354,399	"
Timber sales	64,440	"
Tan bark leases	32,252	"
Total	11,489,739	"

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

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

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

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

Rising Value of Farm Woodlots!

BY "AHMIK" IN THE TORONTO GLOBE

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

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

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

High Prices Secured

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

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

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

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

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

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

Only 10 *Per Cent. Left*

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

Not Learning by Experience

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

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

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

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

Supervision Needed

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

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

"The most inexcusable feature in

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

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

Taking Food From Forest Trees

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

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

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

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

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

large quantities are shipped to the cities where the seed is roasted and sold on the street. The similar seed of the Parry pine and the large Digger pine seeds are eagerly sought by the Indians. The latter tree is said to have gained its name from its use as a food by the Digger Indians. The seeds of the long leaf pine are edible and are improved by roasting. Indeed, it may be said that most nuts are more digestible when roasted than if eaten raw.

Immigration After The War

By W. F. Burditt,

Chairman, Town Planning Commission, St. John, N. B.

As to preparation for immigration, one of the first needs is a thorough survey of all government lands available for settlement. A survey that shall take account of the physical characteristics of the country, the quality of the soil, water supply, laying out of farms of such size and shape and in such a way as to conduce to economical operation, laying out of roads with a view to economical transportation, etc., so as to ensure that the man who goes into the wilderness to carve out a farm will be ultimately rewarded for his labour, and will not find that he had been located on some barren rocky ridge that might have been more profitably devoted for all tme to the growing of timber. Through the lack of such preparation in days gone by, there are hundreds of farms in New Brunswick at the present day upon which the owners, by laborious toil, are scratching out a bare subsistence, and which would yield a better profit if devoted wholly to the production of spruce timber.

Can Forests Be Planted At a Profit?

Ellwood Wilson Before St. Andrew's Literary Club, Montreal

"Let us make a little calculation. If we hold our virgin timber for sixty years at the present rate of ground rent, which by the way is likely to be raised in 1920 and every ten years thereafter, and allow 4 per cent. compound interest, and at the end of that period cut six cords per acre which is a fair average, our wood will cost 31 cts. per cord on the stump. If we hold our cut over lands for sixty years and cut three cords, interest charged at the same rate our wood will cost 61 cents per cord. Now if we plant at a cost of ten dollars per acre, and pay taxes for sixty years, interest compounded at 4 per cent. and at the end of the period cut fifty cords to the acre which is a conservative figure, our wood will only cost us 21 cents per cord. Our logging costs will be much cheaper as will also our fire protection and administrative expense. From a purely business standpoint, reforestation is a sound proposition."

C. F. A. IN NEW OFFICES

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

(*Continued from Page 1476.*)
committees in the several towns should be organized in order that the local committees shall protect themselves against extortionary prices.

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

Connecticut's Plan

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

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

Cut-A-Cord Campaign

The Massachusetts Fuel Administrator has issued a circular entitled "New England Cut-A-Cord Campaign. Stock up the Wood Shed. Coal May be Harder to Get Next Year than This." This circular calls attention to the fact that coal is in great demand all through New England but that in spite of the best efforts of the Fuel Administrator the supply has fallen far behind the requirements, and the situation is serious. The Fuel Administrator says that the outlook for any improvement in future coal deliveries is unfavorable, and it has become the duty of the Administrator to advise the public of these facts and to urge that personal and community prudence and national patriotism require that New England should begin at once to utilize as fully as may be the native cordwood supplies. The opinion is expressed that an organized effort should be made without any delay to provide a store of wood sufficient for immediate and future needs.

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

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

Stop Burning Old Ties

Publicity material, issued by the

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

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

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

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

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

Municipal Yards

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

Let each municipality (1) buy wood by wholesale in large quantities for delivery by wagon or railroad at a municipal woodyard, which should be located on a railroad siding if wood is to be shipped in by rail; (2) equip the yard with power-saws, etc., utilizing such available equipment as the municipality already has; (3) use convict labor, workhouse labor, or street force to do the work; (4) use the municipal teams for delivery of wood to consumer, cut ready for consumption at actual cost; (5) put somebody in charge of the work who is capable of doing it successfully; (6) do not use coal cars for shipping in your supply of wood; (7) if wood cannot be bought in sufficient quantities to supply the municipal yard, contract with land owners for the privilege of cutting the wood under forest conservation restrictions and direct the cutting of the wood with your own labor; (8) encourage consumers to substitute sheet iron wood stoves for their coal burners.

War Fuel Companies

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

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

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

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

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

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

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

Why United States is Short of Coal

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

How Wood Can Help

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

1. Farmers and rural communities generally, within easy reach of wood supplies, should make as general use of this fuel as possible, to relieve the demands for coal and freight cars alike. To a certain extent this would involve reversion to the old-fashioned wood-stove, which has become more or less obsolete, even in such communities. This will, of course, be feasible to a lesser extent in the larger towns and cities.

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

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

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

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

5. Furnaces may be run low, keeping the house in general only warm enough to prevent water pipes from freezing, supplementing this by the use of wood fuel in stoves or grates to keep the living and dining rooms comfortable.

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

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

What Should be Done in Eastern Canada!

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

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

More Cutting Needed

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

Publicity Campaign

Surely, if special organization all

along the line is essential in the United States, to stimulate the production and consumption of wood fuel, to reduce the demand for coal, similar action is even more necessary in eastern Canada, or may be expected to become so before next winter. A campaign of publicity, through the press and otherwise, should be instituted, practically parallel to the extensive campaign for food conservation. It is the order of the day to relieve the strain upon war essentials to the wider use of available substitutes. Action along these lines should be taken whether it later becomes necessary or not for the authority to enforce conservation, in at least some localities, by prohibiting the use of coal between April 15 and December 15. This is a possibility which has been discussed to some extent, and indicates at the very least how seriously the situation is regarded.

Local Government Action

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

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

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

Duty of the Provinces

The Provincial Governments, on the other hand, may render a great public service by entering vigorously into this campaign. Some one familiar with conditions, preferably working under the direction of the Provincial Forester, should take these matters up actively with city and municipal governments. A campaign of education may be expected to stimulate both the production and consumption of wood fuel. In some cases, no doubt, timber on Crown lands will be found to be commercially accessible to a specific market; in such cases the provincial authorities may reasonably be expected to assist materially in the completion of necessary arrangements for cutting. The saving in stumpage cost on Crown Lands, over the privately-owned timber nearer to the towns and cities, should at least go far toward overcoming the higher cost of rail transportation in the case of the former.

Municipal Competition

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

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

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

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

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

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

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

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

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

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

.....

Canadian Forestry Journal, Ottawa.

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

Name.....

Address.....

ONTARIO FOREST BRANCH SHOULD CONTROL CUTTING

(*From "Conservation"*)

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

THE LATE HON. RICHARD TURNER

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

ITALY STOPS BIG OUTPUTS

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