

# Canadian Forestry Journal

Vol. XIII.

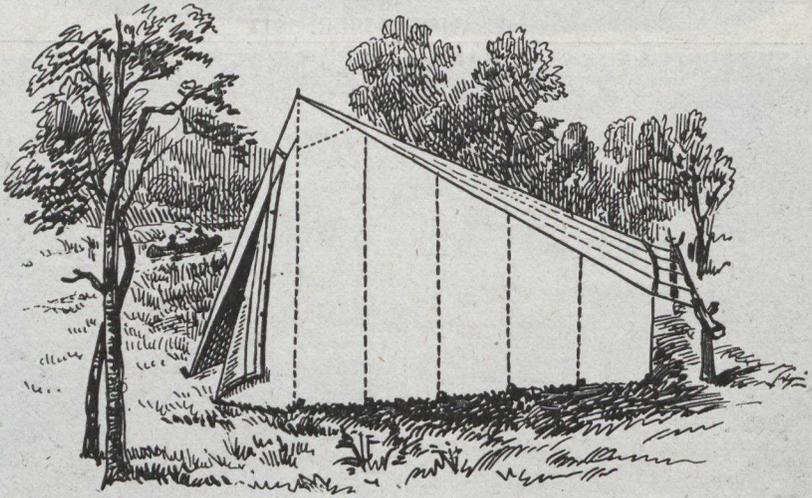
NOVEMBER, 1917

No. 11



ON A NEW BRUNSWICK DRIVING STREAM

# TENTS



SEND FOR OUR CATALOG.

ASK FOR PRICES AND SAMPLES.

*Smart-Woods, Limited*

OTTAWA  
TORONTO  
MONTREAL  
WINNIPEG

## THE UNIVERSITY OF TORONTO

AND

### UNIVERSITY COLLEGE

WITH WHICH ARE FEDERATED

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

FACULTIES OF

ARTS

APPLIED SCIENCE

MEDICINE

EDUCATION

HOUSEHOLD SCIENCE

FORESTRY

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

CIRCULATION, NOVEMBER, 6,400 COPIES

# Canadian Forestry Journal

Vol. XIII.

WOODSTOCK, ONT., NOVEMBER, 1917

No. 11

## CONTENTS FOR NOVEMBER

A Victory Over Patronage .....	1377
Some Causes of 1917 Timber Losses .....	1382
An Adirondack Forest Experiment .....	1384
Making Rugs from Paper Fibre .....	1401
Nova Scotia's Forest Position .....	1389
Will Russia's Forests Pay Her War Debts? .....	1390
The Story of Canada's Forests .....	1395
Over 7,000,000 Trees Planted on the Prairies in 1917 .....	1392
Searching for Aeroplane Woods .....	1379
Forest Nursery Plans Great Extension .....	1394
Canada's Debit Account for Forest Fires .....	1383
Recollections of Canada's Greatest Forest Fire .....	1409
Manitoba, A Forest Province .....	1394
Settlers at Peace River Pay Penalty .....	1414
New Brunswick Forestry Meetings .....	1405
The World Over .....	1408

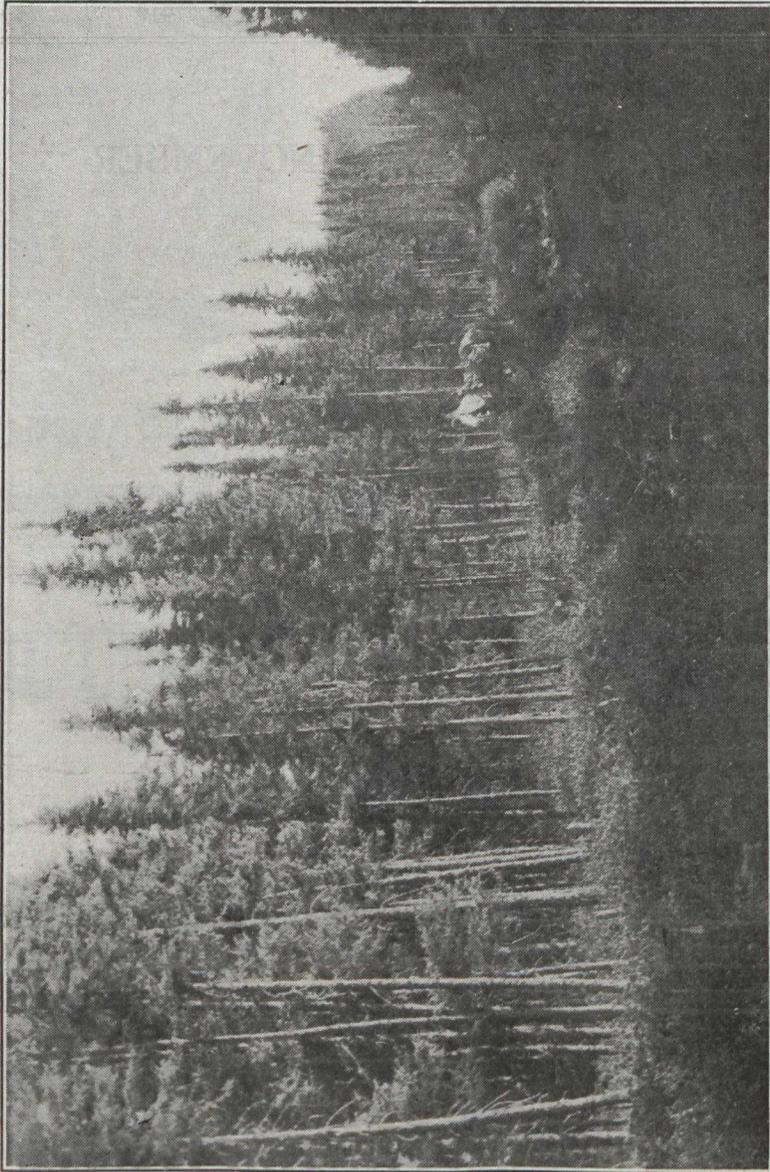
The Canadian Forestry Journal will be sent to any address for one dollar a year, subscription including all other publications of the Canadian Forestry Association.

*Address all Communications to*

**THE CANADIAN FORESTRY JOURNAL**  
119 BOOTH BUILDING, OTTAWA

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

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



Dense Stand of Black Spruce, Muskeg, Riding Mountain Forest Reserve, Manitoba, Sixty Years Old

# A Victory Over "Patronage"

## Important Work of Western Forest Protection and Development Freed From Political Millstones.

The ousting of "patronage" from its long-entrenched position as dictator of Federal Government purchases and appointments may be accepted as one of the most gratifying "drives" in Canadian political history. What a true merit system in making appointments to the "outside service" of the Dominion Forestry Branch, for example, will mean to the Canadian people cannot readily be realized but most certainly the cutting out of "patronage" constitutes the greatest boon to which that department could fall heir. Furthermore, the success of the new principle may easily lead to its adoption by those provincial governments yet adhering to the prickly advantages of "patronage" in making appointments to the forest services.

### *A Bouquet from Winnipeg*

Most certainly, the prying loose of this keystone of Tammanyism in Canada has evoked an almost unbroken paeon of rejoicing from our newspaper editors, quite irrespective of political affiliation. Perhaps the strongest expression of all comes from the Winnipeg Tribune (Independent) which characterizes as a "damned scoundrel" any man who ever attempts the restoration of patronage in Canada.

A very considerable part of the newspaper campaign against patronage was in response to efforts of the Canadian Forestry Association for months past to point out the mischief wrought by the iniquitous system in the Dominion Forest Service. Every newspaper in Canada, having any substantial circulation, was provided with quotations from the Civil Service Act demonstrating the simplicity of bringing "the whole or any part of" the outside service under operation of the Civil Service Commissioners at Ottawa by a mere Order-in-Council.

Following is one of the Association's summarized statements which found wide use in the leading papers:

### *Technical Services*

"First steps in Civil Service Reform."

"There are certain obvious "first steps" in carrying out the reform of the Dominion Civil Service, as promised in the Union Government's initial manifesto. The Civil Service Commission of Ottawa has been asked to report on a plan for liberating the thousands of Government employees outside of Ottawa from the fetters of the local patronage committees, so that appointments and promotions shall be determined through the Civil Service Commissioners alone. While ultimately all Government officers, whether in Ottawa or in the "outside service" must be brought under the operation of the merit system, certain branches of the Government's work call for immediate application of the new plan for the riddance of patronage.

"It is doubtless highly desirable that not even a junior clerk in a town post office should be manipulated by a local political ring, but it is of much more account that the members of technical services should come in for the first application of patronage relief. One of these technical services is the Dominion Forestry Branch, with a large staff of field men responsible for the protection from fire of the enormous areas of forest in the prairie provinces and a section of British Columbia.

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

Such a responsibility as devolves upon the Dominion Forestry Branch and other technical services ought to be freed with minimum delay from the blight of the patronage business. If there is to be any gradual introduction of the Civil Service merit plan into the "outside services," the technical departments which suffer most gravely are due for prompt action."

#### "An Insufferable Nuisance"

"Patronage committees," said Toronto Saturday Night, "have become an insufferable nuisance to the Civil Service itself, particularly in technical branches like the Forestry Department. The scientific heads of such departments could not make suitable appointments of men with technical knowledge without being impeded by the threats and importunities of patronage committees whose members knew nothing or cared nothing about the duties to be performed."

#### A Proper Beginning

"The Forestry Branch," comments the Independent Hamilton Herald, "has not been a solitary sufferer. The patronage blight has fallen upon every department of the public service. But the Forestry Association is right in holding that the merit system should begin in the service where special technical knowledge is necessary to efficient work."

Says the Halifax Chronicle:—

"What is true of the Forestry Branch is true, in greater or less measure, of all departments of the Administration, and it is to be hoped that the Government will lose no time in putting its declared policy into operation, not only as regards appointments but all business of the several departments."

#### "A Brake on Progress"

"The ramifications of the patronage system are endless; they reach into depths that are unfathomable," argues the Ottawa Evening Journal. "The patronage system has been a brake upon political and economic progress, and has been responsible for more evils than the ordinary man

can begin to appreciate."

Then speaking of the Forestry Association's assertion regarding interference with technical positions, the Journal adds:—

"Was there ever anything more absurd than the application of the patronage system to the selection and appointment of technical officers in the public service?"

#### Sir Robert's Manifesto

The Union Government's assurance of future national immunity from the contagion of the patronage pot has been set down not only in very definite terms but by most practical action. Sir Robert Borden's second manifesto contains this statement:—

"The system of patronage in the distribution of contracts and office which has prevailed in Canada for generations has been the root of many political evils. But inveterate diseases succumb only to heroic treatment—and heroism has not distinguished Canadian parties in dealing with patronage. Hence the resolution to abolish trading in patronage, to fill public office by merit and not by favoritism, and to establish honest and open competition in awarding contracts and buying supplies."

#### Mr. Crerar's View

Hon. T. A. Crerar likewise commits himself to the policy of Civil Service Reform in these words:—

"I am glad to say that one of the most important announcements in the statement of the new administration is that paragraph dealing with the patronage evil in Canada.

"The sole basis upon which people should be brought into the public service is their fitness for the position."

#### "We Mean Business"

Hon. J. A. Calder's pronouncement, no less emphatic, is reported in the Winnipeg Tribune as follows:

"We believe that the time has come when an honest and sincere effort should be made to improve the civil service in Canada. Our civil service should be taken out of party

politics and men appointed to the service on grounds of efficiency and necessity and not on purely political grounds.

"I am talking sincerely to you men and women to-night and voicing the opinions of every member of this new government. We mean business."

#### *How The Commission Feels*

As an earnest of the Union Government's intentions, the Prime Minister requested the Civil Service Commission to prepare at once a plan whereby the outside section of the Civil Service can be brought forthwith under sole control of the Com-

missioners. A meeting of the deputy ministers and heads of departments was called by Dr. M. C. La Rochelle and an illuminating discussion resulted:

"You need not fear," observed Dr. La Rochelle, "any bad will or obstinacy on the part of the Commissioners. To the contrary, it is their earnest desire to co-operate with you and to do everything to facilitate the coming period of transition. It is their intention to frame a system of examinations, where examinations can be used, which will be submitted for your approval and that of the Governor-in-Council."

## *Searching For Aeroplane Woods*

The extensive utilization of British Columbia spruce for the manufacture of aeroplanes has called into the service of the Imperial Munitions Board a special staff of technical foresters, among whom are Mr. H. R. MacMillan and Mr. Roland D. Craig, the latter being "loaned" by the Commission of Conservation for an indefinite period.

The President of the Canadian Aeroplane Company, virtually a British Government creation, when at the coast recently made a thorough investigation of the possibilities. He said that there were great tracts of spruce in the province which would exactly meet the required conditions for aeroplane construction. The supply of spruce in eastern Canada was very limited and the manufacturers were compelled to look to the Pacific Coast. Considerable of the material now used comes from Washington, but the preliminary reports as to a supply from British Columbia as well as the suitability of the shipments already made were causing all aeroplane manufacturers to look toward British Columbia. Greater length and greater diameter than is now being supplied is what is sought in spruce for aeroplanes. One British Columbia district from which good reports as to a field of supply had been received was in the northern section

in the Queen Charlottes and around Swanson Bay.

The Italian government is proposing to use fir as a substitute for spruce in aeroplane manufacture owing to the difficulty of securing spruce of proper size and quality. It is reported that a contract for 25,000,000 feet has been made with Washington lumbermen.

#### **B. C.'S TRADE POSITION**

British Columbia mills have a possible output of 2,500,000,000 feet per annum of lumber, according to an estimate made by the "Victoria Colonist." On that side of the continent, says the "Colonist," there is the largest supply of merchantable timber. Pulp and paper mills when fully in swing will be able to supplement the shortage of products in the east and probably indefinitely supply the demand for paper. In the years 1912 to 1914 not more than five per cent. of the foreign lumber export trade on the Pacific was handled from the western ports, notwithstanding the natural resources, which are greater than all the States to the south. The figures, therefore, show that British Columbia, which is in a position to supply the major portion of the demand, is only in a small minority in actual trade.

# Will Russia's Forests Pay Her War Debts

BY A. J. SLACK

DIRECTOR, RUSSIAN INFORMATION BUREAU, NEW YORK

During the year 1915 the debit balance of Russia's foreign trade amounted to \$385,000,000. During 1916 it rose to over \$1,000,000,000. This was partially produced by war conditions, but after the war Russia must pay the interest on her national debt, and, therefore, the question of turning the balance in favor of Russia is one of the most important problems of Russia's economic life at the present time.

This problem is solved in a very interesting manner by the possibilities in the development of Russia's timber industry. The timber export even nowadays holds second place, following grain, in Russia's export trade.

## The Advance of Export

In 1892 the receipts from the timber industry in Russia's ordinary state revenue amounted to \$9,572,000—1.9 per cent. of the entire amount of state revenue. In 1913 the receipts from the timber industry increased to \$46,11,176—27 per cent. of the entire amount of state revenue. During the period 1892-1913 the entire income of the imperial treasury was multiplied 3.5 times, whereas the income from the timber industry was multiplied 4.9 times.

The export of Russia's timber developed even faster than the timber industry in general. In the beginning of the nineteenth century, the export of Russian timber amounted to only \$765,000—1.7 per cent. of the total amount of Russia's export at that time. In 1910 Russia's export of timber already amounted to \$70,482,000—9.5 per cent. of the total export. During the period 1800-1913, the total amount of Russia's export multiplied 21 times, whereas the timber export multiplied 126

times. It is interesting to observe that during the same period the amount of grain export multiplied only 44 times.

## Russia's Vast Forests

In 1913, as we have said before, Russia exported timber to the amount of \$84,099,000. But this amount is surely negligible compared with the possible export of timber. In exporting grain, Russia meets the competition of the United States, Argentina, Canada, the East Indies, Australia, Bulgaria and Rumania. But in exporting timber, Russia certainly can take and is going to take the leading place in the world's market.

I.

	Amt. timberland (in acres)
Germany .....	38,430,000
Balkan States.....	28,380,000
France (without colonies)....	27,141,000
Spain (without colonies).....	17,844,000
Italy (without colonies) .....	11,256,000
Great Britain (without colonies) .....	3,375,000
Other European countries ..	6,426,000
Total.....	132,852,000

Russia holds over 1,125,000,000 acres in timberland.

## Future Readjustment

This table shows that timber is needed in all the European countries, exclusive of Russia, Scandinavia and Austria-Hungary. The import in Europe from the United States is comparatively small. Canada, perhaps in the near future, may become a great exporter of timber. Russia's chief competitors in the European timber market will be Scandinavia and Austria-Hungary. But the ex-

port from these countries has been diminishing during the last years. Scandinavia showed a tendency to increase the export of paper. As to Austria-Hungary, for the last years her competition with Russian timber has also become weaker and weaker. During the period 1906-1910, Russia exported to Germany 48.8 per cent. of all timber imported by the latter country. Austria-Hungary held second placé, having exported to Germany 31.4 per cent. Since then, for the last three years before the war, Russia's export to Germany increased to 50 per cent. of the entire amount of timber imported by the latter. In the same time Austria-Hungary's export to Germany diminished and became only one-half of the amount Germany imported from Russia.

*Britain's Purchases*

The report of the Russian Consul in London, published a year ago, shows very clearly how wonderfully for the last years Russia is advancing in the European timber market. Until lately 70 to 75 per cent. of Russia's entire timber export went to Germany and England. During the last years it went to England more than to Germany. The per cent. of timber imported in England for the last 10 years from Russia, Scandinavia and the United States shows how successful was Russia's export for this period.

	1903	1907	1909	1911	1913
Russian timber—	29%	37%	46%	47%	51%
Scandinavian timber—	23%	32%	25%	25%	25%
United States timber—	33%	28%	27%	26%	22%

Withal, until now Russia has not really utilized her wonderful timber resources. If we compare the export of timber in 1913, from Russia, the United States, Scandinavia and Austria-Hungary, with the amount of timber land in these countries, we see that Russia, while richer in timber land, is behind the other nations in the amount of foreign trade in timber.

	The amount of timberland (in acres)	The export of timber (in dollars)
Russia .....	1,125,000,000	\$89,250,000
U. S. ....	603,000,000	134,437,000
Scandinavia	81,000,000	129,489,000
Austria-Hungary-	63,000,000	79,203,000

*Will the Forest Pay for War?*

The new Russian Government and the Russian people understand that after the war the need of timber in the European market will open wonderful prospects for the Russian timber industry. By proper development of this industry, Russia will be able to deliver the bulk of the timber necessary for the European countries. It is very possible that in this line Russia will not meet serious competition, neither from Scandinavia nor from the New World. As to Austria-Hungary, she will have her own needs, and aside from this, a big part of her rich timber lands in Galicia was destroyed during the war.

The development of Russia's timber industry and the export of Russian timber to the European market means for Russia the practical solution of most of her financial difficulties that are bound to arise after the war. The development of the timber industry will create a favorable foreign trade balance and will assist in the payment of the national debt.

**A MARITIME MEMBER'S VIEW**

From a Chatham, N.B. Life Member of the Canadian Forestry Association: "I enclose my cheque for \$15. The Association is an excellent one, is doing most praiseworthy work and deserves support."

More than \$7,500,000 are paid annually into the provincial and federal treasuries of Canada as timber and pulp-wood dues by commercial companies. British Columbia receives the largest amount, over two million dollars a year.

# Some Causes of 1917 Timber Losses

## The Preventable List Continues to Loom Large. British Columbia's Fire Damage Summarized.

As fire protection systems become more thorough, it will be possible to learn more accurately the causes of the annual series of forest fires. Already the gathering of data is fairly thorough in many sections of the country, but taking Canada's forest areas as a whole it is impossible at the present time to compile statistics of fire loss of more than approximate reliability, or with more than a partial listing of the causes. The ascertaining of causes is of the highest importance in fixing responsibility and directing educational efforts towards prevention.

The Forestry Journal is able this month to present the statistical record of British Columbia's 1917 forest fire experience, the figures of which while not final are approximately correct:

**Total Fires in Province during 1917—930.**

Fires upon which extra help was employed—345.

Total area burned over—211,455 acres.

Area of merchantable timber damaged—89,000 acres.

Amount merchantable timber damaged—213,360,000 F.B.M.

Amount of merchantable timber salvageable—38,933,000 F.B.M.

Losses in:

Merchantable timber .....	\$178,401
Valuable reproduction .....	6,563
Standing timber on old burns and cut over lands .....	125
Damage to stock range .....	6,075
Forest products, buildings, railway and logging equipment etc. ....	182,004

**Total Losses .....** \$373,168

Lives lost fire fighting—8.

Horses lost—11 (in one fire).

Prosecutions for infringement of provisions of fire law 8, convictions 6,

cases dismissed 2.

As to the causes, the Journal has not yet received official information. Local reports and the statements of some of the District Foresters assign definite origins for some of the worst conflagrations as follows:

**Spruce Valley fire:**—Dropping light ed tobacco on the floor of a tent; also the presence of a heavy lumbering slash.

**Kalamalka Lake fire:**—An unextinguished camp fire left by a fishing party.

**Crows Nest Valley fire:**—Heavy debris in neighborhood of mill which caught flying sparks.

In the territory of the St. Maurice Forest Protective Association, Quebec, (about 12,000 square miles), 217 fires occurred in 1917, of which no fewer than 122 were set by railway locomotives. Mr. Henry Sargins, the manager, gives the following origins:

Railways.....	122
Sectionmen.....	4
Unknown .....	38
La Loutre Dam. Const.....	26
Drivers.....	5
Constructionmen.....	8
Fishermen.....	8
Settler.....	4
Jobbers.....	2
<b>Total.....</b>	<b>217</b>

It will be noted that the settler, recently the most prolific source of forest damage, has dropped to second to last place in the list. This is a fine tribute, indeed, to the success in applying the "permit law" for the setting out of land clearing fires. While the St. Maurice association commenced its career with a number of prosecutions and convictions of settlers for causing fires (and these doubtless, were salutary) it has directed its main effort towards winning the good will and co-operation of the

settler and has been eminently successful.

The fire losses on the St. Maurice Association's territory this year have been kept down to a very gratifying point.

Of merchantable timber, the loss was 287 acres; young growth 216 acres; cut over lands 2272 acres; old burn 1592 acres. Total 4367 acres, or a little less than 61 square miles.

## Canada's Debit Account for Forest Fires

*Forest fires in Canada since Confederation have destroyed vastly more of the nation's wealth than all other kinds of fires put together.*

The fire losses paid by insurance companies in Canada since 1867 amounted to \$272,250,777. The actual property loss is ascertainable at about 25 per cent. over the foregoing figure. This refers to ordinary property, houses, contents, factories, etc., and includes practically no standing timber which only in rare instances is insurable and that only during the past few years.

It has been generally accepted as a modest estimate that for every foot of timber ever cut in Canada, seven have been destroyed by fire.

Placing government stumpage dues at the very low rate of 50 cents a thousand feet it is not unreasonable to assume that the public revenues have suffered by scores of millions of dollars. It may not be fair to accept such a total as a thousand million dollars, as does the Montreal "Financial Times," because Government dues would not have been collected by any means on all the timber that has gone up in smoke, although every square mile of public-owned forest must be regarded as possessing potential public revenues. If one considers the actual and potential sources of gain to the Government treasuries, probably a billion dollars is not extreme as the total of the penalty visited upon the Canadian people through forest fires.

### CLEANING UP DEBRIS

The following appears in recent advertisements of an auction sale

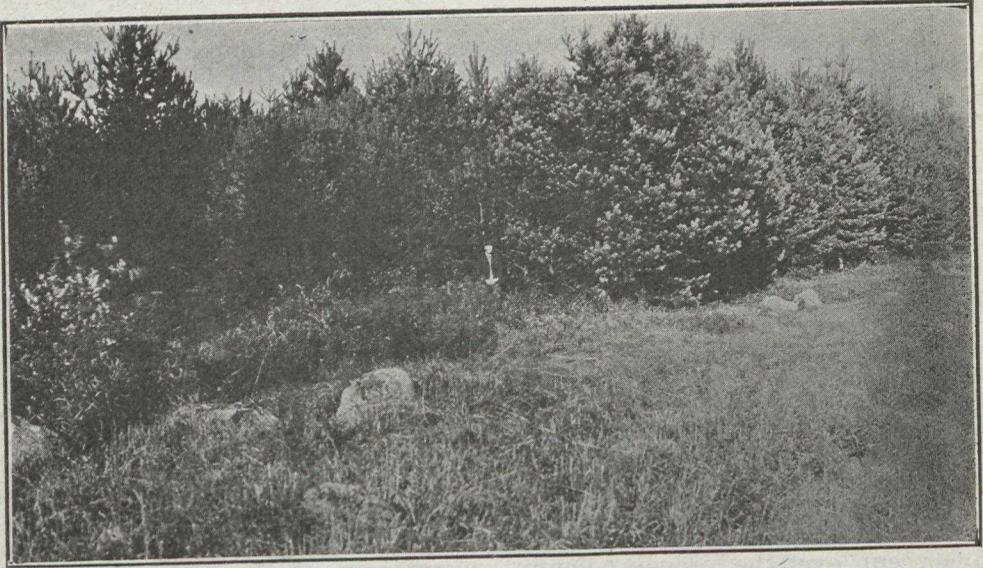
of timber berths by the Department of Indian affairs:

"Half of the cost of adequate fire guardianship will be a charge against the licensee, and the safe disposal of brush, tree-tops and other debris resulting from the lumbering operations must be arranged for under the supervision of the Department."

The provision regarding brush disposal is being carried out with commendable care and is said to have met with willing cooperation from the licensees.

### SEEK BETTER METHODS

The British Columbia Loggers' Association is a helpful organization. The latest work undertaken for its members is the inauguration of a department which undertakes to teach the foremen and buckers how to cut the logs to the best advantage. In carrying out this work the services of A. L. Bryant, formerly supervisor of scalers, has been secured. His duties will be to visit the logging camps of the members and check up the system of cutting the logs, pointing out if necessary where the logs can be cut to the best advantage, considering both taper and grading. The fir, cedar and spruce logs are graded into three classes. It is the intention perhaps next spring to purchase a motor-boat for this service, thus making the inspector independent of the regular boat service.



Sixteen Year Old Scotch Pine, Axton, Adirondacks

## An Adirondack Forest Experiment

BY R. H. CAMPBELL, DIRECTOR OF FORESTRY, OTTAWA

**Removing Hardwoods to Encourage Conifers. Dr. Fernow's Plan of Management Well Justified.**

In a recent article in the *Revue des Eaux et Forêts* on the Moral Responsibility of Foresters it was pointed out that the full results of the forester's work are often not apparent until after he has passed from the scene and, referring to one of the French foresters of the beginning of the last century named de Buffevent, makes the following note on an idea of his for fixing the moral responsibility, even though a posthumous one, on the individual forester for his work:—

"De Buffevent attempted to fix this undetermined responsibility. He thought of inserting in one of his studies of management a table indicating, for each cut, the names of the foresters who had marked the trees to be left standing and at the same time mentioning the number of

such markings, old and new. That is an idea worth careful consideration and if the official statement of management does not give sufficient publicity could it not be increased by inscribing on the tract itself the names of those responsible for the system followed. A plate of enamelled iron, placed upon a corner at one angle of the cut, would be sufficient to show the following generation the names of those to whom it owes its riches or its poverty and, although too often posthumous, gratitude or cursing would have its proper object."

This passage occurs to the mind in connection with a recent visit to the tract in the Adirondack Mountains in New York State which was at one time put in charge of the Forest School at Cornell University, and the plan of operations therefor laid out

by Dr. B. E. Fernow. There was much discussion and argument at the time as to the wisdom of the plans adopted and the opposition to it developed to such an extent that the whole of the experiment had to be abandoned before it was well begun, but sufficient remains to show what would have been the results if the experiment had been carried through to completion and the showing is one to which Dr. Fernow has no reason to be ashamed to have his name attached in any manner, and public opinion which at the time of the inception of the experiment was inclined to be severely critical has changed its attitude and is now inclined to praise.

#### *Demonstration Tract Created*

Shortly, the history of the tract is as follows:—

The New York State College of Forestry was established by an act of the State Legislature in 1898 as a department of Cornell University and in the same act provision was made to establish a demonstration forest of not more than 30,000 acres for the purposes of education and instruction in the principles and practice of scientific forestry. The forest area obtained for the purpose is located in Franklin County on the Raquette River and had been partly logged over by the Santa Clara Lumber Company. The headquarters of the tract were at Axton and the town of Tupper Lake, a saw mill centre located on the Ottawa and New York Railway, was within easy reach, being only three miles from the western boundary of the tract. About one-half of the property was virgin timber, the other half more or less culled of pine and spruce and a small portion burned over land. The stand was composed of sugar maple, yellow birch and beech, mixed with spruce and hemlock, and in some parts with white pine. Most of the merchantable pine had been taken out in the lumbering operations and also considerable of the spruce. There were also balsam and cedar swamps and the burnt over lands were largely

grown up to aspen, poplar and white birch. In quantity the hardwoods were to the softwoods in the proportion of two to one.

#### *Supremacy of Conifers*

The problem to be dealt with and the methods proposed may best be stated in Dr. Fernow's own words:—

“The most valuable crop to be grown in the Adirondacks—and, as for that, in most locations of the Northeastern United States—and especially for the State, are the conifers. Coniferous wood represents three-quarters of the total wood consumption of this country and there is no reason to expect a change. Spruce and white pine hold now and promise for all future to hold the most important position in the northern market, hence their reproduction should be the main object of the forester's skill. Mixed with the hardwoods, as they originally were, the white pine, culled out as the most easily marketable wood, has been almost eradicated in the Adirondacks, because it cannot reproduce under the shade of the remaining deciduous trees and spruce; the spruce being more tolerant of shade, has persisted in producing young growth but by culling it out of the mixed forest, as it is culled in the usual lumberman's fashion, with the hardwoods left, not only is the development of the young spruces retarded and stunted, but in the composition of the crop it must, by necessity, take a less prominent part.

#### *Hardwoods Superfluous*

“It is then the reduction and removal of the old hardwoods, which alone assures success in the silvicultural program of re-establishing and giving advantage to the conifers. If this program be conceded as correct, then it might appear even good business policy to be satisfied if only the cost of removal of the undesirable material were covered by its sale. To find a market for the hardwoods, minor material as well as logs, is the key to the solution of the silvicultural problem; increase in the proportion

of the more valuable spruce and pine."

The disposal of the hardwoods was then the first problem to be undertaken. The mills at Tupper Lake, the most convenient railway connection, took their logs out by water and were cutting only softwoods. It was necessary to provide some means for utilising the hardwoods which included the carrying of them by rail to Tupper Lake. A great deal of the hardwood was, however, only suited for fuel but could not stand the cost of the haul to any market which would be large enough to absorb it.

#### *Stave Plant Erected*

Not to follow out the details of the negotiations it may be stated that finally the Brooklyn Cooperage Company were induced to enter into a contract to erect a stave mill and a wood alcohol plant at Tupper Lake and a railroad to take out the material from the woods, the company to get the entire hardwood crop, logs and cordwood, that might be cut for the next fifteen or twenty years, delivered to them at the railroad at a fixed price. The Brooklyn Cooperage Company were already the operators of stave mills for supplying the American Sugar Refineries, but the wood alcohol plant which was suggested to utilise the smaller and rougher material was a new enterprise to them. Almost immediately after the contract was entered into in 1901 costs of labor and supplies rose rapidly and it was found that to continue to supply the hardwoods under the contract would involve a loss. This losing contract for the state helped with other things to precipitate the trouble which finally brought the experiment to an abrupt conclusion.

#### *Contract Criticized*

The contract has been criticised as improvident but it may be pointed out that there were many other contracts made at the same time that ended as unprofitably and for the same reasons, and that this contract received criticism beyond others be-

cause it was a public contract and therefore open to general criticism. Whether better business management in the operations in the woods could have prevented the loss even under the contract as it stood is possibly a matter for argument, but no opportunity to demonstrate it was given and it may fairly be suggested that in the first essay at such an important experiment by the state the question of profit might very well have been left outside of consideration until the methods were demonstrated.

#### *Industries Now Flourishing*

As a result of the situation the wood alcohol plant was closed down but the cooperage plant continued to operate and later the wood alcohol plant was started again to utilise the waste of the stave mill and both of these industries are found to be flourishing at the present day. The Oval Wood Dish Company of Michigan is now also establishing a plant at Tupper Lake for manufacturing hardwoods, particularly the dishes that give the name to the Company, and Tupper Lake is thus becoming an important centre for hardwood manufactures. It is possible that this might have been the result in any case but the fact remains that the initiation of business on such lines was due to the College experiment and that the local inhabitants are prepared to give the credit to it for the bringing about of the establishment of hardwood industries in the town.

#### *The Planting Programme*

The discussion of the hardwood industries has been carried through to a conclusion as it seemed to be simplest and clearest to do so, and we may not return to its effect on the woods operations. The disposal of the hardwoods being provided for, it was possible to make almost a clear cutting and in order to ensure a fairly full restocking with conifers it was necessary to provide for considerable planting. A forest nursery was therefore started at Axton followed by another one in the Wawbeek Division

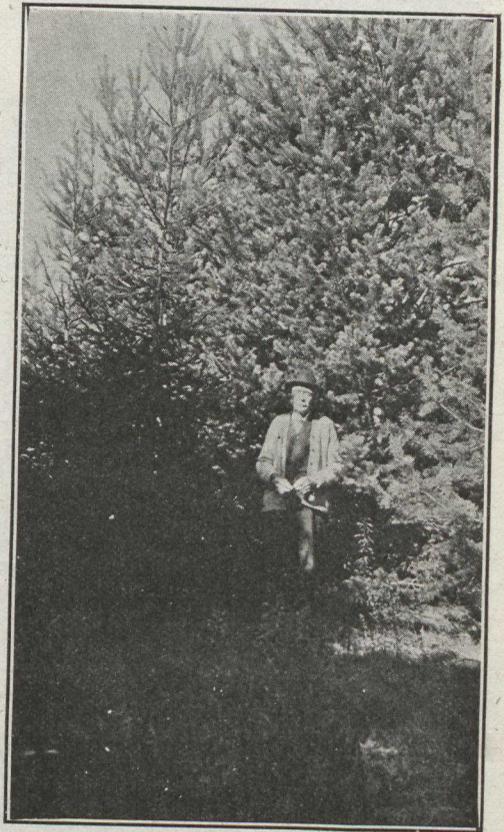
of the tract. The reason for providing the second nursery was in order to get better soil than was available at Axton and also to have a supply of nursery stock near the scene of operations. The Wawbeek Division, being nearest to Tupper Lake, was to be cut over first. In the report submitted in January 1900, 1,500,000 seedlings were reported in the nursery at Axton, and in the report submitted in January, 1902, the number of seedlings in stock in both nurseries was given as 1,250,000.

#### *Ten Dollars per Acre*

Plantations were made in 1901 and 1902, on a total of 225 acres, partly on the cut over areas and partly on old fields and burns, 232,000 trees, two and three year old seedlings, being used for the purpose. The cost of planting, including cost of stock, was about \$10 per acre. The species used were white pine, Douglas fir and Norway spruce, with lesser quantities of Scotch pine, Riga pine, European larch, red pine and white spruce.

A visit made to these plantations in 1906 showed the young trees hardly visible among the undergrowth of ferns and other vegetation, the whole experiment abandoned and the plantations left to take care of themselves owing to opposition, powerful in political circles, from people who objected to any timber operations in the district at all, and who finally secured the veto of the appropriation for the Forest School.

The plantations, though without care and in spite of some damage from fire, have remained, and an opportunity of visiting them during the present year allowed of some comparisons and an appreciation of the development of the plantations. Unfortunately from some points of view, the visit was made alone and therefore unaccompanied by anybody who had been connected with the experiment and who could have made the visit more instructive. On the other hand, the conclusions reached are unbiassed from the absence of such a mentor.



Sixteen Year Old Scotch Pine, Axton, Adirondacks.

#### *Fine Height Growth*

A plantation of white pine, Scotch pine and Norway spruce, westward of the headquarters at Axton, was found to be growing vigorously, the pine trees reaching eighteen to twenty feet in height and making rapid height growth. The Scotch pine had made the most robust growth but the white was healthy and adding rapidly to its height. While the spruce generally lagged behind it was not unhealthy and in some cases its height growth rivalled that of the pines. Nearer the headquarters even finer specimens of planted white pine were found associated with some evidently of older growth. To the east a plantation of Scotch pine, which had evidently been set out on an old field and is an outstanding feature of the landscape, was visited and showed

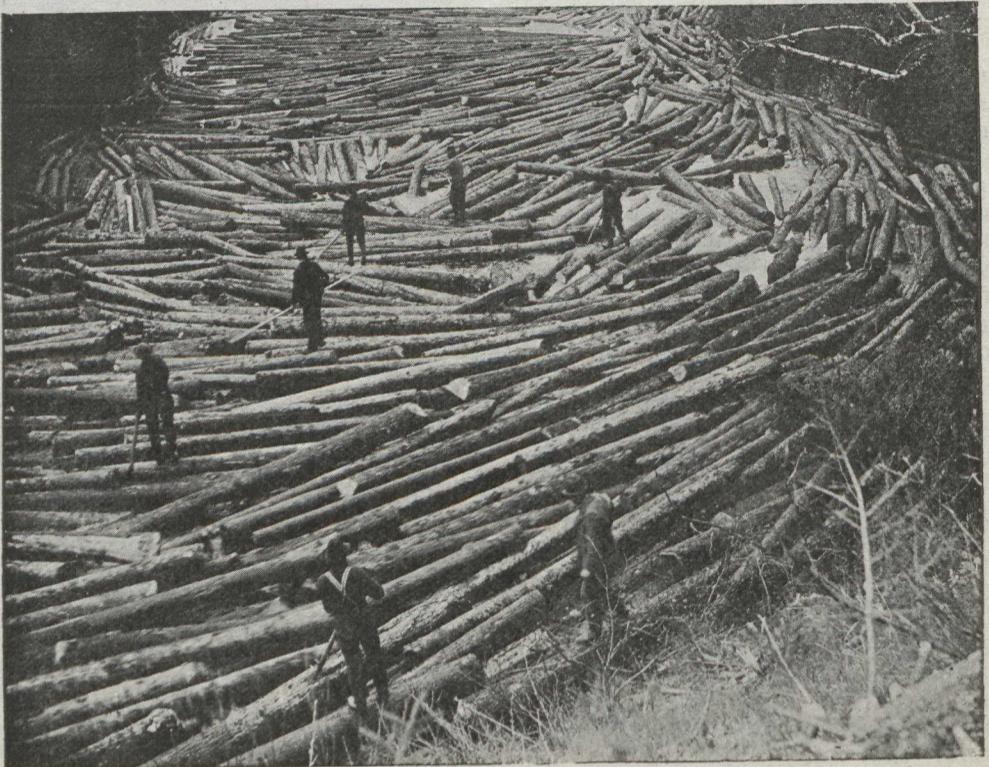
the same evidence of vigor, rapidly becoming a dense forest.

#### *A Pronounced Success*

In the Wawbeek Division near Axton a plantation of white pine, Scotch pine and Norway spruce made on cut over lands was seen and formed a marked contrast to the unplanted lands in the vicinity. Finally a plantation of Scotch pine made on burned over lands was examined. It formed a dense young forest, almost impenetrable, and, though small in area, should in time furnish a splendid stand of timber. Farther along the road the results of letting a fire run into this young growth were seen and formed a most unpleasing contrast. While the plantations show lack of care in some respects the general impression left is that they are a pronounced success and should have been carried to completion.

While a less hasty visit and with someone fully acquainted with the original experiment would have brought out fuller and more exact information, yet it is thought that even this slight sketch of the situation is a fair summary of its general aspect. One striking feature was the unanimity of opinion in the district, so far as it was met, that the abandonment of the work was a serious mistake.

Stock from the forest school nursery was supplied to the State Commission in 1902 for planting on state lands and stock remaining in the nurseries was used for similar purposes later, and if the initiation of the active and successful nursery and plantations established by the state is due in any degree to the Forest School experiment it is surely justified by its children.



A Glimpse of the Annual Log Harvest that Pays into New Brunswick's Treasury Over Half a Million Dollars a Year



Hauling Out Logs on a New Brunswick Timber Limit

## Nova Scotia's Forest Position

BY F. C. WHITMAN

ANNAPOLIS ROYAL, FORMERLY PRESIDENT, CANADIAN FORESTRY ASSOC.

### Deteriorating Source of Wood Supplies Runs Up Production of Fishing and Farming Costs.

In the early "nineties" and up to 1904 the forest fire laws were not enforced in Nova Scotia, and during this time Nova Scotia experienced very disastrous forest fires, than in a single County swept over 40,000 acres. Fires in the Province scorched thousands of acres of woodland and its effect is plainly marked to-day. It will take years for this land to come back again to a producing condition. I am pleased to say that it is coming back and what was a short time ago a blackened territory is now green again with the natural production of forest trees. In the County mentioned reckoning the 40,-

000 acres at the low estimate of 500 feet of lumber to the acre, it means a loss of twenty millions of feet that would have cut a million feet annually and have made a distribution of ten thousand dollars a year in wages. It will take forty years at the very least before this burnt over land can be expected to give a reasonable cut of wood.

These fires awakened the public to the necessity of putting the fire laws in force, and the Government on being urged, passed an Act in 1904 for the Protection of Woods Against Fires, and with amendments this Act is now in force in most of the Coun-

ties that have forest land. In 1913 the Act was amended and consolidated and is now entitled the *Forestry Protection Act*.

#### *A Good Fire Law*

It has met with a most favourable reception by our own people and has been strongly commended by leading Forestry Authorities in Canada and the United States.

In practical working it demonstrates that fires can be prevented or if started can be stopped. If there is any County in the Province that has land more suitable for growing wood and timber than for any other purpose it should come in under this Act and take advantage of it to protect the growing trees and increase a needed supply of wood. Let me say that the City of Halifax should be interested. They have a beautiful spot on the North West Arm, much of that beauty is in the environment, and if forest fires are allowed to creep in as they have been doing in the past few years it will surely spoil the appearance of the Arm and be a disgrace to the City of Halifax. That is not putting it too strongly for a little co-operation between the City authorities and the County would put a stop to the almost annual burnings.

#### *Deterioration Set-in*

To many, Forestry and Conservation seems to mean a stop to the production of lumber; but lumber under forestry methods leads to a greater production and the assurance of a future supply.

What has stopped the larger output of lumber has been fires, and over-cutting. Cutting down the trees faster than the annual growth, and natural reproduction can fill up the gap. Where fires have been severe, or where there has been more than one burn over the same piece of land, it takes from forty to sixty years to reproduce commercial lumber.

In Nova Scotia we started at the top of the ladder and came down and we have now to start almost at the foot of the ladder and climb. That is to say, in lumbering the virgin timber

and the older growth has been disposed of, and year by year the quality and average of cargoes of export lumber has steadily deteriorated. Nova Scotia is at a point where it is absolutely necessary in the first place to prevent forest fires; and in the second place to be more conservative in the cut of lumber and to let the trees grow.

#### *Few Seed Trees Left*

Pine lands will reproduce pine if a sufficient number of seed trees are left standing; unfortunately this has seldom been the case in Nova Scotia. It is the same with spruce, the next wood in value, and the more profitable and quicker to reproduce. The least valuable is the hardwoods and these seed more readily than any other kind. The seeds are small and plentiful, there is an annual crop that spreads readily by the wind and is carried for miles in the Winter on the snow. This seed finds a quick lodgement in cut over or burnt lands and accounts for its rapid reproduction as compared with pine or spruce.

A few years ago the Provincial Government completed a Forest Survey of Nova Scotia. Accompanying the report is a detail map of the whole Province and more particularly the forest areas. It shows in colour the burnt land and the barrens, the stands and growth of pine, spruce, hemlock, hardwood and mixed growth. When making this survey the Government maps or plans were corrected and consolidated as near as it was possible to do so, for the early forest surveys and land locations have not been at all accurate.

#### *The Forests Coming Back*

It is said of Nova Scotia that artificial planting or seeding is not needed, and that natural reproduction is all that is necessary to give a continuous growth, provided forest fires are stopped.

The Forest Survey of Nova Scotia is a starting point, and at any time comparisons can be made to see if we are progressing or retrograding. It is my opinion under the admirable working of the present fire laws that

Nova Scotia in its stand of timber and extensive new growth of all kinds of wood is progressing.

It would be impossible in this paper to take up all lines of reproduction and use of Nova Scotia's forest woods. I will therefore take it up as follows:

#### *Cooperage Doubles in Price*

Outside of the bigger interests in Lumber production, I think the matter of Cooperage and the pressing need of an annual supply of barrels, fish packages, and boxes will appeal strongly to the farmer, fishman and manufacturer. For many years dependence has been placed on the saw mills for a supply of side boards, and log ends to be cut into heads and staves. This supply has fallen off and the price of material advanced to twice the former cost. In hoops the supply has been uncertain for several years past, and notwithstanding the importation of cooperage and hoops from New Brunswick, Ontario and abroad, the cost of a barrel has increased and is likely to be more difficult to obtain and more costly in the future.

#### *Woodlots vs. Dear Coal*

Nearly every farm in the Annapolis Valley has a woodlot and with proper looking after it can be a source of profit in producing wood for farm use and for cooperage.

The pinch in coal this year makes a generous woodpile at the door yard look a pretty good thing to have. The wood pile is of more importance, more consumers need it, and its value has increased. Speaking personally I find the measurement has decreased. For stave wood spruce is the best. It only requires a small sized tree and now is the time to consider whether it would not be good planning to let the woodlot produce stave wood. A thinning out of too thick a growth, trimming off the low branches, letting in the light and air, will quicken the growth and turn a wood lot thicket into a producer of good wood.

#### *Cheaper Hoops from France*

Just before the war a buyer of hoops could not be supplied in Nova

Scotia, and on inquiry found that the hoops required could be imported from France at a price delivered in Halifax the same as usually paid for this kind of hoop produced in New Brunswick and Nova Scotia.

The French grow the hoop poles as a crop. They have acreage in hoop pole trees that are systematically cut every year, and are thus able not only to supply their own wants, but also able to export them to other countries. Anyone would imagine on looking over districts in this Province where young birch trees are growing, that the supply of hoop poles was unlimited. The man who cuts them will tell you that perhaps one hundred trees out of a thousand are suitable, whilst the rest are either too small, or too large for practical working, or waste wood owing to defects and decay. On the other hand if a tract of young birch was looked after, culled when growing, a first cut of poles made when the bigger trees reached the proper size, the tract could be put in such shape that it would produce an annual crop with economy in time and labour and natural reproduction would fill in the cuttings.

It must be apparent to any one that such a tract of land would have a cash value far greater than ordinary wild land.

#### *The Prop of Permanence*

Since writing the above I have read the following article in a paper on Present and Possible Products from Canadian Woods, by John S. Bates A.M. Canadian Society of Civil Engineers.

"There are several general conditions which should be kept in mind by every Canadian. Canada is considered to be the third country of the world in value of Forest Resources. Russia first and United States second in the list. Contrary to public impression forest surveys indicate that Canada's present supply of merchantable timber is only one fifth or one quarter of the supply still available in the United States.

"There is real necessity for the

extension of adequate protection of our present forests, wise utilization of the timber when it is cut and foresight in planning for natural and artificial reproductions. Trees are

becoming to be regarded more and more as a forest crop, and with proper system there is no reason why our forests should not be a source of expanding and permanent wealth.

## Over 7,000,000 Trees Planted on Prairies

On the farms of the prairies of the three provinces during the season of 1917, 7,450,000 trees have been planted by the joint co-operation of the forestry department and the farmers with the three-fold object in view of providing the farmsteads with shelter belts, the farmer with a possible future supply of wood, and of adding pleasing effect by beautifying the landscape of the prairie homeland. Incidentally, trees are said to have an important effect on the weather and climate, as well as in the supply of moisture. Certainly they tend to check the winds and by catching the drifting snow, they may be used to increase the supply of moisture in the soil of field or garden, an end much desired in certain sections of the prairie west.

The deciduous trees are of five kinds, maple, ash, Russian poplar, caraganna, red willow and aspen leaf willow. The evergreen trees include white spruce, lodge pole pine, jack pine and Scotch pine. The deciduous trees are supplied free by the forestry department, and the nominal charge of a cent each is charged for the evergreens. The express from Indian Head, Sask., is paid by the applicant in each case.

### *Inspectors Tour Country*

In order to supervise the work and to see that the ground is properly prepared in advance by summer-fallowing, and to see that the trees are properly cared for after they are planted, nine government inspectors are kept busy during the summer season visiting the plantations and inspecting the preparations made by applicants.

On one of these inspection trips Inspector J. Cowie visited the Edmonton district a few days ago. His

inspectorate extends from the International boundary to as far north of Edmonton as there are likely to be applicants for trees, from the Saskatchewan boundary to the tree clad slopes of the Rock mountains. The territory is so large that a large slice to the north-east of the Red Deer river has been placed in another inspectorate, covered by an inspector who also visits northern Saskatchewan.

In 1916 Inspector Cowie dealt with 1,327 applications and plantations, and in 1,130 there was a decrease to 1,130 locations. The decrease is due to the scarcity of labor since the war, causing the farmers to have less time to prepare ground for planting trees.

### *80 per cent. Turn Out Well*

About eighty per cent. of the trees planted have turned out well, and where there has been failure it has been largely due to uninterested tenants on rented farms, the enlistment of farmers, and the selling or abandonment of farms. Only about five per cent. of the failures were due to gross carelessness. The most successful trees proved to be Russian poplar and caraganna, and among the evergreens the white spruce has proved to be the most adaptable to Alberta. The pines are best suited to rocky districts.

Some farmers on the prairie have found that the double shelter belt has enabled them to grow small fruits most successfully. The outer belt of trees catches the drifting snow, and the garden of berry patch is planted in the treeless land between the inner and the outer shelter belt. The farm yard is often located inside the inner belt, where the family and live stock are quite comfortably located, even on

the prairie which was once noted for its blizzards. In the districts near Edmonton this would not apply as much as it does to those settlements where there are no trees except those planted by the settler. In many districts to the north and west of Edmonton the trouble of the pioneer homesteader was to get rid of the natural growth of trees. But now that the native brush is being cleared off, the settlers of the Edmonton district are frequently turning their attention to the planting of shelter belts around their farm buildings. With the satisfactory supply of moisture found here, there is little or no difficulty found in growing these trees.

#### *Another Plantation Started*

The forestry department have on their farm at Indian Head a plantation of 480 acres devoted to the cultivation of trees and demonstration plots. Owing to the increase of applications in recent years, and to supply the demands of a large area, another plantation of 320 acres has been started at Sutherland, Saskatchewan, and sown with seed that will in due time produce a crop of trees. These tree plantations are under the supervision of Norman Ross, chief of the Tree Planting division of the Forestry Department, with headquarters at Indian Head. To him all applications for trees should be made.

The trees are supplied for planting on the farms only, and must not be planted in towns or cities. Those wishing to plant trees in 1919 must have their applications in before March, 1918. The ground on which the trees are to be planted must be summer-fallowed the year previous to planting, and a satisfactory report is received by the department from their own inspector before the trees are sent out.

#### THE PRESS IN CANADA

There are 1381 publications of all kinds now being issued in Canada, including 138 dailies, 4 tri-weeklies, 4 semi-weeklies, 921 weeklies, 222 monthlies, 1 bi-monthly, and 16 quarterlies.

#### A WOODLOT'S FINE RECORD

*(By the Editor of the "Weekly Sun" Toronto)*

After a somewhat strenuous day in picking plums and tomatoes, I took a stroll in the early afternoon out to the plantation of young pines at the rear of the farm. This was the first time I had seen the trees at close range since last spring, and I was simply amazed at their growth since planting, and particularly during the past summer. The trees, no bigger than young tomato plants when set out five years ago, now have an average height of around six feet, many of them being eight feet or better. They were planted about four or five feet apart, and practically all the ground occupied is now shaded by a vigorous growth. In some places the limbs are so intertwined that it is a matter of difficulty to force one's way between the rows. So few of the trees died at the start that the loss is hardly noticeable, and I did not find more than three weak ones among the thousands that remain. The plantation covers a three-cornered hillside at one end of the farm, and is protected by line fences on two sides and a wire fence, separating the woodlot from a permanent pasture, on the third side. There is no part of the place which gives greater satisfaction than the woodlot on the hill, with the silver stream winding through the always green pasture below.

#### FORESTRY PROFESSOR IN FRANCE

Prof. W. N. Millar, recently of the Faculty of Forestry, Toronto University, is now in France as Captain of Company A, 10th Engineers. His company is engaged in preparing materials for docks, warehouses, railroads and cantonments for the American troops and the order calls for 140,000,000 feet B. M. of materials of all kinds.

The smallest type of mill to be used will be capable of cutting 5,000 to 6,000 feet. It is claimed that these little shavers can be set in ten minutes and changed in twenty minutes. They will follow the cutting.

## "Manitoba a Forest Province"

Manitoba, a province naturally well endowed with extensive forests in its northern sections where farming will never play a large part, shows a total revenue of \$12,000 yearly for the Dominion Forestry Branch, as against \$100,000 spent by the Branch on the necessary work of fire protection, and improvements.

Sweden takes for the public treasury from its forests \$5,000,000 gross revenue a year, \$3,000,000 of which is net revenue.

As to the analogy between conditions in Manitoba and Sweden, we reproduce the following from "Manitoba, A Forest Province," by R. H. Campbell, Director of Forestry:—

"Sweden has probably the advantage of Manitoba in having better drainage in some of the northern areas and in having a more extended sea coast, with quicker and cheaper access to long established markets, but I cannot see that other conditions exist that give Sweden an advantage over Manitoba if the forest areas were in as good condition. This they are not at present, nor will they be for a long time to come, and it will require a large expenditure on protection and improvements without regard to revenue during that time, to bring the forests into good condition and to produce a revenue that will more than offset the expenditure. Under the administration of the federal government the forests have been allowed to get into such an unsatisfactory condition and the federal government should make the necessary expenditure from its large revenues to place such a great natural resource, and so important to the prosperity of the province and of the whole country, in a condition of permanent security and producing power so that it may regularly and continuously produce a revenue for the State and the raw material for industries.

## Forest Nursery Plans Great Extensions

During the past year, more than 500,000 forest tree seedlings have been shipped from the Quebec forest nursery at Berthierville, P.Q. The provincial forester, G. C. Piche, reports that of these, nearly 200,000 were white pine, 180,000 Norway spruce, 82,000 Scotch pine, 20,000 Douglas fir, 8,000 red pine, 7,000 white spruce, and 6,000 tamarack, the balance being made up of relatively small numbers of other species, mostly hardwoods, to supply the demands of farmers. The great bulk of the demand was, however, for the reforestation of burned-over non-agricultural lands. The Laurentide Company, Limited, and the Riordan Pulp and Paper Co. were heavy purchasers of plant material from the

provincial nursery, in addition to supplies secured from their own nurseries. The Perthuis seignior also has purchased a large number of small trees from Berthierville annually during the past seven years.

To date, the provincial nursery has shipped a total of more than 1,500,000 trees since its inception; of these, more than half have been supplied during the past two years. The demand for planting stock has become so insistent that the provincial forester announces the proposed extension of the capacity of the Berthierville nursery to 3,000,000 seedlings annually. Of these, the majority will be Norway spruce, which is believed to be the most suitable for pulpwood production.—C. L. in "Conservation."

# The Story of Canada's Forests

BY THE SECRETARY,  
CANADIAN FORESTRY ASSOCIATION

**From English Conquest to the Great War  
the Forest has proved a mighty possession**

(Article published also in Confederation Number of Toronto "Mail and Empire")

**T**HE lumbering industry is probably our most widely distributed manufacturing enterprise. It is also one of the oldest, ranking with the fur trade, and the first attempts at extensive settlement. Since Confederation, and before it, it has retained more than most industries the conservative traditions of independent organization and manufacturing methods.

In numbers of plants, in wider location of woods operations and selling agencies, the growth has been, of course, enormous; but as relates to any mechanical or marketing evolution, a blue print of a group of 1917 saw mills would differ chiefly in bulk from the manufacturing scheme of 1867. There have been refinements, a closing out of the amazing waste at the mill end, a speeding up of processes; but the conservatism of lumbering as compared with the making of shoes, the manufacture of foods, the fabrication of steel, is striking and distinctive. Science and invention and market developments have to a great degree spared lumbering from the upsetting changes that have scrapped the machinery and methods of other undertakings in five and ten year periods.

## *Lumbering Has Developed Canada*

For all that, Canada owes to the lumbering industry an almost incalculable share of her national development. From first to last, the lumberman has been a great employer—an indispensable source of winter revenue to the early settlers, a magnet for foreign capital, a lavish distributor of wealth extracted from a natural resource. To-day, touching only the bald statistics of the thing, the wood-

using industries of all classes employ more capital, pay more wages, and employ more men than any other industry except Agriculture.

It is an interesting fact that whatever other natural resources we may consider, whatever commercial activity may be under discussion, the necessity for a wood supply enters at one or another stage. The Canadian Pacific Railway, for example, needs annually 5,000,000 track ties, 50,000 telegraph poles and 60,000,000 feet of lumber to operate the system. The coal mines of Nova Scotia or Alberta are dependent upon pit props in great abundance, for it takes six lineal feet of wood for each ton of coal produced. The fisheries require wooden boats, boxes and barrels. The farmer is helpless to extract a dollar from the most fertile land without the accessories of a wooden home and barn, wooden fence posts and fuel, wagons, implements, churns, and a hundred other products of the tree. Practically no other activity from a daily newspaper to an Arctic whaling fleet can carry on without the aid of manufactured wood.

In the light of the present enormous development of wood-using plants—attaining nearly \$200,000,000 worth of products a year—it is not the least interesting part of the story to find how in the days of our French and English forefathers the public policies towards the mighty forests manifested barely a trace of prophetic vision. None apparently reckoned upon a day when more than 5000 busy plants lying in a winding chain across the Dominion would look to the forest for their raw materials or when 110,000 men would get their living from the 'fabricating' of trees.

### *The Beginnings of Lumbering in Canada*

Opening a page of Canadian historical records at 1683 we come upon seigniorial grants conditioned upon 'the preservation of oak timber for the building of vessels.' Pine and other woods were merely occupying good room. Only the necessities of the Royal Navy caused any reference to the value of a forest in the deeds or land policies of that time. Likewise in 1713, 1747, and other years, we find the French Governors reserving areas for oak timber for ship and bridge building. Down to the close of the French regime no industry had evolved from the forest resources except as applied to labor in getting out naval timbers.

From the time of the occupation of the British in 1763, new demands arose. White pines adapted to naval masting and accessible for water carriage were expressly reserved for use by the Home Government. Thirty-four years afterwards licenses were issued to contractors for the Royal Naval Dockyards who in turn sublet the cutting and export rights to merchants and lumbermen in Canada. Therein was provided the first substantial impetus towards extensive exploitation of the forest. The privileges of our present licenses may sometimes seem elastic enough, but what would be said to-day to a timber license, granted in 1808, by the naval authorities, to "travel into and search our woods in our provinces of lower and Upper Canada where we have reserved to us the property in any woods or trees and the right of cutting them, and there to fell and cut so many good and sound trees as may answer the number and dimensions of said contract." A license giving one firm the pick of probably 350,000,000 acres of merchantable timber!

The remoteness of Canada's timber from the European user and the small capacity of ocean carriers was not the worst handicap in our lumber development, for a strange prejudice against Canadian woods had gained hold in the British market. Giving

evidence before a British Parliamentary commission in 1820, Alexander Copland, a timber merchant and builder stated that "Norway, Swedish, Russian, and Prussian timber is very superior quality to that imported from America. The bulk of that is very inferior in quality, much softer in its nature, not so durable, and very liable to dry rot. Indeed, it is not allowed by a professional man under Government to be used, nor is it ever used in the best buildings of London." This sort of buncombe was bound to dissolve before common sense experience, and, indeed, it shortly came that few buyers discriminated against Canadian woods in matter of quality.

The export timber trade of Canada mounted until in 1825 from the one province of New Brunswick, 400,000 tons of white pine went overseas. During and after the Napoleonic wars, partly because of the disorganization of Baltic trade, and as much from the desire to encourage Colonial commerce and help pay the battle bill, the timber trade between Canada and the United Kingdom grew until Britain, ninety-seven years ago, imported 335,556 loads (a load equal to 50 cubic feet) of timber from British North America, and 166,600 from European countries. This was a most advantageous change from 17 years earlier when only 12,133 loads were provided by Canada, and 280,550 loads from European countries. In the year of Confederation, 1867, Canada had so promoted its lumber industry as to sell to the United Kingdom \$6,889,000 worth, and to the United States a bill just nine thousand dollars smaller.

### *Canada's White Pine*

As was noted at the beginning of the article, the changes in the lumber industry of Canada since Confederation have been chiefly in respect of extension of volume rather than of evolution of manufacturing methods. It is true that narrowly that period occurred the apotheosis of the square timber trade. Means of quick economical transport by rail have also wonderfully advanced.

More significant, however, has been the striking change in timber values, due to the gradual depletion of once abundant tree species and the growth of population and markets. White pine, so prolifically distributed through Ontario, Quebec and New Brunswick—then, as now intrinsically the most valuable wood we have—has been reduced to rather a poor second to spruce and Douglas fir in the total national cut. It is not to be gainsaid that a great deal more white pine has been delivered to fire than has been turned to commercial purpose. Indeed, the estimate of investigators is that two-thirds of the country's original forest inheritance has been the victim of flames. White pine in New Brunswick does not take better than fifth place in the average season's cut. The words of a Quebec lumberman testify to a like condition farther west. "A boom at my father's mill was practically all white pine, and about five or ten per cent. spruce. To-day the proportions have been reversed." Ontario alone maintains its white pine preponderance year by year.

Our most valuable hardwoods also have suffered. Standing as they did on the agricultural soils of southern Quebec and Ontario, the advance of settlement took small account of future market prices for oak, elm, or walnut. We are, as a consequence, importing most of our precious hardwoods to-day from the United States, and the college building or residence of recent construction will as often as not exhibit oak panelling supplied from Uncle Sam's forests.

Hemlock, too, has supplied another lesson on the necessity of guarding resources for future values. Hemlock in Canada had for long years a trifling value as a source of tan bark. As might be expected, the hemlock supplies of the country went the prodigal way of white pine until now operators are offering prices that a few years ago would have seemed quixotic.

Spruce has become king of the castle. Spruce, white pine, and Douglas fir account for 75 per cent. of the

total annual cut, which in 1915 ran to  $3\frac{1}{4}$  billion feet, board measure, worth \$61,919,806. Hardwoods represented only about 6 per cent. Over 3 billion shingles are produced yearly, worth about \$6,000,000.

#### *Forest Wealth by Provinces*

Just as the most important fact in the nickel industry of Canada is the extent of nickel deposits, similarly the lumber industry must be viewed in the light of the living forests. Canada's timber resources are the third largest in the world, ranking after those of Russia and the United States. The estimated present supply of commercial timber, according to the Dominion Director of Forestry, is 500 to 800 billion feet, not an 'inexhaustible' quantity when we consider that we are using three and a quarter billion feet a year, and with the population of 1950 will probably multiply the annual consumption several times. The area of 'commercial forest' (not including pulp wood, fire wood, etc., is) reckoned at about 250,000,000 acres, or one half the whole forested area of the Dominion.

British Columbia, with 50 million acres, containing 350 billion feet, board measure, has more large saw timber than any other province. Douglas fir accounted in 1915 for more than two-thirds of the total lumber cut of the province, with red cedar, spruce, yellow pine, larch, etc., varying from 8 per cent. downward. The bulk of the best timber is in the Coast region.

Alberta has about 5,400,000 acres of commercial saw timber amounting to 21 billion board feet, spruce forming the bulk of the annual cut. Saskatchewan timber area is 3,584,000 acres, the contents of which are about 14 billion feet, spruce being the prevalent commercial wood. In Manitoba 1,920,000 acres of saw timber contain about 6,850,000 feet of timber, and of the annual cut of lumber in 1915, spruce formed 93 per cent.

Ontario, accessible to the richest markets of the continent and endowed with excellent transportation facilities from the log to the finished

product, placed a value of about \$21,000,000 yearly upon its lumber, lath and shingle production in 1915. Its productive forest areas are from 70 to 90 millions of acres containing approximately 150 billion feet of merchantable timber. White pine, spruce, red pine, jack pine, balsam, fir, tamarack, hemlock, white cedar and hardwoods are present, for the greater part in abundance. In 1915 white pine formed 60 per cent. of the timber cut, hemlock over 10 per cent., red pine 10 per cent. spruce 8 per cent., maple, elm, and twenty other species the remaining 12 per cent.

Quebec contains about 80 to 100 million acres of merchantable saw timber, the coniferous species being about the same as in Ontario. The value of the 1915 lumber, lath and shingle production was \$19,196,000. Estimates place Quebec's saw timber at about 160 billion feet. Quebec's white pine represents 15 per cent. of the total cut against Ontario's 60 per cent. while spruce in Ontario was but 8 per cent. of the total cut as against 55 per cent. in Quebec. The claim is sometimes made that the two provinces have approximately the same values in white pine, although statistical proof is largely lacking.

New Brunswick's forest area is a little over 12,000,000 acres with standing timber of about 22 billion feet, spruce being the wood of greatest utilization. Nova Scotia has about 10 billion feet of timber covering more than 5,700,000 acres, the tree species differing little from those of New Brunswick.

#### *Canada's Future as a Producer of Wood*

As to the future of the lumber industry in Canada, few can doubt that with better trade organization, with aggressive sales methods to meet the increasing inroads of wood substitutes, and the searching out and cultivating of markets—with these elements of efficiency and balance more fully developed, the lumber industry will have an open road to great expansion and prosperity. To particularize on such an experience

as that of British Columbia lumber trade during the past three years merely re-states the need for better trade organization, and adequate transportation facilities to take care not only of foreign export orders, but the demands from the prairies as well. Similar remedies are called for in the East as in British Columbia.

While export orders of British Columbia timbers to Australia, New Zealand and South Africa have been steadily mounting, the evidence of H. R. MacMillan, former Timber Trade Commissioner for Canada, who recently visited the Antipodes, is that so firmly established in public favor are timber from the Baltic states and from the United States that Canada must exert prodigious effort to take her place as a serious competitor, although the war has opened the door for valued introductions. At present, British Columbia woods are practically unknown by name in many of the markets and sometimes grossly underestimated as to quality and adaptability.

#### *What Canada Expects*

In total exports of sawn lumber, the country now ranks well up to fourth place in the list of all nations. We send beyond our borders about forty-three million dollars worth a year. About \$10,000,000 of that amount goes yearly to the United Kingdom. Exports of wood in all its forms of manufacture (including pulp and paper) were valued at \$62,000,000 for the year ending March 31st, 1916. While many lumbermen anticipate a great demand for lumber from the United Kingdom, France, and Belgium after the war, the comparative distances of Baltic and Canadian sources of wood supply have tempered the expectations of others, for the average freight rate from Baltic ports to England is 1½d. as against 4d. from Canadian ports.

The United States lumberman is, to an unrecognized degree, the arbiter of the Canadian price. One may study the barometer of United States lumber production and see at every occasion when production overtops home consumption, or when the mag-

net of Canadian demand shows extravim, the American mill hurries cargoes across the border. Canadian prices must meet the competition, and do. A quiet home demand in Canada and keen trade openings in the United States will, in turn, find the Canadian lumberman bidding in Uncle Sam's home towns. In this way the meeting line of Canadian and American competition swings from side to side of the international boundary. How this works out is seen in the United States sales to Canada of lumber and shingles amounting in 1915 to \$6,741,000 and reaching as high as \$14,328,000 in 1913. In the former year Canada sold to the States lumber and shingles valued at \$22,279,891. The total value of the Canadian lumber and shingle production in 1915 was \$69,750,000.

The growth of Canadian agricultural population and the opening up of new districts, building of new farms, homes, and towns, and the parallel development of manufacturing industries, will give a great and steady impetus to the lumber demand. We North Americans are the greatest wood users on earth, consuming six or seven times the amount per capita of the European. Our rapid expansion of 'plant' accounts only in part for this large discrepancy. Wood in all its forms is a world staple, the variety of uses for which are only now being unfolded by scientific experimentation. It is not too much to predict that within a very few years a wide commercial use will be found for practically every tree species found in Canada and that what is now termed a superfluity of poplar or jack pine, for example, will be counted in with the other rich assets of the timbered areas.

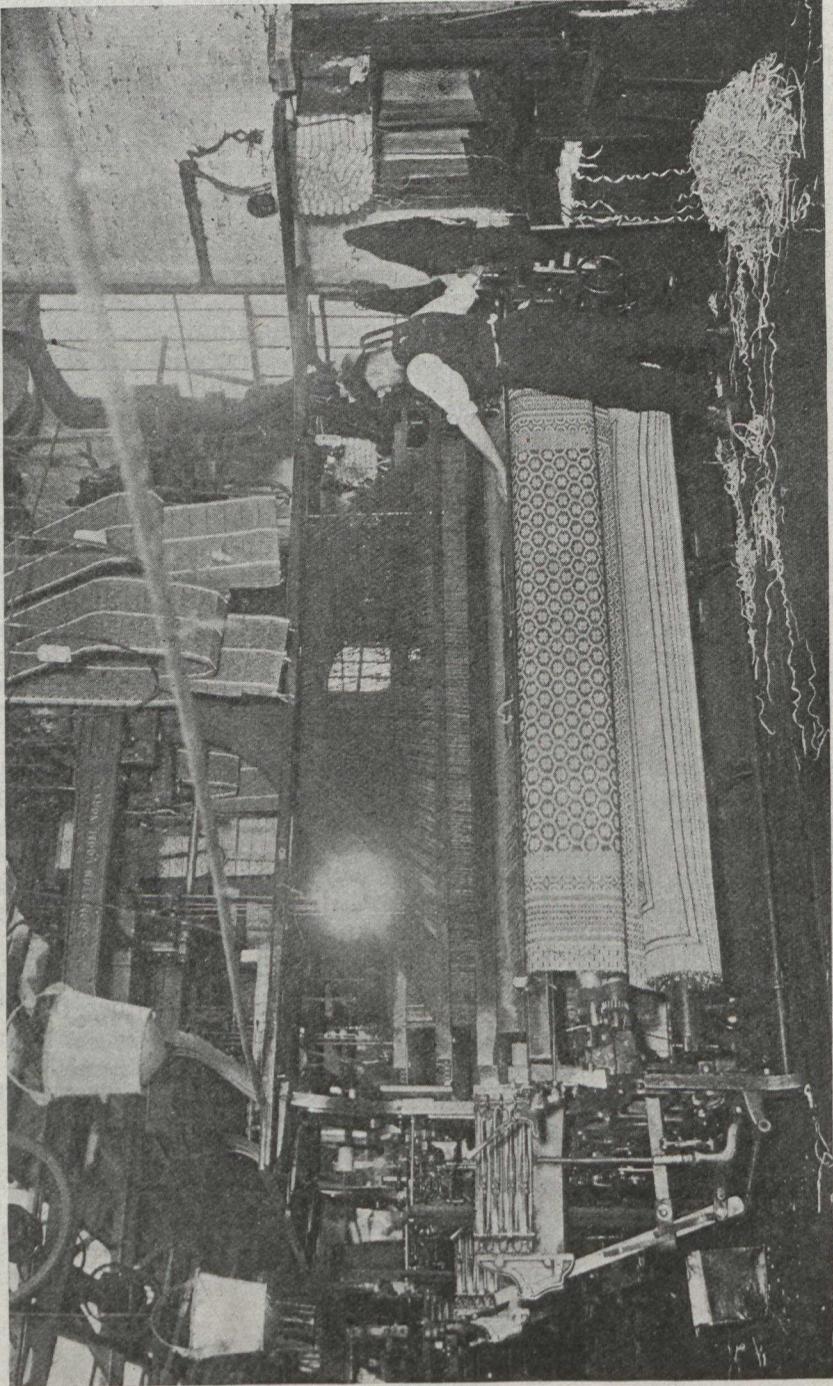
#### *Canada Has Been Careless*

There is no reason to doubt that

the present status of the lumber industry in Eastern Canada has been very materially affected by the country-wide neglect of forest preservation measures. Costs of getting out logs have risen steadily with the growing inaccessibility of the forest. That this distancing of the wood supply has been due first to forest fires, few lumbermen will dispute. That the methods of woods operations have not been such as to perpetuate tree growth of the more valuable species on lands cut over, is another factor equally applicable but not as commonly admitted. Economy and efficiency have tightened up the system at the mill end, while as a rule the methods at the woods end have not changed essentially in generations.

The more advanced lumbermen, and particularly pulp mill operators have long been cognizant of the deterioration of lumbered-over tracts, knowing well that if the lands on which the axe has fallen do not fully recuperate, as under present cutting methods they do not, every year brings the industry and the whole nation closer to timber exhaustion. This question of proper cutting regulations and rigid enforcement by the governments is sure to constitute one of the major issues to be reckoned with by wood-using industries in the near future.

The fact is entirely obvious that the hope of the lumber trade lies in a perpetual source of raw materials secured as cheaply as possible. Otherwise, Canada's hope of export trade in competition with those foreign nations enforcing scientific care of woodlands will be rendered vain, and the home market will to a greater degree be occupied by a less expensive array of building substitutes, as concrete, steel, and asbestos.



The loom, a special kind for the purpose, weaves the fibre thread into a durable rug of attractive design.

# Making Rugs From Paper Fibre

BY SYDNEY A. BONNAFFON IN "COMMERCIAL AMERICAN"

## How The Tree Is Turned To Paper Yarn, Then Woven Into Beautiful Designs.

As far back as history will take us the use of a floor covering of some sort has been characteristic of the human race. Even if it has been but the strewing of leaves or grass in cave habitations by the most ancient known representatives of mankind, this desire for comfort or protection underfoot has been a distinctive trait. But, while such carpeting may have been sufficient for the needs of the earliest cave dwellers, it was not long before the use of animal skins as an improvement over the more primitive means came into popularity. And even to the present day the animal skin is used extensively for this purpose, but among the highly civilized peoples the use is for decoration rather than for general utility.

In the days of ancient Greece and Rome the progress of civilization was reflected in a high appreciation of the decorative, and floorings of artificial stone, mosaics of marble, tile and variously colored woods symbolized the wealth and luxury of the times. It was in Rome that the famous textile carpets of Asia, the first recorded, those made by the Egyptians, and the woollen carpets of Babylon, found their sale, and for beauty and durability they have never been rivaled in all the centuries since. Oddly enough, the looms which made those wonderful carpets of antiquity differ in practically no respect from the Oriental hand-loom of to-day, which continue to supply the world's best and most expensive floor coverings.

### *The Carpet-making Art*

These Oriental rugs and carpets of Western Asia early found introduction into European countries. The Moors brought them to Spain during

their conquests in that country. Again, the Crusaders to the Holy Land brought them home with them. Italy, because of its proximity to the rug markets, had Oriental rugs long ahead of other modern countries. Before the advent of the textile carpet in Europe tapestries and needlework hangings were occasionally used as carpets, but it was not until the fourteenth century, and in Flanders, that carpet making really had its start. From then on the development of the industry spread rapidly, although the influence of the Oriental article, particularly in the matter of design and colors, was strong, and has continued so up to the present day.

Rugs and carpets, however, despite the modern improved methods of machine weaving and large scale production, have never become what might be termed cheap. Where low price has been desired, quality and consequently utility have had to be sacrificed. Little more than a hundred years ago American housewives considered even the modest home-made rag carpets as a luxury and only to be used in the best room of the house, while in other rooms the floor was left bare, or, as in the much-tenanted kitchen and sitting room, sand was used. Now, however, the living standard has risen, and with it a demand for an attractive as well as a durable and cheap floor covering. In recent years Japanese and Chinese mattings have come to be used as a cheap substitute for carpet. It is not, however, a cheerful winter floor covering, nor can it be considered at all attractive, rather the contrary. Similarly, cocoa matting, made from the fibrous husk of the cocoanut, while durable, is rather a coarse and harsh

floor covering and not popular for inside use. Various other vegetable fibres have been employed in making carpeting, but the product is usually found to be wanting in some respect as far as general use is concerned.

#### *The Start of Paper Weaving*

Appreciating the widespread need, not only in the United States, but all over the world, for a low-priced carpeting which would be attractive yet durable, William Scholes, a Philadelphian, hit upon the idea of weaving rugs and carpets of paper. After considerable experimenting lasting over several years, Scholes succeeded in perfecting his idea, an all-paper rug, made from strips of tissue paper of various colors, twisted into thread and woven into a compact, heavy mat or fabric. When used as a floor covering this rug was found to be not only attractive in design but durable as well, and very cheap, selling for a half to third the price of ordinary wool carpeting.

Upon further experimentation it was found that the addition of a little wool brightened up the rug, giving it a rich appearance and also making it easier to sweep. Consequently, the manufacture of both kinds of rugs, the so-called paper-fibre rug and the wool and paper-fibre rug, was taken up, and for a number of years the market has been supplied with them. The fact that the manufacture of this interesting kind of carpeting dates back only a few years, however, explains why many have not as yet become acquainted with the product, although it has made its way to the front rapidly, and in the face of competition by many different floor coverings.

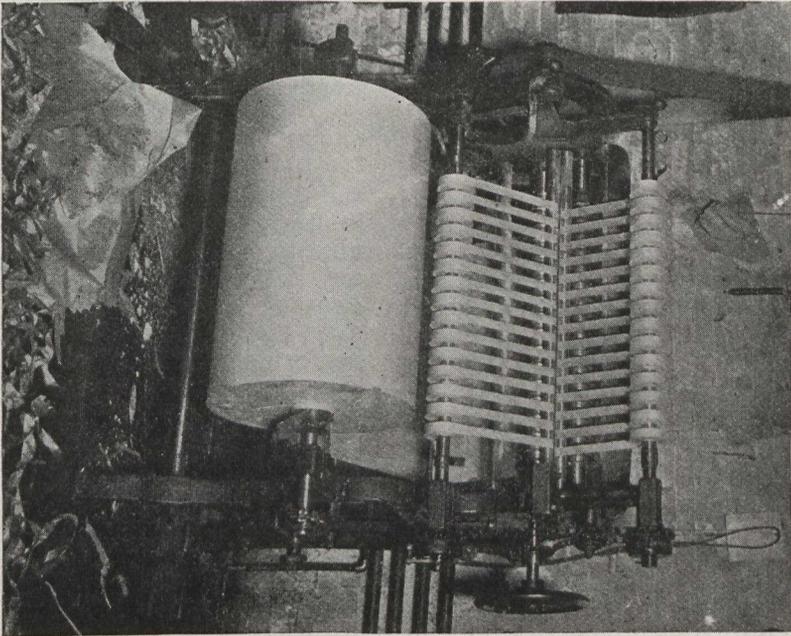
#### *How the Process Works*

The simplicity of the process of manufacturing the paper-fibre rug has almost as much to do with the low price at which it can be sold as the cheapness of the material of which it is made. For this reason the methods involved in the process of manufacture are interesting. The paper from which the fibre of the rug is

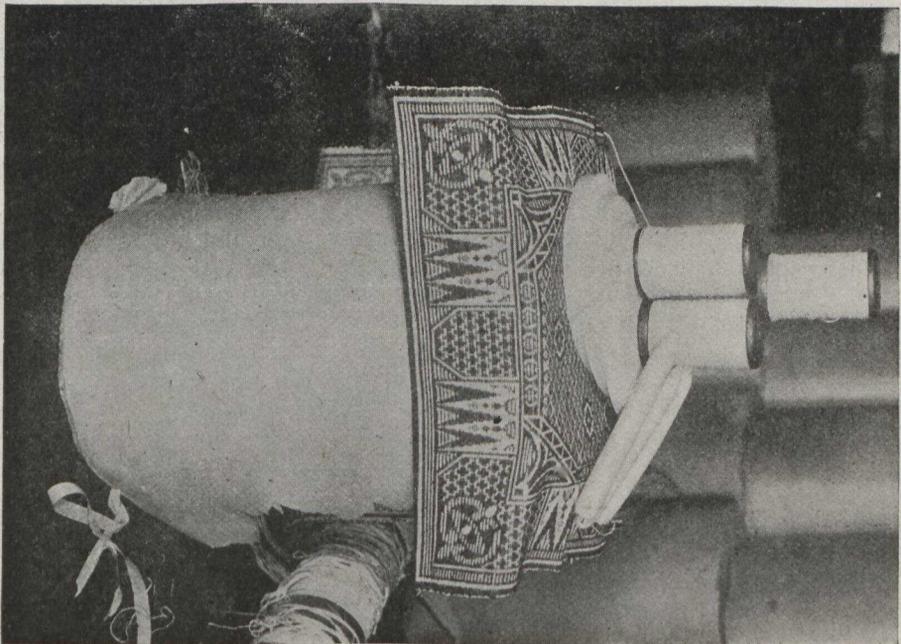
to be made is first dyed while it is still in pulp form. The paper makers furnish great jumbo rolls of paper in the colors desired. These rolls of paper measure from two to five feet in length, and weigh as much as seven hundred pounds to the roll. The first step in preparing the paper for rug making is to cut it into strips suitable for twisting into a thread or fibre. This is done on what is called a slitting machine. One large roll of paper will be cut up into thirty or so long strips of widths varying according to the size thread desired—narrow strips for light-weight goods, wider for the heavy. The same machine which slits the paper also rolls it up again, so that a large jumbo roll several feet wide will be cut up into inch or half-inch widths and re-rolled, but of the same thickness as the original roll. This done, the paper is ready to go through the dampening process, and is stored away in a humidifying room.

When the paper has been in this room three or four days it is ready to go to the spinning frames. Another humidifier here assures the proper action of the paper during the spinning. As the strips of paper unroll they go through a twisting process and are then rewound upon large spools. The paper is now in the form of a fibre yarn, the strips which went into the machine flat have now come out a round thread, having a polish and looking like a new piece of straw. The spools upon which the yarn is wound hold about a hundred pounds each. At this juncture the fibre, as far as its manufacture is concerned, is ready to be woven into the rug.

Before this can be done, however, the fibre must be rewound once more so as to permit of its being used on the loom. Here, again, a special machine is required for the work. After the spools have been well filled they are taken from the spinning frames and placed on this machine, which winds them into cops to fit the shuttles of the loom. As in the process of spinning the fibre, female operatives tend the machines, taking



On the Slitting Machine the large roll is cut into widths suitable for weaving the paper thread



From the Roll to the Rug.

care of the process from the humidifying to winding the finished fibre upon the cops ready for the shuttles. Male operatives are, of course, necessary for the heavy work, such as operating the slitting machines and doing the actual weaving upon the looms.

#### *Coloring the Designs*

The loom for weaving fibre rugs must be of a special kind if the best results are to be obtained. When the loom is ready, and the warps prepared and all drawn in, the design and cards are ready for attention. Here is an important branch of the work as in all carpet weaving. While a design may be very artistic it is necessary to color it with fine shades in order to bring out all its good qualities. Many a good design has been spoiled for the want of good colors to show it up to its best advantage. And it is here that the adaptability of paper to a wide range of colors makes possible the beauty and attractiveness of the paper-fibre rug. After the suitable colors are selected, the loom is ready for actual weaving.

In the process of weaving a wide range of effects is obtained, not only by the use of different designs and colors, but by the introduction of wool for the manufacture of the part wool and part paper or fibre rugs previously referred to. In fact, the manufacturers believe that not only are the wool and fibre rugs highly attractive—it being possible to make up elaborate designs and color combinations—but their wearing qualities are greater in that they will not show the wear nor the dirt as quickly as the all-fibre rug. The wool seems to brighten up the rug, leaving the fibre in the ground for its support.

The addition of the small amount of wool, however, does not add to the cost or price of the rug as much as would be supposed, the product still being very cheap compared with the usual prices charged for ordinary textile carpets.

#### *Sizing the Rug*

After the woven rugs come from the loom, they are run through what is known as a size box containing a mixture suitable for stiffening them and setting the colors more firmly. Leaving the stiffening box, they go over the calenders, several in number, which are filled with steam, and these dry the rugs, making them lie flat on the floor. They are now finished and ready for final inspection before shipment.

In order to supply the demand for the paper-fibre variety of carpeting, manufacturers of the product are now making not only rugs in usual sizes, but also hall runners and bath mats, so that an entire house may be furnished with suitable floor covering of this kind. From bedroom to kitchen and porch there are suitable designs and qualities, differing to suit the needs of each. For example there is probably no better porch rug made for all-around use than a rug of wool and fibre. Particularly is this so because of its absolutely sanitary character under any conditions of weather or climate. It is odorless, creating no smell in damp weather, and it can be washed, scrubbed and otherwise cleaned as desired. Neither rain nor sun hurt it, for in the case of rugs for porch and outside use there is practically nothing to fade.

---

## Public Meetings in New Brunswick

Well-attended lectures at Saint John, Fredericton, etc.---Some Urgent Maritime Problems.

A second series of public meetings was held during November in New Brunswick by Mr. Robson Black, Secretary of the Canadian Forestry Association. With the co-operation and hearty assistance of such bodies as the Saint John Board of Trade, the Fredericton Science Club, and leading lumbermen and clubs of other centres, well-attended lectures were delivered. The itinerary included Woodstock, Fredericton, St. Stephen, Saint John, Sackville, Bathurst and Campbellton, and by a most generous co-operation of the leading newspapers verbatim reports of the addresses were spread by means of their columns to most parts of the province.

The Association has added to its equipment for use in these public meetings motion picture films and a portable motion picture machine. These are in addition to an excellent stereopticon equipped to 'dissolve' pictures on the screen in full colors.

### *Public Sentiment*

The difficulties in the way of more advanced forest conservation policies in New Brunswick are of such a nature as to make a persistent educational campaign the key to progress. Generally speaking, the people of the province are not seized of the reasons for a change in old-fashioned public policies aiming to perpetuate the forest supplies. The pleasant superstition of super-abundant forest wealth has been so long accepted as to form a very substantial volume of indifference when forestry subjects are mentioned. This, in turn, has exerted very little pressure on successive administrations at Fredericton. Only in very recent years have thinking citizens in large numbers awakened to the serious peril

facing the whole economic structure of New Brunswick, should the forests fail. That the forests actually are failing has been forced upon the realization of the most casual on-looker. The yield per square mile, the quality of the yield, have both been running down hill. Good timber becomes increasingly inaccessible.

The farther the Forest Survey goes, the lower becomes the average rate of yield, the greater becomes the percentage of relatively barren timberlands. New Brunswick's position as relates to her forest supplies is grave enough to cause every lumberman, every jobber, every townsman, to hold up both hands for an immediate application of conservative woods methods under the supervision of competent government officers.

Happily, the Forest Survey and Land Classification, instituted by the late Government, is being continued at full swing by the Foster administration, the new Minister in charge of forests, Dr. E. A. Smith, giving to the Forestry Division the most thorough support and encouragement.

### *Fire Protection Reforms*

At the next session of the Legislature, it will not be unreasonable to look for a revision of the whole fire ranging system of the province, substituting for the system of County Wardens (efficient in spots) a centralized organization under command of the Provincial Forester, Mr. Prince. This will go far to rid the province of forest fire losses, for although New Brunswick has travelled in great good luck during the past few summers, the total timber waste during the past twenty years has been enormous. Settlers' fires are allowed to run in absolute freedom, inviting from day to day a repetition of the

holocausts of North Ontario's Clay-belt in 1916 when 220 men, women and children were swallowed up in flames. Last summer, settlers were observed many times piling their slash against standing timber and setting the torch to the debris without either knowledge or care of the consequences. Nothing in New Brunswick's fire laws prevents this criminal conduct, except in two townships. New Brunswick has travelled in good luck, much as did Ontario's Claybelt for many years. One never can mark on the calendar, however, the day when the good luck shall come to an end. Modern forest protection systems are not built upon assumptions of luck, but upon exactness.

#### *Jobbers and Cutting*

The problem of supervising the cutting done by the jobbers calls insistently for Government action. This winter, a commencement is being made, and the Chief Forester has designated a number of his technical men to supervise the cutting, co-operating as far as possible with the timber scalers whose duties have always included inspection of cutting to see that the regulations are properly carried out. The new force of technical men will act in a supplementary capacity and doubtless will tune up the inspection considerably.

One of the quarters where educational work is very badly needed is in putting a stop to the raids on spruce lands by fake settlers. The Forestry Journal understands that the Government is opposing such efforts successfully, despite strong political pressure. Reference was made to this situation some months ago in the Journal, and the argument offered that the settler who, of his own free choice or as a dummy for an organized group, applies for a homestead knowing it to be non-agricultural land, filled with spruce, is a malefactor and should be treated without mercy. He is a bird-of-passage at best. He never intends to settle and could not on such land if he would. He pays no taxes to the public treasury. No sooner is he located, with a dozen of his fellows, than he besieges the Government for

a 'colonization' road and in very many instances forces upon the people that useless expenditure. The "homesteading" of non-agricultural lands by spruce hunters is a patent and dangerous fraud and no local member of the legislature has any business recognizing, let alone advocating, the request of his constituent in such a matter.

#### *Education from Within*

While the Canadian Forestry Association, through twenty public meetings, the distribution of French and English literature placed in the hands of thousands of New Brunswick citizens and teachers and children, the supply of free lecture sets on forest conservation to the schools and churches, a steady campaign of newspaper and magazine publicity, etc., has endeavored to bring to the doors of the people the plain facts of their present crisis, and to make the Forest Survey better understood, and the reasons for new reforms of forest administration palpable, it might be suggested that an educational branch of the Forestry Division, operated from Fredericton, would prove a valuable accessory to the administrative work now being carried on.

#### **CLEARING NORTH COUNTRY**

Hon. G. Howard Ferguson, Minister of Lands, Forests and Mines, is advertising for tenders on pulp and other timber in the townships of Idington and Owens on the National Transcontinental in Northern Ontario. A new project is being instituted under which it is proposed to cut strips of four chains wide through the townships, so that each farm or quarter section will have ten acres of cleared land. The purpose of this new plan of timber clearing is to encourage subsequent "cleared farm" settlement.

Ontario's wood-working industries use 54 different kinds of wood. Ontario is a great producer of railway ties; more than 5,700,000 were taken out of the forests last year.

# STAG

CHEWING TOBACCO

*"Ever-lasting-ly Good"*

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



Sold at  
10c a Plug



## THE WORLD OVER



### SPAIN TO ENCOURAGE NATIONAL PARKS

The King of Spain has sanctioned a law concerning the formation of National Parks:—

Under this law all those districts of the national territory shall be known as National Parks which are exceptionally picturesque, wooded or wild, and which are declared to be so by the State for the sole purpose of; facilitating access to them by suitable roads of communication; causing the natural beauty of the landscape, the wealth of flora and fauna, the geographical and hydrological peculiarities to be respected by protecting them in the most efficacious manner possible against all acts of destruction, deterioration or disfiguration due to the hand of man.

### PORTO RICO'S DESPOILED FORESTS

The island of Porto Rico is very sparsely wooded. The insular and geographical position of the country, its small size, its restricted area of level lands, and its density of population, have occasioned unusual demands on the forests. The same cycle of change is found here as is recorded by civilisation everywhere—the waste and despoilation of the bounties of nature, followed by an acute need for what has been destroyed.

Of the once extensive virgin tropical forest there now remain only isolated remnants in the most mountainous and wind-swept parts of the island. This tract has an aggregate acreage of between 35,000 and 40,000 acres and includes several thousand acres of brushwood. The total area of high forest is scarcely 2 per cent. of the total land area. Part of these forests belongs to the Government. There are, besides, about 400,000 acres classified as "timber and brush lands" and a few thousand acres of mangrove swamps. The total wooded area amounts to approximately 20 per cent. of the total area of the country; but not more than 2-5 of this area is now under forest capable of yielding a wood-product other than charcoal and fuel wood. If now there be added the 168,000 acres in coffee plantations and the 6,500 acres under coconut palms, the total of all lands under forest or brush cover will amount to 27 per cent. of the island.

### THE FRENCH MARKET FOR CANADIAN TIMBER

France consumes, every year, an enormous quantity of all classes of lumber products that Canada can furnish. In 1912 French imports in sawn timber and lumber, from countries subject to the same customs tariff as Canada were valued at 200,000,000 francs; in 1913 the amount was even greater. After the war, this demand will increase prodigiously on account of the necessity of building temporary shelters and of re-building destroyed property. It must be remembered that France has retaken from the enemy 753 towns (communes; containing 16,669 houses that must be completely reconstructed and 29,584 that need repairs; it must also be borne in mind that there are now 247 towns on the firing line and 2,554 towns at present occupied by the enemy. This referred to conditions in July, 1916.

In considering the question whether Canada can successfully compete for this trade, it is important to note that she has one incontestable advantage over the United States in enjoying the minimum tariff on manufactured wood, while they pay general tariff. The present supplies are received mostly from United States, Russia, Scandinavia, Switzerland and some through England, but none of these countries have any preference over Canada in custom duties.

## Recollections of Canada's Greatest Forest Fire

---

An interesting document has come to the attention of the Forestry Journal. It is an authentic description of Canada's most extensive forest fire, that known as the "Miramichi Disaster" in New Brunswick of October 7, 1825. The property damage has been variously estimated from one to twenty millions of dollars, but the loss of life was greatly less than was caused by the Ontario "Claybelt Horror" of 1916.

### *A First-hand Description*

Rev. Dr. W. O. Raymond, now residing in British Columbia, quotes a Methodist Minister, Robert Cooney, who passed through the awful experiences of the New Brunswick disaster, in the following picturesque strain:

"The tremendous bellowing became more and more terrific. The earth seemed to stagger as if it had reeled from its ancient foundation. The harmony of creation seemed to have been deranged. Earth, air, sea and sky; all visible creation, seemed to conspire against man and to totter under the weight of some dreadful commission they were charged to execute. The river, tortured into violence by the hurricane, foamed with rage and flung its boiling spray

upon the land. The thunder pealed along the vault of heaven; the lightning rent the firmament in pieces. For a moment, and all was still, a deep and awful silence reigned over everything. All nature appeared to be hushed into dumbness, when suddenly a lengthened and sullen roar came booming through the forest and driving a thousand massive and devouring flames before it. Then Newcastle and Douglastown, and the whole northern side of the river, extending from Bartibog to the Nashwaak, a distance of more than a hundred miles in length became enveloped in an immense sheet of flame that spread over 6,000 square miles.

### *"The Surges of the River"*

Mr. Cooney continued:—"What shall we say of the tremendous howling of the storm, dashing broken and burning trees and scorching sand and flaming houses through the air? What of the boiling surges of the river and its different tributaries, flinging their maddened foam all round them, and smashing everything that came within their fury? What of the indescribable confusion on board 150 large vessels imminently exposed to danger; many of them frequently on fire, some burning and others burned?"

"Even now, the shrieks, screams and cries of a wretched and beggared people involved in ruin, desolation

## **BOVRIL** **Saves Kitchen Waste**

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

---

and despair, ring their mournful cadences upon the ear. O God, merciful and just! how shuddering were the frantic cries; the wild expressions of horror, and the despairing groans of hundreds upon hundreds of poor homeless creatures, flying from their smoking habitations, they knew not whither, and mingling the thrilling cries of their anguish with the yells, roarings and bellowings of wild beasts and domestic animals perishing by fire and suffocation!"

#### *Witnesses Still Living*

Though the Miramichi fire occurred ninety-two years ago there are at least three persons now living who were in New Brunswick at the time, and old enough to remember it.

One of these is Mrs. Vanderbeck, who now lives at Millerton, in the Miramichi district. Her son is postmaster of the village. She saw the fire and distinctly remembers it. Another is William Henry Best of River Glade, Albert County, New Brunswick. Mr. Best will be a hundred years old in January. He "remembers vividly the day when the wind brought the smoke and burned leaves from the north to his home in Kings County."

The third is Mrs. George De Beck, who has lived in this province half a century, but spent the first half and something more in New Brunswick. This lady is now in her 103rd year, and was eleven years o'd at the time of the Miramichi fire.

#### *The Early Forests*

Says Rev. Dr. Raymond:—"The season had been an unusually dry one and forest fires were prevalent. On October 7, 1825, fire from the neighboring woods destroyed about eighty buildings in Fredericton, including the lieutenant-governor's residence. This fire was an offshoot of a conflagration that was raging over a large forest area. On the same day that Fredericton was so severely scourged the fire began to menace the settlements on the Miramichi. Up and down this river the territory was covered by a magnificent forest,

which held out the promise of great wealth in coming years, and which even then was contributing nearly half the exports of the Province of New Brunswick. It is estimated that the area swept by the conflagration was not less in extent than five or six thousand square miles. Any one caught in the forest who could not reach the Miramichi was doomed to die. Most of the settlers' houses between the Miramichi and Fredericton were burned and many lives lost.

#### *Towns Wiped Out*

The comparatively small number of inhabitants was the only thing that prevented the disaster from being even more appalling. Newcastle, with two hundred and sixty houses and nearly one thousand inhabitants, was almost totally destroyed; only twelve buildings escaped. Douglas-town experienced a like fate, and of seventy buildings only six were left. Moorfields was left in ashes. The settlements in Ludlow were utterly destroyed. Bartibog, Napan and Black River were involved in the common ruin. Sparsely peopled as was the country, the loss of life and property was not inconsiderable. One hundred and sixty people perished, 600 buildings were burned, seventy-five head of cattle were destroyed. The total loss was estimated at 227,714 pounds. But this was not all. Thousands of fur-bearing animals were destroyed. Even the fish in the rivers were killed in large numbers by the fierce heat or poisoned by the alkali of the ashes that fell into the water. Next to human life, perhaps, the most deplorable loss was the destruction of the forest, which represented the growth of ages.

"The year before the fire the quantity of hewn pine timber exported from the River Miramichi was greater than that of the St. John. Thousands of destitute people were glad to share the relief provided by public generosity. The subscriptions amounted to 40,000 pounds, including a donation of 1400 pounds from "His Most Gracious Majesty."

## One Man's Fine Record---Sixty New Members

In the exercise of unselfish and successful service for the promotion of the Canadian Forestry Association's membership, the palm must go once more to Mr. W. J. MacBeth, Lumber Manufacturers' Agent, 60 Brock Avenue, Toronto.

Mr. MacBeth, who regards the work of the Association as practical and far-reaching patriotism, has added no fewer than sixty new members in 1917 by his personal effort.

Last year, he did a similar fine stroke for the Association. Mr. MacBeth is a busy man and probably

has as many reasons as any other member for pigeon-holding the "add-a-member" cards sent out occasionally by the Secretary. While carrying on his business, however, he has not failed to speak of the Forestry Association's work to scores of acquaintances and has met remarkably few men who confessed indifference to the subject of forest conservation.

If every member of the Association would take the slight trouble of securing even one recruit, a most valuable service would be done to the country's interests.

## A Gift of 20,000 Socks for Forestry Men

An urgent appeal for assistance in raising a fund of \$5,000 has been sent out by the Canadian Lumbermen's Association.

The object is to send 10,000 pairs

### MINIATURE CONSTRUCTION

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

SCHOOLS — COLLEGES — MUSEUMS  
Government work a specialty

**MORGAN BROS. CO., Inc.**  
**MODEL MAKERS**

Room 1650 Grand Central Terminal  
Phone 7720 Murray Hill  
NEW YORK CITY

### R. O. SWEZEY

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

CONSULTING ENGINEER.

Water Powers. Timber Lands.  
Forest Industries.

164 St. James St. MONTREAL.

## CONFEDERATION LIFE ASSOCIATION UNCONDITIONAL ACCUMULATION POLICIES

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

Write for Particulars

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

HEAD OFFICE, TORONTO

of socks to the men of the forestry battalions overseas before Christmas, and as the need for socks is reported to be far beyond the supply, this very practical form of Christmas remembrance from Canada has been proposed.

Gifts of any amount, large or small,

will be received by Mr. R. G. Cameron, Hon.-Treasurer of the Canadian Lumbermen's Association, Castle Building, Ottawa.

As the bulletin rightly says: "The Canadian overseas with an axe in his hand is doing his bit to win the war."

---

## *Looking after the Cutting in N.B.*

---

The following interview recently appeared in the Gleaner of Fredericton, N.B.:

"This is a year of reorganization and the application of scientific method all over the world. Factories and farms, railroads and banks, mines and fisheries have had to get into battalion formation and serve the highest requirements of the State. What works during war will continue into peace. In the keen international contest for trade, only a prompt application by the provincial government of the policy of forest organization and economy can give this province the great advantages to which its wood supplies and water powers entitle it. Other countries have read the signs of the times and are harnessing their forests to progressive ideas of protection and operation. Competition will compel action eventually. To act to-day is a matter of business strategy and self preservation.

### *Lumbering for all Time*

"New Brunswick is essentially a greater lumbering province, not only for to-day but for all time to come. Lumbering is not a way station to agriculture except where the trees grow on agricultural soils. Seventy per cent. of New Brunswick is permanently unfitted for the plow. It will not pay the settler his salt. Obviously the laws of good provincial housekeeping require that not only the tillable but the untillable areas shall render to the public every dollar of profit of which they are capable."

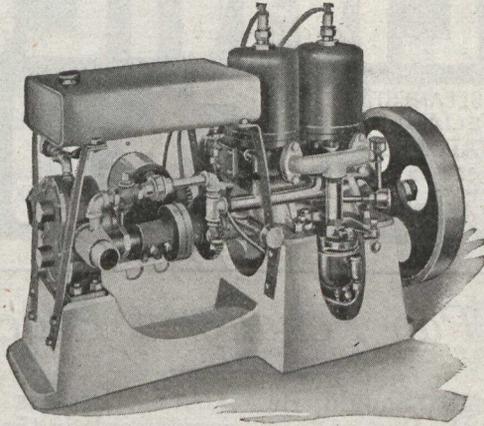
Mr. Black stated that two thirds

of Ontario and a larger percentage of Quebec must always be withheld from agriculture because of soil, topographic conditions, or climate. The problem facing all governments was how to keep out fire from the only crop these lands would produce, and how to regulate logging operations so that the supply of trees would suffer no diminution through all time to come.

### *Too Much Tree Waste*

"The present methods of unsupervised cutting have brought about a deteriorating forest. From 20 to 30 per cent. of the trees in a given area is left unused, whereas the United States National Forests have reduced this waste to 10 per cent. Except with very few companies in Canada reproduction is left more or less to chance and the chance plays continuously against us. With skilled supervision of the cutting, which is mostly in the hands of jobbers, the present rapid deterioration of timber areas can be arrested and the chief foundation of an enormous industry and of provincial revenues made secure for all time.

"You can burn a candle at both ends but not for long. The forests of Canada are not more than one quarter as extensive as those of the United States, which in turn are outclassed by Russia. Forests cannot survive the double attack of unregulated axe and flame. If New Brunswick's net-work of forest industries is to be maintained and developed, the pillaging of the raw materials by fire must be stopped, and stopped at once."



## FAIRBANKS-MORSE FIRE FIGHTING ENGINES

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

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

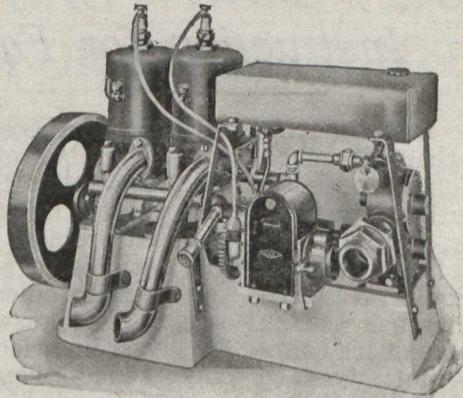
Governments and Private Owners of Forests everywhere, can materially reduce their fire losses by the use of these outfits.

Full information and prices on request.

### THE CANADIAN FAIRBANKS-MORSE CO., Limited

MONTREAL - OTTAWA

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



	<h1>RENNIES</h1>	
<p>PUREST-CLEANEST MOST RELIABLE GET CATALOGUE AT BEST DEALERS OR DIRECT TORONTO - MONTREAL WINNIPEG - VANCOUVER.</p>		
<h1>SEEDS</h1>		

## *Settlers Pay Penalty at Peace River*

Under the heading: "Should Be Sternly Dealt With," the Peace River (Alberta) Standard comments as follows upon the laxity of fire laws and enforcement by the Alberta Government:—

"The dire calamity accompanying the prairie and bush fire which has swept across Peace River country from Dunvegan to Bear Lake and beyond is a sad blow to many settlers striving to get upon their feet. The loss of a winter's supply of hay is bad enough, but on top of this is the destruction of millions of acres of pasture, cutting off any possible chance of even stock feeding until the coming of the winter season.

The carelessness and negligence of some people in the season of dry grass is positively criminal and such persons should be brought to justice. The aggravating part of it is that even should this be done it cannot restore the hundreds of thousands of dollars worth of property which has been destroyed in one fell stroke."

*Ed. Note.*—This annual hazard could be done away with very largely if the Provincial Government would apply a system of granting permits to all settlers wanting to burn slash in the dangerous seasons and provide for enforcement of strict laws to stop carelessness with fire by whomsoever caused.

## *Forestry Instruction for Farmers*

In the report of the Ontario Minister of Agriculture there is much interesting information, especially concerning the Junior Farmer Associations and the work of district representatives. One of the former has carried out 46 agricultural experiments; one of the latter has written 29 articles for the papers of his country. The locality is not given in either case, but neither the list of experiments nor the list of articles has any reference to forestry. This might well be included in the literary work of college and school. For the

farmer and the embryo-farmer there are a number of forestry problems that are intimately connected with the success of the farm. Perhaps the first problem is to decide whether the wood is to be cleared for planting or maintained as a source of income. The answer to this question involves knowledge of the kind of trees, what they are used for, the sizes demanded and the market conditions and values. Stands of spruce, pine, poplar, maple and mixed hard woods present different phases of the problem. In mixed stands it will

## P. L. BUTTRICK

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

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

Eight years experience in practical  
forestry work of all sorts.

## PHILIP T. COOLIDGE

FORESTER

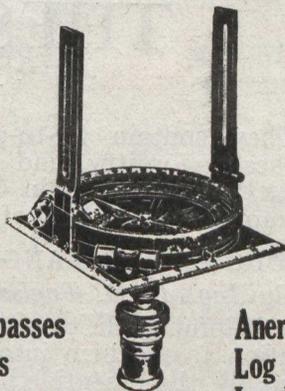
Technical training and ten years  
experience, in part with U. S. Forest  
Service.

Timber Estimating and Mapping  
Supervision of Lumber Contracts  
Surveying Forest Planting

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

## FORESTERS AND RANGERS

EVERYTHING YOU NEED  
CAN BE SUPPLIED BY US



Compasses  
Tapes  
Scribes  
Transits  
&c.

Aneroids  
Log Rules  
Lumber  
Gauges  
Levels, &c.

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

# 50<sup>CTS.</sup>

## WAR TIME SPECIAL OFFER

ONE WHOLE YEAR  
FOR FIFTY CENTS!

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

## ROD AND GUN

IN CANADA

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

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

# YOU SHOULD HAVE THESE HELPS!

They contain up-to-date information covering the various branches of forestry, and have been written by men who are recognized as authorities in their respective fields. Your library will be complete with copies of these books.

## HANDBOOK FOR RANGERS AND WOODSMEN.

*By Jay L. B. Taylor.*

A helpful guide to all engaged in woods work, and those whose recreation takes them into rough and unsettled regions. It covers thoroughly the essential problems of woods work, and explains all unusual trade or professional terms.

429 pages, 4 $\frac{1}{4}$  x 6 $\frac{3}{4}$ , 236 figures. Flexible binding, \$2.50 net.

## THE THEORY AND PRACTICE OF WORKING PLANS.

*Second Edition, Thoroughly Revised.*

*By A. B. Recknagel, B.A., M.F.*

This book is the result of the author's study abroad and the experience gained in years of work for the forest service in various parts of the United States.

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

## LOGGING.

*By Ralph Clement Bryant, F.E., M.A.*

This book covers the principles and general methods of operation in the United States.

608 pages, 6 x 9, illustrated. Cloth, \$3.50 net.

## FOREST PHYSIOGRAPHY.

*By Isaiah Bowman, Ph.D.*

Covers the physiography of the United States and principles of soils in relation to forestry.

781 pages, 6 x 9, illustrated. Cloth, \$5.00 net.

## FOREST VALUATION.

*By Herman Haupt Chapman, M.F.*

310 pages, 6 x 9. Cloth, \$2.00 net.

## MECHANICAL PROPERTIES OF WOOD.

*By Samuel Record, M.A., M.F.*

173 pages, 6 x 9, illustrated. Cloth, \$1.75 net.

# Canadian Forestry Journal

119 Booth Bldg., OTTAWA.

be a question of what to cut out, and when. An understanding of the elements of proper cutting and lumbering would greatly benefit many a farmer.

One of the biggest problems in Canada to-day is the disposal of slash and brush. A recent fire in British Columbia raged over an area of timber slash. Whether the fire could have been stopped there if the slash had been properly disposed of is an interesting question. Many serious fires have been started by farmers' brush fires. Permits have relieved this situation very materially. An intelligent farmer is the best safe guard.

#### PAPER AND STEEL

The latest census of manufacturers in the United States shows that in America the manufacture of paper is second in importance only to the steel industry. The total invested capital is estimated at \$500,000,000, while the annual value of the manufactured product of the paper and pulp amounts to \$350,000,000.

#### WHY MAHOGANY COSTS ARE HIGH

Mahogany timber primarily is no more highly valued in its native country than many of our own familiar woods. The things which make mahogany costly to the consumer in this country are the difficulties encountered in locating, cutting, and bringing the timber to market.

Some of these cost items are set forth in detail in a recent consular report on mahogany production in Guatemala. This report says it costs \$12 per 1,000 feet to load mahogany logs on ships. There is a cost of \$15 for railway transportation, and the ocean freight, which we generally



**QUEEN'S  
UNIVERSITY**

KINGSTON  
ONTARIO

**ARTS MEDICINE  
EDUCATION  
APPLIED SCIENCE**

Mining, Chemical, Civil, Mechanical and  
Electrical Engineering.

**HOME STUDY**

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

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

GEO. Y. CHOWN,  
Registrar.

**UNIVERSITY OF  
NEW BRUNSWICK**

FREDERICTON, N.B.

**DEPARTMENT OF FORESTRY**  
Established in 1908

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

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

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

For further information address :

**DEPARTMENT OF FORESTRY**

University Calendar furnished on  
application.

**C. C. JONES, Chancellor.**

figure low, runs from \$15 to \$20 per 1,000 feet.

These items of cost tell their own stories of the difficulties encountered in railway transportation and loading. Twelve dollars per 1,000 feet for loading logs on shipboard would sound like a hold-up price in this country, but this loading is done in localities where labor-saving devices are scarce and many difficulties are encountered.

It is pretty much the same story in the matter of railway hauling. Most of the timber is no more than

twenty-five miles from the coast, yet often there is a railway charge involved running up to \$15 per 1,000 feet. The ocean-going freight is uncommonly high at the present time but the other items of cost are not unusual, and they serve to illustrate graphically why it is mahogany timber is high by the time it reaches the consumer. Perhaps some day we shall be able to introduce more modern methods, and cut down some of these items of cost. Meantime, however, other items involving increased expense will likely accrue, such as having to go further into forests after the timber.

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



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

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

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

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

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

**PERFECTION SLEEPING BAG WITH PNEUMATIC MATTRESS**

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

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



# SEEDING and PLANTING IN THE PRACTICE OF FORESTRY

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

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

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

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

## *Chapter Headings of This Book:*

Part I. Silvical Basis for Seeding and Planting.

Chap. I. Definitions and Generalities.

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

IV. The Principles which Determine Spacing.

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

Part II. The Artificial Formation of Woods.

VI. General Considerations.

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

IX. The Protection of Seeding and Planting Sites.

X. Preliminary Treatment of Seeding and Planting Sites.

XI. Establishing Forests by Direct Seeding.

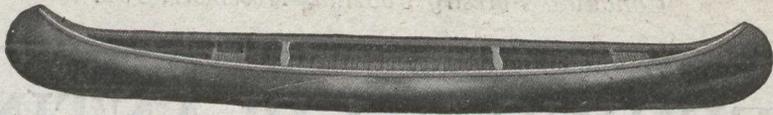
XII. to XV. The Forest Nursery.

XVI. to XVII. Establishing Forests by Planting.

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

## Canadian Forestry Journal

119 Booth Bldg., OTTAWA.



## PETERBOROUGH CANOES

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



**Peterborough Canoe Co., Ltd., Peterborough, Canada**



**The Campers Favorite  
"BLOW BED"**

(Successors to Metropolitan Air Goods Co.)

## SLEEP ON AIR with a COMFORT SLEEPING POCKET

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

**ATHOL MANUFACTURING CO.,**

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

Dealers write

## FOREST FIRES



When fire breaks out the Chief Ranger whose territory is covered by a Telephone System can summon his forces in the quickest possible time.

Only a fraction of a second is required to connect his portable telephone set with the telephone line and he can then give the alarm over the entire reserve. We have developed special apparatus for permanent and portable telephones for forest protection.

For full particulars write our office nearest you.

**Northern Electric Company**  
LIMITED

Montreal  
Halifax  
Ottawa

Toronto  
London  
Winnipeg

Regina  
Calgary  
Vancouver

**Northern · Electric · Forest · Telephones.**