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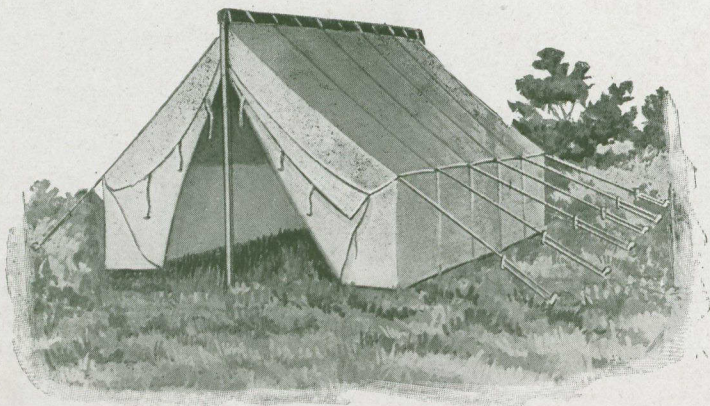
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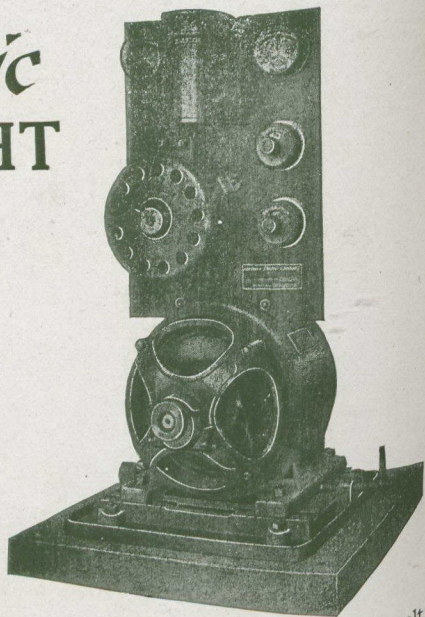
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# Canadian Forestry Journal

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No. 6

## Has the Hour Arrived for Constructive Forestry

By Ellwood Wilson, Chief Forester; The Laurentide Company, Grand Mere, P.Q.



Quebec Government is now prepared to assist operators aiming at a sustained yield.



Canada has, in the past 10 years made great progress in the conservation of its timber resources and should be proud of it. By conservation I mean rational utilization and elimination of waste. Forest fires are not as frequent or as disastrous as formerly, though much can still be done along these lines. A beginning has been made at mapping and classifying our forests. A strong public sentiment has been aroused and much educational work done. In actual practical utilization however, practically nothing has yet been done, logging methods have not changed since lumbering started and much valuable wood and many valuable by-products are still going to waste. Logging is an engineering problem and should be carried out by trained engineers. In order to insure a supply of timber it must be carried out according to certain well defined principles which come under the head of Forestry. Lumbering should be conducted by forest engineers. There has been prevalent for many years the idea that only men brought up in the woods, who were rough and handy with their fists and had gained their experience by handling an axe or a heavy, could handle logging operations. As well expect a civil engineer to have learned his profession with a

pick and shovel or an hydraulic engineer with a level and trowel. The trouble with the so-called practical man is that he has learned all he knows by experience and has generally no knowledge of underlying principles. When confronted with a situation which has never previously come under his experience he either applies his experience literally or is entirely at a loss. He works by rule of thumb or precedent. The trained man on the other hand, knows the fundamental principles and soon learns to apply them generally.

Now there is one basic principle underlying the use of our forest resources, that of a sustained yield. That is to say we have built up the lumber industry and the pulp and paper and wood using industries which are absolutely dependent on wood as raw material. It is inconceivable that after a period of years, only a moment in the life of a nation, we should scrap these industries. Take the Province of Quebec as an example. The great bulk of its area is good for nothing but to grow forests. Are we going to deliberately give up our lumber industry, our pulp and paper industry after fifty years? Where will our wood using industries get their supply of raw material? Where will our

farmers get the wood they need, where will they work in the winter months, how will our mineral resources be developed without wood? We must protect our forests from fire and we must manage them for a continuous yield. New industries are good but they must not be developed beyond a point where the supply of raw material ceases to be sufficient. The first essential is an accurate estimate of the total supply of wood and the total amount growing each year. When this is ascertained the consumption must be fitted to the annual production. It is only a question of time until this will be absolutely necessary and the Province which first has the courage to take the bull by the horns and handle its forest resources rationally will do most to stabilize its wood using industries and to perpetuate its prosperity. If this is not done, the time will inevitably come in eastern Canada when the forests will begin to dwindle and the industries to decline and we to take their place. We have only to look at sections of the United States which were once thriving communities and are now abandoned, for proof of this. We have only to see the situation of the news print industry in the United States and to hear its cry that its raw material is nearly exhausted and that they must have Canadian wood in order to exist to know the truth of my statement. The Canadian pulp and paper industry realizes this and has come to realize it through a careful stock-taking of its timberlands. See how many of the large companies are beginning to reforest artificially!

#### CHANGED WOODS METHODS.

But, and here is a very important query, why do they not change their methods of logging, why do they not utilize more of the wood that is wasted? In not a country in the world is natural regeneration so easy and so certain as in Eastern Canada and it is absolutely necessary that natural and artificial reforestation should go hand in hand. The reason that no attention is being paid to natural regenera-

tion or to better methods of logging, is that operators wish to keep down their logging costs, and the manager of woodlands operations is judged on no other basis than the price at which he delivers his logs. He makes his logs and delivers them as cheaply as possible and no one can blame him. The history of logging has been that it has followed the line of least resistance. Only the best timber was marketable, only cheap wood could go into paper in the early days or concerns would have been bankrupted. The most accessible timber was logged first, river banks and lake shores were cut clean, then the easily drivable streams. Logging was contracted because it could be done cheaper by a small contractor and required no capital outlay for logging gear and so forth. The waste by these jobbers has been enormous. They have taken the best of the timber and left that which was difficult to get out and now this timber is scattered and difficult of access and the price of getting it out would be almost ruinous. Everyone is looking for new bodies of timber to log cheaply.

#### PRICES AND FOREST METHODS

Now while prices are good, when there is a market for all kinds of wood, is the time to make a radical change in the management of our forests and in the methods of exploiting them. We must begin to manage for a sustained yield and most of the large paper companies are carrying on experiments looking to this end. Different methods of cutting have been tried and the results are being studied. Such methods have been carefully worked out in Europe and have the sanction of experience. Here it will take years to develop the best methods but we know enough to begin and a beginning should be made at once.

#### NO BLANKET SYSTEM

Let it be stated most emphatically that there is no one method for handling Canadian forests. That is the great mistake which our Provincial

Governments are making in the forest regulations. Imagine, for instance, making the same cutting regulations for the whole of a Province the size of Quebec or Ontario, where conditions vary so enormously. The Quebec Government realizes this and on application will examine any area and allow changes in the regulations. Each tract of a few square miles is a problem in itself and must be treated as such. Plans for cutting should be made ten years in advance and changed as experience dictates, but should always be made with the idea of cropping any given area continuously or of cutting it clean and reforesting it, either naturally or artificially. **This will raise the logging cost but, mark you, not permanently.** As the forests begin to improve and the crop becomes heavier and of better quality the costs will decline owing to a heavier yield and greater accessibility, owing to permanent roads and other improvements. The costs will tend to become stable and uniform over periods of time. The Province or firm which commences such sensible management will be cutting timber near at hand and cheaply, relatively, when others are looking to Labrador, Ungava and Alaska for small trees which may or may not prove to be in existence.

The question has been asked, are we ready to undertake such management of our forests? I say that we are, that the psychological moment has arrived when we should lay the foundations for a sane and practical forestry policy which will make Canada the greatest pulp and paper producing country in the world **FOR ALL TIME.**

### THE WORLD'S FORESTS

The forest lands of the world are estimated to amount to about 4,000,000,000 acres, or about 24 per cent. of the world's total land area. This estimate does not include the forest areas of China, Korea and the larger part of South America and Africa for which even fair approximations are not available. The United States, with about 545,000,000 acres under forest has 2-

826 billion feet of merchantable timber, and its cut, which in 1918 amounted to 32 billion feet, is several times that of any other country.

### FORESTRY IS THE KEY

By the adoption of practical forestry methods, the United States in the next half century without depleting the standing timber supply could meet all domestic demands for lumber and could export from twenty to twenty-five billion feet annually, says an article in the Commerce Monthly published by the National Bank of Commerce, New York. At present the timber supply of the world outside of the tropics is being used more rapidly than it is being renewed by growth.

### CANADA AS A SHIP BUILDER

Interesting data on Canada's ship and boat building industry in 1918 is contained in a preliminary report by the Dominion Bureau of Statistics, covering 90 shipbuilding and 114 boatbuilding establishments. The amount of capital invested was \$56,299,033, in the former branch and \$1,145,906 in the latter. The thirteen shipbuilding plants of Ontario were shown to represent capital invested to the amount of \$28,254,963; Quebec, nine plants, \$14,423,090; British Columbia and Manitoba, \$9,551,604; Nova Scotia and New Brunswick, \$4,069,376. In the boatbuilding industry the distribution shows Ontario with \$640,917, Quebec \$65,259, the Maritime Provinces \$291,31, and the Eastern Provinces \$148,349.

### HIGHWAY FORESTER

H. J. Moore, who resigned from the position of Chief Gardener of the Queen Victoria Park Commission, has been appointed by the Ontario Provincial Government, Forester of Provincial Highways. His work will largely be the beautification of roadways by planting shade trees and shrubs along them. His headquarters will be in the Parliament Buildings, Toronto.

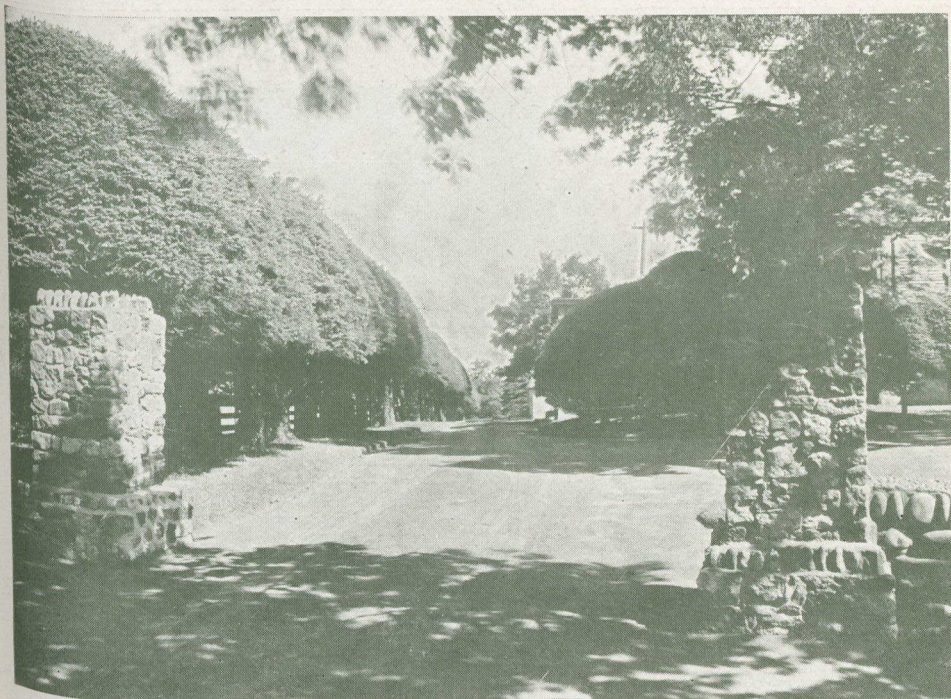


In beautiful Prince Edward Island: a shade tree arrangement on Longworth Street, Charlottetown.

## Canada's Plans for Aerial Patrol

Arrangements have now been satisfactorily completed between the Air Board and the Department of the Interior, and the necessary Government authority secured, for the operation of aircraft in Alberta and British Columbia for the purpose of aerial patrol against forest fires. Preparations are now being hurried forward and it is hoped that at a very early date aerodrome accommodation will be secured near Morley and a sufficient number of hangars erected to house six D.H. 9a aeroplanes and their requisite supplies. Owing to the fact that the season is already so far advanced it will not be possible to carry out a full pro-

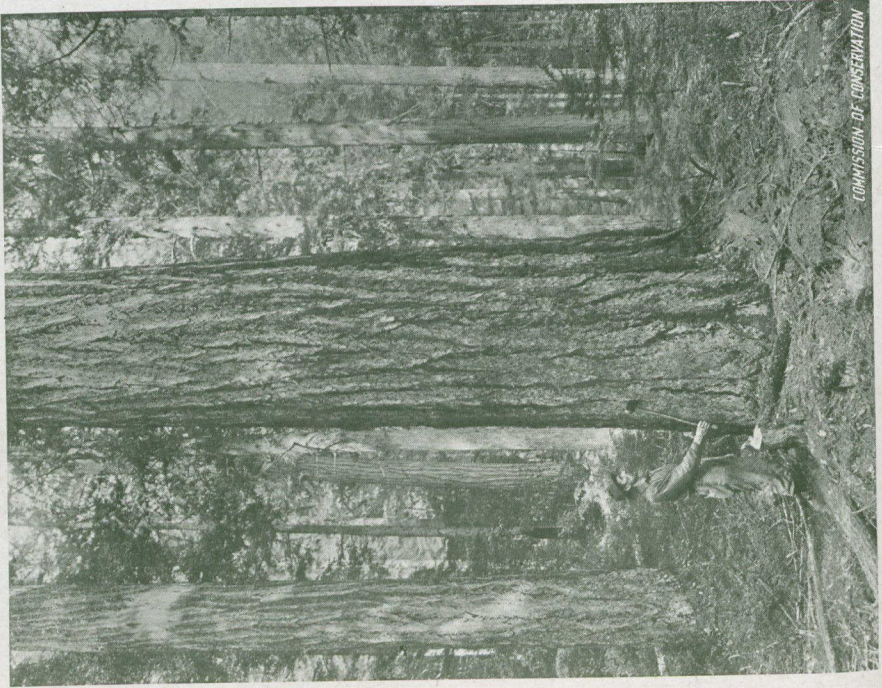
gram this year, but it is expected considerable experimental work will be done and that effective results will be secured toward the latter end of the summer. Operating from Morley the patrol has been arranged in a northerly direction just east of the Rocky Mountain Park as far north as Mountain House, where a sub station will eventually be established. From Morley the patrol will proceed in a southerly direction as far south as the Watterton Lakes Park. Communication will be maintained with the base by means of wireless telegraphy. The area outlined contains a sufficient number of open spaces to provide



An odd shade tree effect in Yarmouth, N.S.

emergency landing ground should a machine have engine trouble in the air. The D.H. 9a aeroplane is essentially a war product and while not altogether suited to the work in hand should provide the Air Board and the Department of the Interior with sufficient data with which to plan more extensive operations next year. Similar operations have been planned in British Columbia but since British Columbia is essentially a seaplane country a different type of machine will be used. The work of establishing a base at Vancouver has already commenced. The patrol in this instance will proceed in an easterly direction from the base, covering the Dominion Forest Belt as far north as

Kamloops and in a north-easterly direction up the Straits of Georgia covering the westerly coast of British Columbia, in which locality there are some of the most valuable stands of timber in Canada. This area, of course, belongs to the Provincial Government in combination with which these operations are to be carried out. The machines to be used on this patrol will be the 504 K Type Avro on floats, 130 Clerget engine, H.S. 2L. Flying Boat, Liberty engine, and F. 3 Flying Boat, Rolls Royce engine. It is expected that in conjunction with the work of forest fire patrol other correlated work can be accomplished, such as hydrographic survey, photographic survey, fishery protection patrol, etc.



COMMISSION OF CONSERVATION

A Fine Sample of Douglas Fir, Fraser Valley, British Columbia.



COMMISSION OF CONSERVATION

Western White Pine, Fraser Valley, B. C.



## Replanting France's Ruined Forests

The case for replanting the forests destroyed and felled during the war, and for the afforestation of other regions of France is forcibly stated by M. Paul Descombes in *La Revue de Paris*.



Photo—Courtesy W. N. Millar.

Sabot makers and hut in forest de Camora, France.

In peace times the forests of France only produced one-half of the timber employed in national industry. Among the lessons taught by the war has been the necessity for each nation to produce enough timber for its own consumption, and France is far from doing this.

In 1913 the timber consumed in France is calculated at just over 14 million cubic metres, of which there was produced in France, 6.7 million cubic metres; imported in the round, cut, and pulp, 7.4 million cubic metres; total, 14.1 million cubic metres. (1 cubic metre equals about 5 cubic feet.)

This shows that France already needed to double its production of timber; but authorities are of opinion that to replace the destructions of war and make up stocks will require in addition 6,000,000 cubic metres of timber during each of the five years following the war. There are thus two

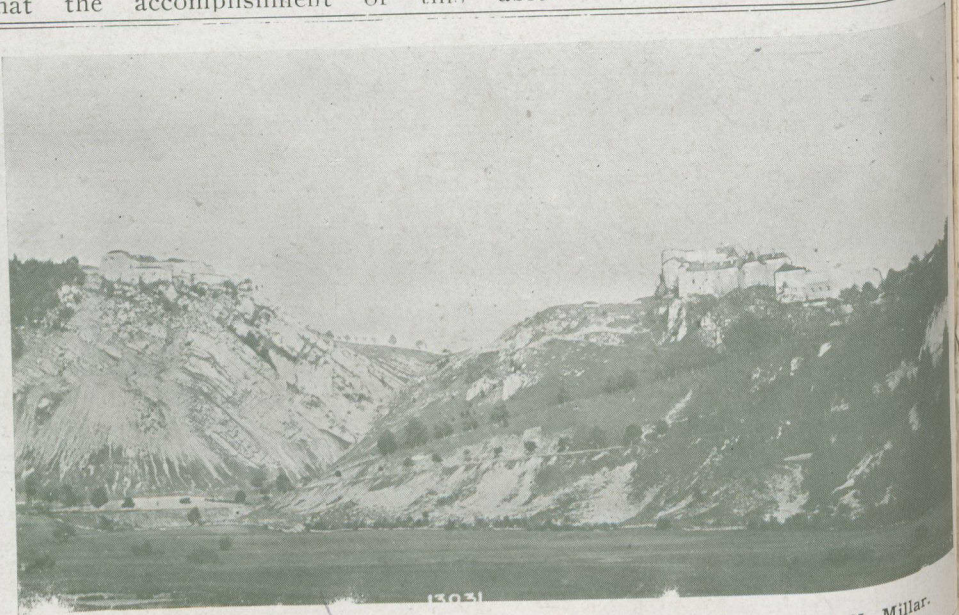
problems: (1) To double the permanent national production; (2) to procure an extra annual 6,000,000 cubic metres during five years. The first requires a permanent arrangement; the second may be partly met by obtaining timber as part of the indemnity payable by the enemy countries. Until that happens it is believed that the French Colonies can send timber, and more quickly. In order to do so it is necessary to restore the wholly devastated and the partly destroyed forests, and to afforest an increased area of land. A scheme published in 1907 in *l'Economiste Francaise* provided 4,000,000 hectares (about 10,000,000 acres), and included in the purchase of land, works of improvement, better management, annual subventions, and stopping the denudation of mountain surfaces, at a total cost of about £70,000,000 sterling. But this scheme would only have increased the forest area by half while double the



Dense balsam at 100 years of age in forest of Sevier, France. Photo—Courtesy W. H. Millar.

production is required. On the other hand, by better cultivation a larger proportion of good timber can be secured and less firewood; and the use of trees of rapid growth is now prevalent. Hence it may be anticipated that the accomplishment of this

scheme in 20 years would enable France to produce within three-quarters of a century all the timber necessary for its consumption. It is believed that the achievement of this programme in 20 years is quite realisable.



Old French forts on the Swiss border—Note the roadside trees on the slopes. Photo—Courtesy W. N. Millar.



Photo—Courtesy W. N. Millar.  
Where two roads in the French forest of Labergement meet.



Photo—Courtesy W. N. Millar.  
Spruce plantation made to extend the forest of Labergement.

## Let the Prairie Farmer Raise His Trees

The question is often asked by Journal readers: "If the Nursery Station at Indian Head is already producing trees for prairie planting fully up to its capacity, how is any new demand to be met? Can farmers grow their own trees from seed?"

Mr. Norman M. Ross, Chief of the Tree Planting Division, has the following to say regarding the farm nursery under prairie conditions:

"Where seeds of native trees can be obtained the cheapest method of getting seedlings is for the planter to grow them himself. Most of the hardy varieties are very easily raised from seed, the labour and expense in this connection on a farm amounting to very little.

Seed should always be procured, if possible, from mature trees growing under climatic and other conditions similar to those the seedlings will be expected to endure. The Manitoba maple has a very wide range, and seed might be procured almost anywhere in North America. It would be found, however, that that picked in the Southern States or even in Eastern Canada, would not produce seedlings hardy in the Prairie Provinces. The growing season is much longer in the East than in the West, and it has been found that seedlings from eastern seed do not ripen up or mature early enough to escape the fall frost on the prairies, and are consequently cut back. The greater the difference there is between conditions of growth affecting the parent trees and those experienced by the seedlings, the greater the difficulties the latter have to contend with. This shows that many characteristics are acquired by the seed from the parent trees, so that

it would always be wise to get seed from the best individuals and to avoid, where possible, taking it from dwarf or stunted trees. Seed from young trees does not generally have so good a germinating percentage as that borne by mature ones.

The amount of land a farmer would require for his nursery is very small; in fact, one-quarter to one-half an acre would be more than sufficient in the ordinary case. Any land that is in a suitable condition for growing garden crop and is at the same time moderately protected from the high winds, would do for this purpose. The best soil for the nursery is rich, sandy loam. It should be located near the house so that the work could be done in odd moments."

### WHAT U.S. FACES.

(The Journal of Forestry)

The annual consumption of timber is one hundred thousand million superficial feet.

The present annual growth of timber is thirty-five thousand million superficial feet.

Eighty per cent. of the standing merchantable timber is privately owned, and ninety-seven per cent. of the annual cut comes from privately owned forests.

The national and state forests cannot meet the situation.

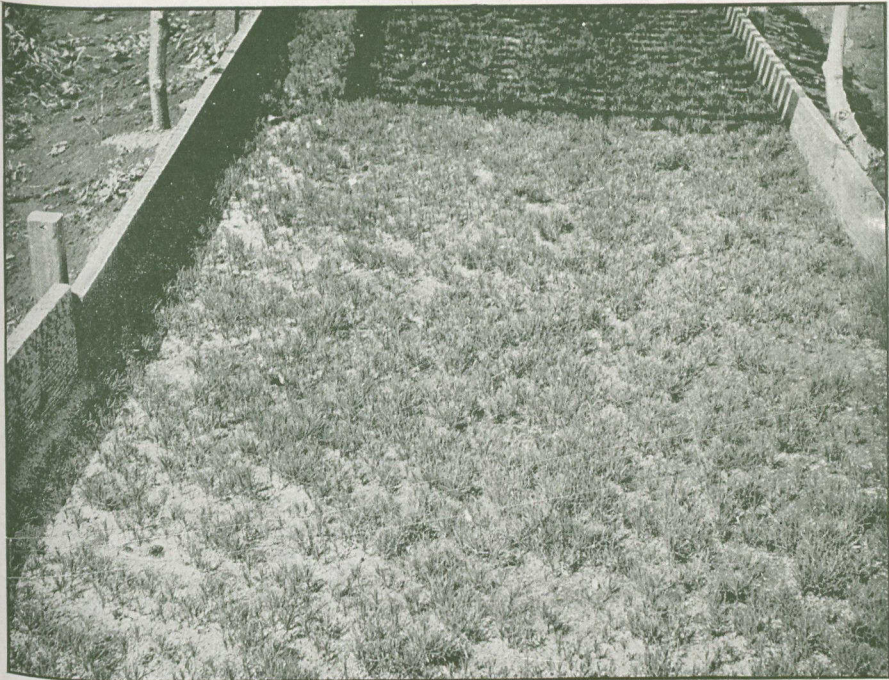
A timber shortage already exists in the United States and is rapidly becoming acute.

Prices will continue to increase.

### THE COMMON STORY

New South Wales (Australia) once contained millions of acres of cypress forest in the Central division; but today the forests which have been left are chiefly either grass paddocks, or stocked mostly with small undersized trees up to 9 inches in diameter.

(Australian Forestry Journal)



A farm tree nursery, by which abundance of trees can be produced cheaply.

## Some Big Timber of Antiquity

By Roland G. Kent, University of Pennsylvania

Many advertisements make a feature of the unusual size of the timbers which the firs may supply, or even picture the large size of the trees, standing or felled, from which they may satisfy the most extraordinary demands. In view of this, it may not be without interest to note what the ancient Romans had in the way of enormous logs.

In the year 301 A.D., the Emperor Diocletian issued an edict fixing maximum prices at which articles of trade might be sold; for then, as now, a period of wars and inflation of the currency had led to an appalling rise in prices; and the charge was made, even as it is today, that profiteers were taking undue advantage of the situation. Be that as it may, parts of copies of this edict, engraved on stone,

have been found in some two score places in Greece, Asia Minor, and Egypt—the section of the Roman Empire which was under the special charge of Diocletian, and which alone, apparently, was subject to the price regulation. In the extant portions of the edict, over one thousand items of trade are listed, with their prices; wages also were regulated, not merely for skilled and unskilled labor, but for the learned professions, such as those of the law and of teaching.

Now to come to the point: In the twelfth schedule, which deals with building timbers, we find the following regulations, which we give here not merely translated into English, but with the units of weight and value expressed in the usual United States units:

Fir beam, 72 feet 9 inches long, 17.5 inches square .....	\$217.00
Fir beam, 65 feet 5 inches long, 17.5 inches square .....	173.60
Fir beam, 58 feet 2 inches long, 17.5 inches square .....	130.20
Fir beam, 50 feet 11 inches long, 15.5 inches square .....	52.08
Fir beam, 40 feet 9 inches long, 17.5 inches square .....	42.40
Fir beam, 43 feet 8 inches long, 13.1 inches square .....	34.72
Fir beam, 40 feet 9 inches long, 11.6 inches square .....	26.04
Pine beams, at the same prices as for fir.	
Oak beam, 20 feet 4 inches long, 12.4 inches square .....	1.09
Ash beam, 20 feet 4 inches long, 8.8 inches square .....	1.09

The portion of the edict is broken off at this point, so that we know no other prices for lumber items. In comparing them with the prices of today, we should remember that these are maximum prices, and that the emperor expressly ordered dealers not to sell so high if they could sell at lower figures! Which did not work out in practice, for within four years Diocletian gave up the struggle and abdicated the imperial power, disgusted with the state of affairs. Just what happened we do not know, except for the vague news that the fixing of maximum prices resulted in much bloodshed and in hoarding of goods which produced a still greater scarcity and the edict was repealed at some date unknown.

But we should think of these prices rather in comparison with the wages of laborers; for the Emperor Diocletian tried to set maximum limits also for these. The highest wages were, for a shepherd, 9 cents a day; for a farm laborer, a camel driver, an ass driver, a mule driver, 11 cents; for a mason, a carpenter, a wagon smith, a ship builder working on ships for navigating rivers, 22 cents; for a ship builder working on ships to sail the open seas, 26 cents; for an inside house painter, 33 cents; for a painter of wall decorations, 65 cents. All of

these were, however, provided with their meals; but a lawyer could not charge over \$5.45 per case, no matter how long it lasted, and his meals were not provided while it went on, either!

The most astonishing thing is that such large timbers as those first on the list should have been sufficiently regular articles of commerce to be listed in the edict. The first item is 60 per cent. larger than the "big sticks sawed on a special order, 9½ inches by 24 inches by 62 feet," featured in a recent advertisement. Again, the question has been raised as to how they were used by the ancients; and a conjecture that they were used in ship building is confirmed by another advertisement which offers big timbers for this very purpose.

But these big sticks were far surpassed by others of which we hear in the Natural History of Pliny, the Roman statesman, scholar, admiral, and scientist, who lost his life while investigating the eruption of Mount Vesuvius in 79 A.D. In the twentieth book of this Natural History, which is really an encyclopaedia, Pliny tells us that the largest beam ever seen at Rome was one of larch, brought there as part of a consignment of lumber in the reign of the Emperor Tiberius, who ruled from 14 to 37 A.D. This particular beam was of such size, that instead of being used for construction, it was exhibited as a curiosity until some time in the reign of Nero (54-68 A. D.); it was 120 Roman feet in length (about 116 of our feet), and two Roman feet square throughout its length. This somewhat surpasses in length the 110-foot timbers advertised in magazines recently, the breadth and thickness of which are not stated. We hear elsewhere that larch logs were brought from the Rhaetian Alps, on the northern border of Italy; and we are left to wonder how a beam of such length and weight could have been transported by the ancients, devoid as they were of steam and electrical power, and even of wagons running on rails. Human and animal power alone were theirs, but they knew and used the windlass and the lifting crane. From



Fredericton, New Brunswick, the home of beautiful street trees.

the Alps this great log must have been slid and dragged to the Lake of Lugano, or to a neighboring lake, and thence painstakingly through a narrow stream which is the outlet, to the Po River, where it could be loaded upon a ship of sufficient size to transport it. Perhaps it was later transferred to a larger vessel before the long and rough voyage down the Adriatic, around the end of Italy, and up the west coast to Ostia, at the mouth of the Tiber; from which it had still to be carried upstream the few remaining miles to Rome.

Another beam, one hundred Roman feet long and eighteen inches square, is mentioned by Pliny as having been brought to Rome in the time of the Emperor Augustus (who ruled 31 B. C. to 14 A. D.), by his minister Agrippa, for the construction of the building where the Romans cast their votes. It proved to be too large to use, and

was still there, viewed as a curiosity, in Pliny's time, over half a century later.

Then there was the mast of the great ship which brought from Egypt the obelisk which the Emperor Caligula (37-41 A. D.) set up in the Circus on the Vatican Hill; this same obelisk, by the way, now stands in front of the great Basilica of St. Peter's, not far from the spot where it was first erected in Rome. But the ship that brought it was so large that it took up the greater part of one side of the harbor at Ostia, and the mast was so huge that it took four men with outstretched arms to girdle it. Such masts as these were said to cost 80,000 Roman sesterces, which would be over \$4,000 in our money; and the general belief is, that money bought from ten to twenty times as much in those days as it does now. No! as it did fifteen years ago, which is quite another thing.

# Tree Windbreaks as a Farm Asset

By Carlos G. Bates, U.S. Forest Service



## Convincing Proof Gained From American Experiments How a Windbreak Adds Dollars to the Prairie Farm



When the prairie farms of the middle West were first developed, the lack of trees was felt severely. The clear sweep of the winds across the flat plains was a great hindrance to agriculture, for the soil was dried out quickly by evaporation, and grain was lodged and orchards injured by the mechanical force of the wind. Windbreaks were the only remedy, and thousands of miles of them were planted along roads and farm division lines. The effect of this planting, though only gradually felt, was very distinct;

farming and living conditions became more favorable throughout the whole region.

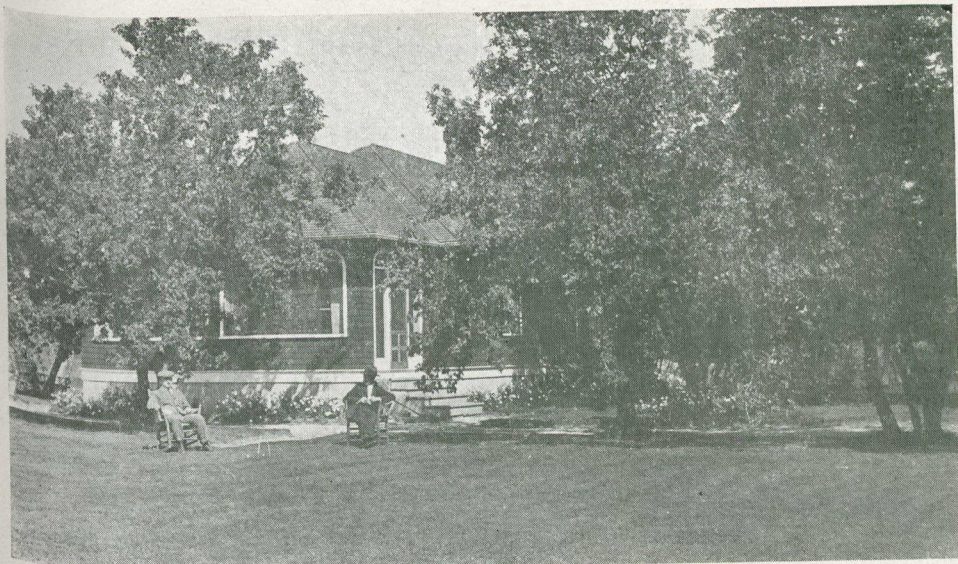
Considerable planting is still being done, but probably no more than enough to counterbalance the cutting in windbreaks already planted. Of course the need of windbreaks is not so acute now as it has been in the past, but some extension of the planting in this region is desirable, at least enough to protect the new areas which have been put under cultivation.

Any body of trees which gives pro-



Effect of favorable atmospheric conditions on growth of corn plants and yield of fodder. On right, in protected zone (weight 81 pounds); on left in unprotected zone (weight 42 pounds).





A cure for prairie baldness: An inviting summer home near Winnipeg, amply shaded with trees and protected against prairie winds.

tection to buildings or crops may be called a windbreak. This article has to do, however, only with belts of trees planted about fields and farm buildings, especially for the purpose of breaking the force of the wind. The typical windbreak is a belt consisting of from six to eight rows of trees and usually from a quarter of a mile to a mile in length.

#### CHECKING WIND MOVEMENT

The influence of a timber windbreak upon air currents is purely mechanical. Its effectiveness depends, therefore, upon how nearly impenetrable it is. The ordinary windbreak does not provide an absolute barrier to the wind; a certain amount of air forces its way between the branches and foliage of the trees, so that the movement of the air on the leeward side is not completely stopped but only greatly reduced. When windbreaks composed of such trees as cottonwood become old, wide openings are left between the bare trunks and more wind gets through near the ground than higher up. Such windbreaks can be made efficient only by underplanting the cottonwood with other trees or shrubs.

An ideal windbreak for checking wind currents would have the con-

tour of an earth dam. In the central rows would be planted the tallest trees, Such a windbreak would not be easily penetrated, and its inclined surface would divert the air currents upward and relieve the horizontal wind pressure.

Breaking the mechanical force of the wind benefits the farmer most directly by protecting his grain crops and his orchard. The value of the windbreak in giving this protection is, of course, difficult to measure in dollars and cents, but where winds are at all frequent such protection alone may be equal to the rental of the ground occupied by the trees. In one case in southern Minnesota a windbreak, 80 rods long and about 28 feet high along the side of a cornfield, afforded complete protection for a strip about 10 rods wide during a wind blowing at 50 miles an hour. On the unprotected part of the field the wind blew down half the corn and bent the remainder halfway, the damage beginning at the edge of the 10-rod strip and increasing until it was greatest in that part of the field farthest from the windbreak. The corn was in the milk stage at the time of the high wind and did not produce more than a third



Trees on the prairie make all the difference between a "house" and a "home." View taken at Indian Head, Sask.

of a crop on the damaged area. On the protected portion the total saving was 260 bushels, or the full crop of 6 acres, whereas the windbreak occupied only 2 acres.

Movement of the topsoil also may be checked and dust storms prevented by breaking the force of the wind. For this reason windbreaks are of immense benefit in sandy regions or regions where the soil is very fine.

Added to the crop and soil protection there is the personal comfort to be derived from protection from wind about the farm and home and along public roads. Furthermore, a protected home is heated in winter more readily, and hence more cheaply, than one exposed to the wind.

#### REDUCING EVAPORATION

There is no part of the United States, except small areas in the Appalachian and Cascade Mountains, which normally obtains more precipitation than is needed for growing the best crops. The farmer usually plows, cultivates, and mulches with the object of conserving every drop of water that may reach the soil during the year. In the "dry-farming" regions of the West these conservation measures are carried farthest. Here it may be necessary to save the moisture of two seasons to grow a single crop.

Anything which helps to conserve the moisture of the soil is of direct benefit to the farmer. The windbreak has this effect in a marked degree. The drying power of the wind is reduced by the windbreak very nearly in the same proportion as its velocity. In the immediate lee of the most effective windbreaks evaporation is reduced as much as 65 per cent. Farther from the trees the reduction is less. The amount of reduction depends not only upon the density and proximity of the windbreak, but upon whether the field is fallow or in crops. The saving in moisture is least when the field is fallow, so that the only reduction is in the direct evaporation from the soil; it is greatest when the field is in crops, so that there is a reduction not only in the direct evaporation from the soil but also in the evaporation from the leaves of the crops. The more frequently winds occur in any locality during the growing season, and the greater their velocity and drying power, the more important it is to use every means of preventing evaporation. Windbreaks are especially valuable, therefore, in the Middle West, where hot, dry winds, often of high velocity, are of frequent occurrence during the summer months and in Montana and the Dakotas.

where the warm west winds of the winter and early spring, known as "chinooks," do great damage to winter wheat and orchards.

### EFFECT ON TEMPERATURE

The farmer who has cultivated crops on a hot summer day need hardly be told that the warmest part of his field is the portion which is sheltered from the wind. In the lee of the windbreak there is not only no breeze to cool the body and reduce what is known as the "sensible temperature," but the actual temperature of the air is raised. Tests with a thermometer has shown that the area which is protected by a windbreak may be several degrees warmer during the day and several degrees cooler during the night than adjacent areas not protected.

Such crops as corn are benefited very greatly by warm, sultry days. The windbreak helps to create these conditions and offsets to some extent

the effect of cold, cloudy weather. The cooling effect at night is of course unfavorable to growth then; but the night is a period of comparative rest, so that the nocturnal cooling off is far more than counterbalanced by the higher temperatures secured during the day.

### WHAT ABOUT ORCHARDS

Windbreaks may appear undesirable for the protection of orchards in blossom or garden crops which are not hardy, because the danger of still frost seems increased by the stagnation of the air on the lee side. The added danger is more apparent than real, however, for still frosts only occur when there is practically no wind, and a windbreak can then have little effect one way or the other. Furthermore, complete stagnation of the air may be helpful rather than harmful if smudging is resorted to.

The freezing which often causes the most severe damage to orchards is



How much of Prince Edward Island's abundant agricultural prosperity is due to the protection afforded by belts of trees? No section of the Dominion enjoys a less interrupted prosperity, nor is the pastoral beauty of Prince Edward Island easily surpassed.

that which follows a cold rain or late snow. During such a freeze the damage to blossoms is greatly reduced by protection from wind; for evaporation which produces a rapid cooling increases in proportion to wind velocity. During a freeze of this kind in Nebraska in 1908, fully protected orchards yielded crops many times as heavy as those without exterior pro-

tection, and even the leeward side of individual trees exposed to the wind suffered much less damage than the windward side. It is noteworthy also that the one storm of rain and snow, with a temperature of 28 degrees, did all the damage during the season, and that later frosts with lower temperatures did not affect the orchards.

## THE FORESTER IS BOTH SOWER AND REAPER

By Dr. B. E. Fernow, *Dean Emeritus, Faculty of Forestry,  
University of Toronto*

The forester is in the same business as the lumberman, namely to supply wood materials to the community. He is not after the beauty, but after the substance of the tree; he also uses the axe to harvest the crop, nay, he utilizes the forest even more closely than the lumberman, but in this utilization he introduces one new point of view, namely that of the economic use of the soil for **future** crops. He is not satisfied with the mere harvest of what nature had accumulated, leaving it to nature to do as it pleases in re-establishing the forest, but he feels himself obligated to provide systematically for a new and, if possible, better crop. Under his care the trees will also be cut and removed, but the forest will persist. He is the preserver of the forest, not in the manner in which the public is often made to believe, namely by preventing the use of the wood, but as all life is preserved, by removing the old and fostering the young growth. He is a sower as well as a reaper, a planter as well as a logger, and to him forestry is, with regard to wood crops, precisely what agriculture is, with regard to food crops.

### CANADA'S GREATEST DAM

The Gouin (La Loutre) dam, on the upper waters of the St. Maurice

river, Québec, has a storage capacity of 160,000,000,000 cubic feet and a water area of 300 square miles, forming the second largest storage reservoir in the world. It is exceeded in size only by that of Gatun lake, on the Panama canal. The storage at Gouin will permit a regulated permanent flow of over 12,000 cubic feet per second at Shawinigan, rendering 1,000,000 horsepower now available on the St-Maurice.

### CANADA'S PELT SALES

In the fiscal year, 1918-19, 12,723,000 pelts were imported into the United States from Canada. These imports included large numbers of rabbit skins from Australia and New Zealand and also about 250,000 sheep skins from Australia, New Zealand, India and Peru. These figures demonstrated that Canada is exporting more furs than ever before in her history, and that the number of fur-bearers taken in 1918-1919 was in excess of the annual increment, thus trenching upon our capital stock.

The demand for furs and the slaughter of fur-bearers necessary to meet this demand may be judged from the fact that at the London April fur auction sale 8,780,582 pelts were offered.



COMMISSION OF CONSERVATION

Through Cheakamous Canon, P.G.E. Railway, British Columbia.

## Planting Trees for Permanent Fences

By E. J. Zavitz, Provincial Forester of Ontario

The question of securing fence posts at a reasonable rate and their short life after being placed in the ground is a problem confronting the agriculturist in Ontario. One solution of the problem may be found in planting trees along permanent fences. In a short time it will be possible to attach the wires to these trees.

The trees can be planted every sixteen feet or even every eight feet as the owner desires. Strong, vigorous plants should be chosen for such work and in the case of using evergreens, transplants should be used as the fence lines are frequently filled with dense grass and weeds which will endanger the young plant. More attention can be given the making of planting holes and the actual planting than in the case of waste land planting. Where a rail fence now exists and there is no chance to cultivate, the planting hole should be made by cutting away a large sod about two feet square. Occasionally it may be practical to cultivate a strip four to six feet wide along a fence which can be moved a few feet after the trees have grown. Preparation of this strip by summer fallowing will give results in future tree growth which will repay the effort. Whether planting is done in planting holes or on a prepared strip, future cultivation will give best results. This cultivation should be carried on for two years at least—longer will pay—until the trees have become well established. It will be an advantage to mulch the trees with grass or old manure. The trees should be inspected during the summer to see that weeds, etc., do not overshadow them. In case the owner does not want large trees along cultivated fields, the first planting can be done every sixteen feet and a few years later trees can be planted between. When the first trees become too large they can be cut off the height of a common fence post and later the fence can be attached to the younger generation of trees as the older ones decay.

The choice of species for this work must be given some consideration. The fastest growing species will be Box Elder, Hardy Catalpa, and Black Locust. In the southern portions of the Province and in the best classes of fresh, moist soils Hardy Catalpa may prove valuable for this purpose. Black Locust will grow on the poorest of locations and will be of more general value than Hardy Catalpa. Sugar Maple may be employed in this work, although the growth will be slower than the preceding species and it requires very good soil. Some may desire to plant nut producing trees so that a return may be had from nut crops. Black Walnut, Shagbark Hickory, and Chestnut would be the most valuable in this case. The Chestnut would grow on the lighter soils, while the Black Walnut should be planted in good, rich soil. If evergreens are desired, Norway Spruce, White Spruce, Larch and Arborvitae will give best results. The Arborvitae should be placed in moist soil, while Larch will stand dry, poor locations.

Mistakes made in the selection of species of trees for highway planting, may not be discovered in a decade. In order to make such mistakes less common and to safeguard the public against errors in spacing of trees and selection of species for our highways, the following simple principles are offered:

1. Use only such trees as are comparatively free from destroying insects and diseases.

This will eliminate at once such trees as the black locust, the elm, the fruit tree, and any others which may have local enemies.

2. Use trees adapted naturally to the soil and climate of the locality.

For example, a burr oak section should not have its highways planted with pine nor should a red pine section be planted to burr oaks.

3. Pure planting of one species should not be used for distances exceeding one mile.

4. Use trees that are native to the locality wherever possible. They give quick results and furnish variety.

5. Along roads that have been entirely denuded of tree growth, plant a temporary and a permanent tree alternately. An example would be: The sugar maple for permanent and the box elder for quick results and removal later when the sugar maple had attained useful size.

6. Space trees on the highway according to the spread of their crowns at maturity. Taking the sugar maple as an example with a spread of crown of 35 feet from the stem we see that a spacing of less than seventy feet will permit the interlacing of branches which is not desirable with highway trees; therefore, a safe spacing for sugar maple is 85 feet with trees on the opposite side of the highway to alternate. A planter may determine the safe highway planting distance for any species by measuring the crown spread of a fully mature specimen of that species and adding ten feet to the result.

### FREEZING ROOTS OF TREES

(Saskatoon Star)

One can plant trees or shrubbery here with practically perfect assurance that they will live through the first winter, which is the time of danger, if proper care is taken of them. Many gardeners get the idea that if they can prevent the roots from freezing they are doing the proper thing, whereas it is perfectly natural for the roots of all the trees and shrubs to freeze up during the winter months, and does no harm whatever. The proper method is to let the roots freeze in the fall, waiting for good stiff winter weather to accomplish this. Once they are frozen, during the first winter they should be covered deep with any kind of covering that will prevent them from thawing out too early in the spring. If the snow is deep around them this will help, but in any case they should be covered over.

What does damage is alternate thawing and freezing in the spring,

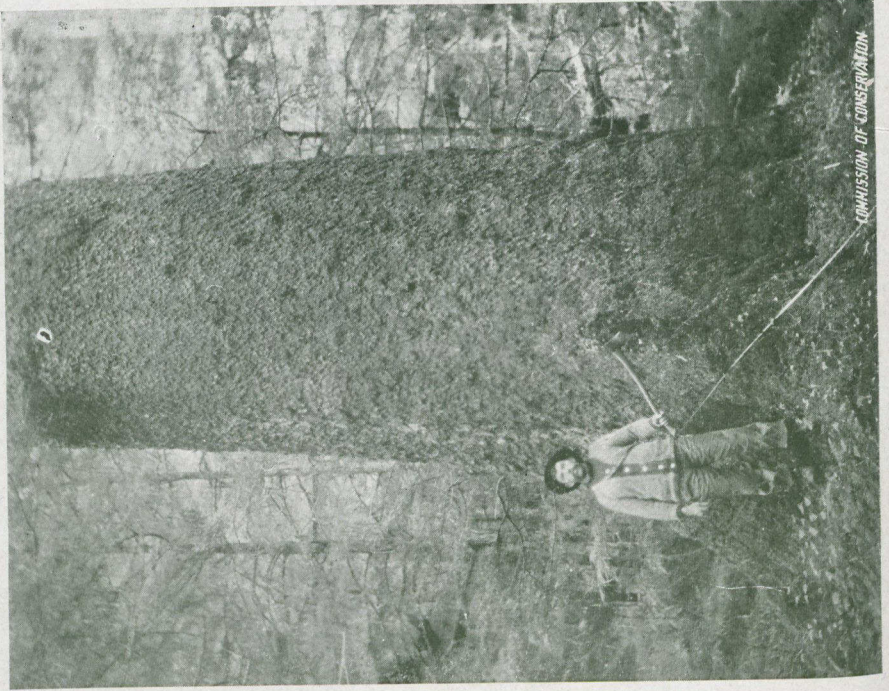
and it is the same thing with fall wheat. If the spring weather is consistently cold, and the break-up gradual, then the wheat will winter well. If, however, there is an early and complete thaw, and then later freezing weather again, fall wheat, or trees, shrubs and perennials, are likely to be "winter-killed." Consistently cold weather in the winter, with a slow break-up in the spring, is the best possible protection.

### POCKETBOOK TESTIMONY

"In regard to forest conservation, the organization of public support is facilitated by the fact that the question directly affects the pocketbook of practically every member of the community.

"It affects every man who wants to build, buy or rent a house—or furnish a home. The rising cost of lumber has been a decided factor in retarding the building of houses to relieve the housing shortage that has contributed so largely to the dissatisfaction and unrest that are current today. It affects every man who buys a newspaper or periodical, a book for his library or textbooks for his children at school. It touches the pocket of every merchant, manufacturer or other business man who buys advertising space. It affects every man who has a dollar invested in forest industries and our total capital investments in these enterprises approaches the stupendous sum of \$400,000,000. Finally, it affects every man employed in such industries of whom there are more than 80,000, with many additional thousands employed in wood-working establishments of one form or another that are directly dependent upon forest production.

"There isn't any question as to the motive behind forest conservation. It is a question purely of hard business sense—not of sentiment." (From an address by Mr. James White, assistant to the chairman of the Commission of Conservation).



The Tree That Makes Aeroplanes — Sitka Spruce, at Naden Harbor, British Columbia.

COMMISSION OF CONSERVATION



Mammoth Red Cedars, Fraser Valley, British Columbia.

COMMISSION OF CONSERVATION



# Restocking the Woods of Rural England

By John Parkin, M.A., F.L.S.

The beauty of Rural England has suffered in no light manner through the wholesale felling of plantations, due to the exigencies of the war. Sylvan features, familiar and pleasing to several generations, have vanished. The old landed aristocracy and country squires loved their woods and well-timbered parks, regarding them more as amenities—game and sporting preserves—and the removal en bloc of fine stretches of woodland would have perturbed them greatly. Little did they who planted these woods imagine what value they would one day be to old England. The love of sport and the love of trees for their own sake have largely proved the salvation of the country with respect to its timber requirements. Governments in the past have ever neglected to take up practically the question of afforestation. It has been left in private hands—those of the much maligned landowners; and, however faulty their forestry may have been, if it had not been for their efforts, Great Britain would have been sorely tried to supply her needs. Experts, in fact, never thought these Islands could have furnished the quantity of timber required to keep going the mines and other essential industries for so long a period. The amount forthcoming from the plantations and covers—the smaller woods generally—was underestimated.

## A WAR TIME GAIN.

Though our squirearchy in the past were, as a whole, great arboriculturists and tree-lovers, with few exceptions they could hardly be said to be sylviculturists in the modern sense. In fact, viewed from the economic standpoint, the clearing away in wholesale fashion of many of our woods was the best treatment that could be applied to them. Understocked, promiscuously mixed with trees often short and

rough in bole, they would in pre-war times hardly have paid for the felling and haulage. Now, the ground being clear, there is the chance of their being planted on the most approved sylvicultural principles.

Whatever defects these woods may have had in the eyes of the trained forester, no one can deny that they were eminently picturesque and beautiful. The promiscuous mixture of species, the abhorred of the sylviculturist, lent charm and variety. Understocking allowed glades to arise and prevented a too severe repetition of boles of the same type. How different appears a wood grown on up-to-date forestry lines—a closely grouped mass of trees of the same kind and pattern with no relief to cheer the eye. Hence one is led to exclaim how often does the picturesque clash with the utilitarian, and how often does gain in usefulness entail loss in beauty! It would seem that some compromise is ever necessary to prevent our drifting into ugly efficiency and soul-killing monotony.

## ENGLAND'S PARKS

Our woods, parks and hedgerows have made Rural England the admiration and the envy of the foreigner. How tame and uninteresting does the Continent appear in contrast. I am not thinking of scenery in the conventional sense; but of the plains—the agricultural areas—of the two when compared. Now the fear may be that in replanting our war-felled woods, we may go to the other extreme and sacrifice beauty wholly in the altar of utility. Beauty in our surroundings has doubtless a subtle effect on our general well-being. We know that to repair the ravages of war, production on sound economic lines is essential but in the strenuous times ahead, let us have some thought always for the beautiful in our reconstructing

schemes. In the towns our domestic architects in the past were responsible for much hideousness; in the country, on the other hand, our landowners achieved much beauty. In our endeavour to remedy the former, let us not reverse the latter by a too frequent repetition of woods of the same character.

To plant pure is a sound silvicultural maxim. To follow this out to the letter will result in plantations of a severe type—largely consisting of rectangular areas of a single species of conifer, as this class of tree gives

the quickest return. With the exception of the larch, conifers are evergreen, and save for a brief period in late spring, when the new needles are put forth, they do not change their aspect during the course of the year. Woods, especially those situated on level ground, when composed wholly of pines or firs, present a sombre appearance and are apt to weary the eye. They require relief by the addition of deciduous trees, both to supply variety and to allow of the seasonal changes being manifested.

## Planting Clumps for Protection of Stock

By E. J. Zavitz, Provincial Forester of Ontario

On stock and dairy farms clumps of trees afford valuable protection during the heat of the day. It is a common sight to see animals retreat to the shelter of trees which may happen to stand in the field. In permanent pastures and even in fields occasionally used for pasturage small clumps of trees could be planted in corners or waste portions of the field if any existed. It would be necessary to fence in such planting and give it protection till the trees reached a size of three or four inches in diameter.

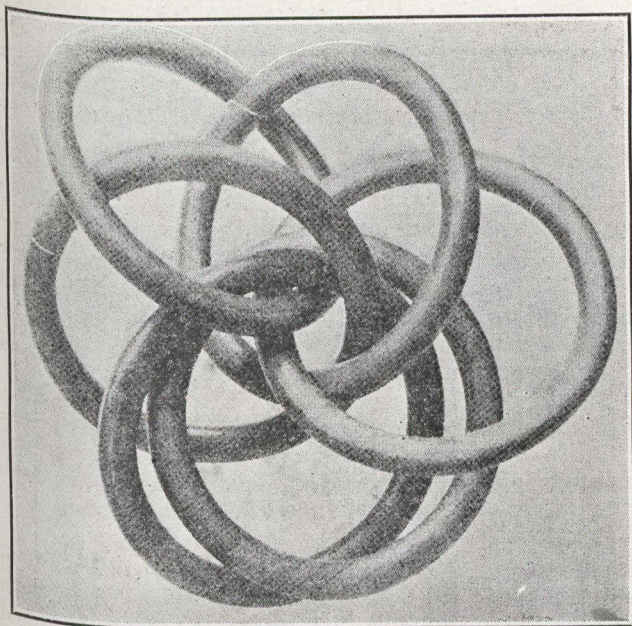
Deciduous trees, as Box Elder and White elm grow fast, develop plenty of shade, and stand the abuse to which they must be subjected by the animals.

Belts or rows of trees are frequently planted for protection to orchards, fields or buildings. There is no doubt about the advantage of such planting. Stock in protected barns will need less feed. Protected houses will need less fuel. Orchard or field crops benefit by having protection. The drying winds of summer do less harm where tree protection exists. Orchards heavy with fruit are often protected so that loss from wind-falls and broken branches is lessened. Protected fields of clover, fall wheat, etc., hold the snow longer in the spring, which gives protection from frosts and loss of moisture by evaporation.

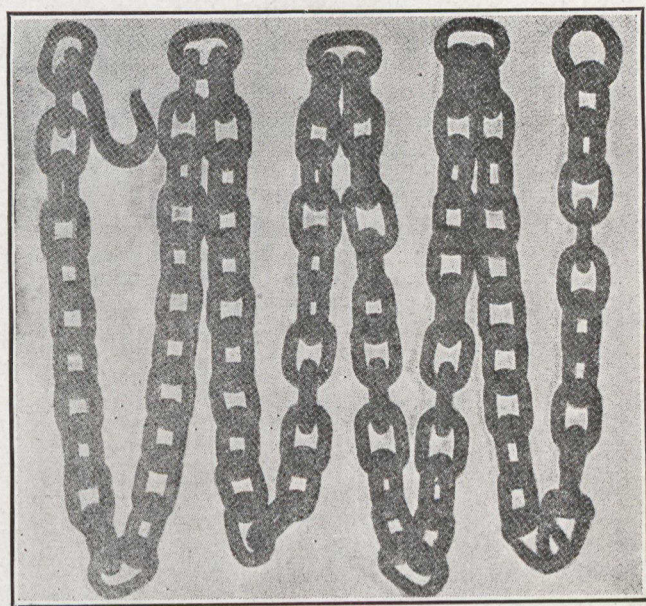
Throughout the Province of Ontario the prevailing winds are westerly, which should be taken into consideration in planting shelter belts. Any delay in the adoption of the scheme prolongs the period of the timber shortage and the losses arising therefrom.

### LIMITS, BELGIUM'S SIZE.

Probably the greatest amalgamation of timber and paper companies in Canadian history took place recently by which the Riordon Pulp and Paper Co., Montreal, took over the holdings of Gilmour and Hughson, and W. C. Edwards & Co., linking them to the extensive Riordon properties known as Kipawa Company and the Ticonderoga Pulp and Paper Company. The combined timber limits are 12,000 square miles, an area larger than Belgium, and contain 25 million cords of pulpwood, nearly one and a quarter billion feet of standing pine, 150,000 horsepower of water-power. The most valuable holdings of white pine in the world are said to be within the borders of this unified forest empire, the pulp and paper output of which will be about 150,000 tons per annum.



A masterpiece of six interlocking rings carved out of a single piece of wood.



A whittled chain about six feet long, carved out of one wood block

## Some Remarkable Whittling

In "A Whittler's Reminiscences," printed in *The Guide to Nature*, A. T. Cook, of Hyde Park, N.Y., relates some of the events that led up to the production of the remarkable bits of

wood-carving illustrated herewith -- remarkable not as works of art, but for their difficulty and intricacy. Mr. Cook believes that a boy might better spend his time on whittling of this

sort than on much that is taught in the schools. The mere ability to make and mend is profitable through life, he asserts. Writes Mr. Cook:

"As far back as I can remember I was always a whittler. At four years of age, three years before I went to school, I had a pocket-knife all my own, and well do I remember my joy in whittling things from pine blocks and dyeing them in the bright colors of the dye my mother used for carpet rags. To my young mind it was a wonder that anything could be made so exquisitely beautiful. A year before this I secured a table-knife and in cutting with it slashed my left forefinger dreadfully. This was seventy years ago, but it seems almost as yesterday that my dear mother bound it up and relieved the pain with kisses, as only a mother can. I carry the scar to this day.

"As time went on I whittled out better things, a multitude of them. Indeed I often whittled until my knife made my hand so sore I was compelled to stop, and then I wept because I could not whittle more. I whittled things curious, ornamental and useful. I made and sold many kites at the fabulous price of two cents each, and for some of the larger and finer ones I was actually paid three cents each. I saved the money too, spending very little for gew-gaws and never a cent for tobacco or intoxicants, a practise that has continued through my life and been a source of constant satisfaction and joy to me.

"It would take pages to tell all I whittled when a boy. There were water-wheels and wonderful wind-mills that showed men churning, sawing wood, etc., as well as puzzle blocks, joker mills, secret self-locking boxes, fancy fans and captive balls. One of my early hobbies was self-setting mouse-traps. I designed a half-dozen or more original patterns. Each mouse on entering set the trap for the next one. To my unbounded delight most of the traps fulfilled the purpose for which they were made.

"Then followed the chain shown in

the illustration. It is of butternut-wood, about six feet in length and contains ninety-five links, including ring hook and swivel. I timed the making and it took just sixty-three hours, most of the work being done in the evening while my good father read for the family.

"About this time I found there was a demand among my neighbors and friends for some of my products, and I was only too glad to sell them, for money was a pretty scarce article in those days. Picture-frames, knife-boxes, nail-boxes, boot-jacks, axe-handles, rat traps, mouse traps, clothes horses, and the like, brought me much needed money and the encouragement to make larger things. I made and sold a great number of writing desks, bureaus, washstands, office tables, secretary bookcases and type cabinets — things that counted, for some of them sold for as much as sixty dollars, a big sum at that time. A sixty-dollar sale, however, brought me no more joy than the sale of a two cent kite in the early days.

"But with the whittling I was always just crazy over gardening, and somehow I got to growing and selling garden seeds, and the ever-increasing demand for these was perfectly astonishing, so much so as to occupy all my time. For forty years I did but little whittling.

"Somewhat recently I thought I would see if in the forty years' interruption I had forgotten how to whittle, so I cut out the six interlocked rings shown in the illustration herewith. These rings, cut from a solid chunk of wood, are, I think, the most complex and difficult piece of work I have ever done. Each ring goes through all the rest. If any think them easy to make, let them try it. It was a queer piece of wood just before the rings were separated.

"My experience proves that whittling is useful, profitable, and of far more value through life than much that is taught in the schools. The ability to make and mend things is most desirable and saves time, vexation and money. Encourage children

to whittle. It will benefit them in many ways. Never mind if they sometimes cut their fingers. They

will get well again. Don't buy them many toys. It will be much better to let them whittle them out."

## ABITIBI CO'S. FORESTRY WORK FORGES AHEAD

Iroquois Falls, Ont.:—Since its establishment last summer the Forestry Department personnel has been hard at work along a number of different lines and considerable progress has been made in work accomplished to date.

The experimental Valuation Survey or Reconnaissance begun last fall has been brought to completion and as a direct result that method of survey most practicable and economical, under the given local conditions, has been determined and will be followed in the Reconnaissance of our Limit.

A detailed Base Map of our Holdings is at present in the course of compilation. The detail shown thereon will be increased from time to time as additional information is secured by crews in the field.

The intensive Regeneration Survey, carried on jointly with the Commission of Conservation, has been completed and much detailed information regarding the regenerative capacity of the Limit has been made available. This information is fundamental and essential to the development of an economic system of reforestation and will likewise aid in the development of such practices as will assist in sustaining the yield of those species of timber most valuable to the industry.

Detailed Growth Studies to determine the rates of growth of the various species have been carried on over average areas on the Limit and Rate of Growth Tables and Volume Tables have been compiled from the measurements and studies made. The former of these two tables will be used in connection with Reforestation work and the latter in the compilation of the Timber estimates which will be a part of the Reconnaissance.

Field Investigations have been made, the object of which have been

to determine possible ways and means for increasing our yield through a closer utilization of the trees cut and so further the conservation of our timber resources.

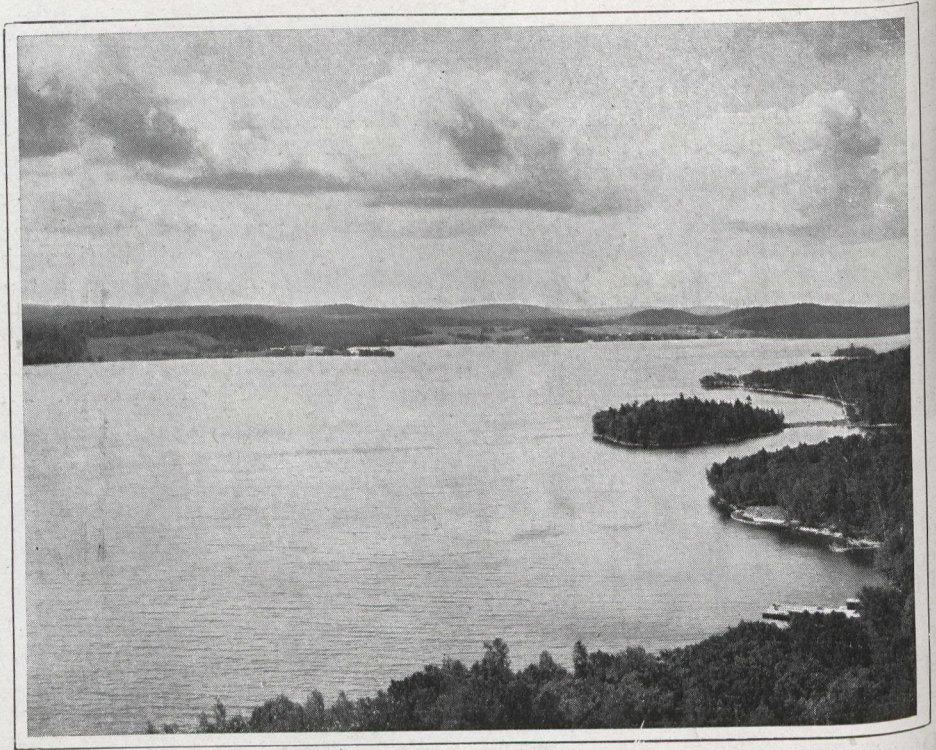
The season's work on the Nursery at Twin Falls has already commenced. The Nursery, initial ground for which was cleared last summer, will be placed on a producing basis during the coming summer months. Seed will be sown this year in quantities to yield ultimately over 2,000,000 trees. Increased quantities of seed will be sown annually hereafter until the Nursery has been placed upon the required productions basis.

The early part of May will see the Reconnaissance or Valuation Survey of the Limit well under way, and with its inception will be begun, the building up of what may well be called a "perpetual inventory." The securing of this information is essential, in order that the Department may be enabled to render the most material results.

Three crews of four men each will be placed in the field on this work. The crews will first survey those areas which the Woods Department intends to log in the immediate future and the information secured will be placed at the disposal of the Woods Department to be used by them by way of facilitating their work in the economic location of camps, letting of contracts

A considerable amount of exploration work will be carried on toward the end of the summer and next fall, when it is tentatively planned to place two exploring crews in the field.

During the coming open season, it is planned to carry on jointly with both the Commission of Conservation and the Entomological Branch of the Department of Agriculture, field work, along investigative lines.



ON LAKE OF BAYS, ONTARIO.

## EUROPE'S EYES ARE ON CANADA'S FORESTS

(An interview with Sir Lomer Gouin, Premier of Quebec)

"While in France and Belgium I conversed with many distinguished capitalists whose eyes are focused on Canada. Many of them expressed the intention of investing in Canada, and in the province of Quebec, and I expect to see a large influx of technical men in the near future to explore our mineral resources, and later a flow of immigration from France, Belgium and England.

"What is today causing the greatest interest in Europe is our wealth of forests. The demand for paper has become so great in France, Belgium and England that capitalists are now turning their attention to Canada for a supply. I had to answer many inquiries on this question from

capitalists who wanted to know where they could secure limits, and there are several syndicates with large capital, both in France and England, who are coming out to this province to acquire forest lands.

"I do not think," added Sir Lomer, "that it would be wise for the present to give publicity to the names of these capitalists."

"In England," continued the Premier, "I found capitalists as keen to invest in the resources of this country as were those of France and Belgium. In England there seems to be a perfect craze to come to this province for the wood that will prevent a paper famine."



The Canadian Forestry Association's Tree Planting Car, now journeying to scores of communities in the Southern prairie provinces. The interior is equipped as a motion picture auditorium with accommodation for over 100 people. Special electrical generators are carried to make the car independent of local current.

Two public meetings are held daily, and the public response, particularly of Western farmers, has been highly gratifying. The motion picture films tell a complete story of the benefits of tree belts under prairie conditions.

### DOES ORGANIZATION PAY?

*(An excerpt from a letter to the Canadian Forestry Association by Mr. Angus McLean, Vice-President of the Bathurst Lumber Co., Bathurst, N.B.)*

"There is one thing we are pleased about, and that is the way in which the general public are interesting themselves in the extinguishing of these fires and also the work of the fire fighting appliances which have been used very effectively. If it were not for the organizations that have been built up to fight this fire fiend, the loses we would be suffering at the present time would be untold."

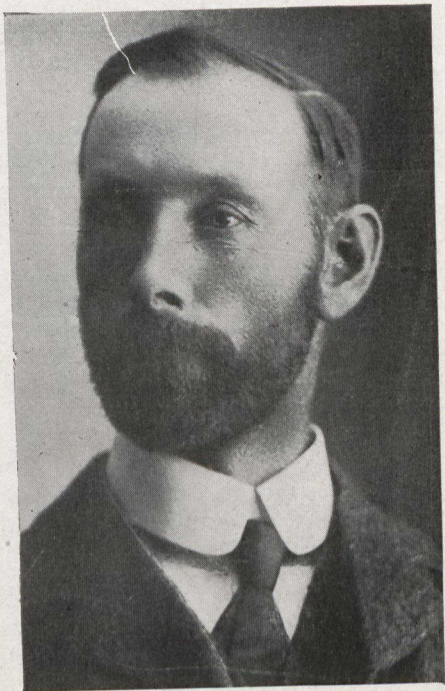
"Protect, increase, restore,

"Maintain productive timberland

"And bring content on every hand

"Now and forevermore."

*Motto of Empire State Forest Products Association.*



MR. ARCHIBALD MITCHELL,

well known throughout the prairie provinces as a tree-planting expert of 30 years experience; and a favourite lecturer.

## A Matter of Jobs

All forest fires are job-killers.

We Canadians let loose about 7,000 incipient forest fires every spring, summer and fall—7,000 volunteer job-killers. It isn't the trees that matter, but the JOBS that are tied to trees.

Undermine the Canadian Forest with Fire, and you automatically destroy a gigantic paper and pulp and lumber business with 425 million dollars and an army-corps of workmen depending on the forest's safety.

"What's my part in this?"

Just a simple thing or two:

Next time you are in the woods, build your camp fire in a safe spot; build it small; then put it out. Put it Dead Out.

Watch every atom of fire—matches and cigarettes especially—as you would in a gunpowder factory.

Nearly all terrible forest fires began inside a square inch.

### CANADIAN FORESTRY ASSOCIATION

The above represents one of a series of forest protection talks which appear on the menu cards in all the dining cars of the Canadian Pacific and Canadian National railway systems. Cards bearing the "sermonette" are clipped to the menus and are frequently replaced by new text and illustrations. The Canadian Forestry Association values highly this substantial favor on the part of the two great systems. Mr. W. A. Cooper is Manager of the Sleeping and Dining Car Department of the C.P.R., and Mr. Walter Pratt is the responsible officer of the Canadian National system.

## FORESTS OF WEST AFRICA CONTAIN 500 SPECIES

There are, on the west coast of Africa, from Liberia to the Congo, to a depth of from 50 to 300 kilometers, forests second only to those of the United States and perhaps Brazil, which are destined to supply Europe for a long period. Several firms familiar with the qualities of the timber, have in former years made attempts to market and introduce these woods. It was not until after the quality and comparative cheapness of these species were recognized that this trade commenced to grow, assisted by the improvement in woodworking tools and machinery.

Just before the war Hamburg was the most important market for West African timber. J. F. Mueller & Son, Hamburg brokers, took part in the development of this industry. The trade increased in a few years and became an economic factor. It is estimated that about 500 different species of wood grow in the West African

timber belt, but only an insignificant portion has so far found its way to market.

Much of this region is not yet sufficiently accessible and has not been investigated, and the difficulties of cutting and transporting the timber to the coast are many. In some regions the logs are cut and squared before they are brought out. Logs are rolled by native labor to the waterways. In the rainy season sudden rises in the watercourses are taken advantage of to raft the timber to the coast. In the rainy season workmen watch day and night for the opportune time to raft the logs down stream, for if an opportunity is allowed to pass, the logs sometimes lay over for a whole season.

In 1913, 115,000 tons of okume and 30,000 tons of mahogany were imported into Germany. The war brought a complete stop to this enterprise.



## Is the Forest Safe for Trees?

By Dr. C. D. Howe

Now let us turn to the cut-over lands which have not been burned since the logging operations. Surely these are safe places for trees because they have escaped destruction by fire. However, let us inquire into the situation, using as a basis the results of an investigation being carried on by the Commission of Conservation on cut-over pulpwood lands in the River Rouge and St. Maurice Valley in Quebec. The original forest in the St. Maurice Valley was dominated by white pine, scattering giant trees from three to six feet in diameter and from 100 to 500 feet high, towering 50 to 75 feet above the associated birch, maple, spruce and balsam. The region was first lumbered for pine between 60 and 70 years ago, and the lumbering was continued down to 35 years ago. Judging from the stumps still left, the number of trees ran from 5 to 30 per acre.

### A Riddance of Pines.

Today one sees only an odd pine in that region, on bluffs and ridges inaccessible to the logger; and this is a region that has yielded enormous quantities of pine logs. The trees have gone from the forest, and, more important still, they have left no young behind them to take their places. I mean, under the general forest cover. There are scattered young trees along the lake shores, in old logging roads, and in other open places, but in the deep forest I could count all the young pines I saw in two summers' work on the fingers of my two hands, and yet old pine stumps are everywhere. The forest has been treated in such a manner that the white pine has been crowded out. In order to prosper, it demands plenty of overhead light. The openings in the forest made by the removal of the pine filled in with hardwoods; by overshadowing, the latter stifled the light-needing young pine trees before they could get a

real start in life. This region has been a very unsafe place for the second generation of the pine. We do not know yet how general this condition is. We hope to know some time, as our investigations progress, but, if this condition does extend throughout the unburned old pine lands in eastern Canada, the position of the white pine becomes serious. I have already demonstrated what is happening to white pine burned. If we put its position on these two classes of areas together, that is, on the burned and unburned lands, it will be seen that the maintenance of the white pine in our forests is, indeed, at a very critical point.

### What Examination Shows.

During the past two summers the Commission's investigators of the condition of affairs on the cut-over lands have actually counted the small spruce and balsam trees on 300 acres. By the strip method a timber cruise usually covers five per cent. of the area. On this basis, our forest regeneration survey, conducted in practically the same manner as a timber cruise, represents a five per cent. cruise of 6,000 acres, or about nine square miles of cut-over lands. These areas were, as a rule cut twice in the earlier days of lumbering for spruce saw logs, since they have been cut over twice, and some of them three times, for pulpwood. Let us now turn to these cut-over lands and see if they are to remain continuously productive in terms of spruce saw-logs, or, following more closely my theme, to find if, under the present logging methods, the forest is a safe place for spruce trees.

### Areas Severely Culled

(Based in sample plots totalling 97 acres).

Spruce trees removed, per acre .....	26
Present number of spruce trees per acre:	
Seedlings (below 0.6 in. diameter at breast height) .....	422.0
0.6-3 inches diameter at breast height, inclusive .....	27.9
4-7 inches diameter at breast height, inclusive .....	19.6
8-11 inches diameter at breast height, inclusive .....	7.4
Total.....	476.9

## Our Eastern Car Now Working in Gaspé

The Canadian Forestry Association's Railway Exhibition Car (No 1), freshly equipped from end to end, and carrying its own electric generating plant, is meeting with a remarkable welcome in Eastern Quebec, south of the St. Lawrence, along the lines of the Canada and Gulf Terminal Railway and the Quebec Oriental Railway. Hearty co-operation has been given by the Southern St. Lawrence Forest Protective Association, by the various municipal authorities, parish priests, lumber companies and fire rangers. A French demonstrator and lecturer attends to the crowds during the day and lectures in local halls, at night, with the aid of motion pictures, for which the portable generator supplies electrical current.

This year the Forest Protection Car, loaned by the Canadian National Railways, was in the hands of carpenters and other workmen for several weeks in order to construct inside the car an attractive and instructive set of exhibits. Seventy electric lights, arranged in handsome plate-glass show cases and behind frames of hand-colored scenic "transparencies" contribute to a pleasing effect. The products of the forest are so arranged that most of the manufactures of pulp and many uncommon products of hardwoods are arranged and described so that any French or English visitor can grasp the argument for forest conservation. Models of look-out towers, forest telephones, wireless telegraph, etc., form one interesting section. A small

tree nursery and a graphic model of a maple sugar bush readily attract attention. A rotating "automatic stereopticon" keeps fifty lantern slides flashing on a stationary screen. On every hand, framed notices press home the argument for forest preservation. "Forest fire movies" used during the evening lectures have been found very valuable educationally.

The car will move from Gaspé into Northern New Brunswick, working through town after town of the districts presenting greatest scope for educational propaganda, then into Central Quebec for some weeks, afterwards devoting two months to Ontario.

The management of the Canadian National, Canadian Pacific, Temiskaming and Northern Ontario, Quebec Oriental, and Canada and Gulf Terminal railways have extended to the Forestry Association's enterprises the maximum of courtesy and co-operation.

FROM NEW BRUNSWICK.

Newcastle, N.B., May 11, 1920.

"Canadian Forestry Assoc.

"We feel your association is doing valuable work throughout Canada towards conservation and protection of our forests, and we trust you will continue the good work. The Forestry Journal is a very nice publication, and contains valuable information from time to time. We look forward each month to receiving our copy.

"D. & J. RITCHIE & CO."

# Municipal Council to Cover 1000 Acres of Sand With Trees

By "Ahmik," Agricultural Contributor, Toronto Globe.

The County Council of Simcoe has arranged to buy 1,000 acres of sand plains in the district north of Barrie for purposes of reforestation. This is merely a beginning. It is the intention to add to the area to be planted from time to time. It is understood that the Provincial Government will supply seedlings for planting and do the work of planting free of cost. The work of caring for the seedlings, after planting, will also be undertaken by the province, but the cost of this will be charged against the county. When the trees mature these, as well as the land, will be the property of the county.

This is the most practical method by which a policy of reforestation in older Ontario can be carried out. It is a co-operative method; it unites the interest of two public bodies, one local and the other general, for common benefit.

The site selected for the beginning of what should be a great province-wide development is, too, admirably chosen. The soil is a sandy waste, wholly unsuitable for agricultural purposes, but admirably adapted for the growing of pine. In fact, it was once covered with pine.

But the sand plains north of Barrie do not furnish the only location where such work as is proposed in Simcoe county can be advantageously carried out. In a recent trip through Durham county, in connection with the Scriven memorial service, Premier Drury saw a somewhat similar location in the sandy ridges paralleling Lake Ontario. In addresses at Milbrook and Omeme, the Premier suggested the application to this section of the policy being applied in his own county of Simcoe.

To Simcoe will go the honor of being the pioneer in actual work of reforesting the waste lands of the province. It will be no small honor if Durham takes second place in the line. And the Farmers' Government of Ontario could leave no more fitting and lasting memorial of its term in office than a number of Pro-

vincial-county forests scattered all over the Province.

To the whole Province, as an almost immediate effect of such work, would come benefits in the form of effect on climatic conditions and water supply. To Province and counties would come eventual profits from the timber created. A three-quarter-acre block of second growth pine, seventy years old, in Simcoe county, recently sold at a price that represented an annual rental during the period of growth of \$7 per acre—more than the rental value of good agricultural land. And that is only part of it. Such forest plantations as proposed may in time be made the means of forming the centres of industries that will afford a good livelihood where a proper living cannot be made by attempts at using sand plains or sand hills for agricultural purposes.

The ball is off. Keep it moving.

## SASKATOON TO THE FORE!

This season has already seen an unprecedented demand on the part of the citizens of Saskatoon, for shrubbery and small trees for planting purposes, states the city gardener. Plans are under way in the city to cope with the greatly increased demand, and this year there will be more than 200,000 trees and shrubs planted at the city greenery.

Cuttings which are planted this year consist of poplar, honeysuckle, lilacs and willows, and judging from results on a small scale in the past, this will soon grow to a matter of primary interest in Saskatoon, where the love of beautiful homes has grown rapidly during the past year or two.

In addition to this the parks board has purchased large quantities of elm trees and caranganas. These will be cultivated with special care, as well as distributed to the citizens who wish to purchase. They are being handled at the cost price, the aim of the board being to clear expenses and beautify the city at all events.

## What the Boys Can Do!

(A graphic letter from a member of our Speakers' Bureau.)

Perth, N.B., June 7th, 1920.

Secretary, Canadian Forestry  
Association:

In accordance with arrangement I

have been able to conduct one meeting in the Perth School. As you no doubt are aware, fires have been raging through this Province for more



### THEY'LL DECIDE OUR FOREST POLICIES IN A FEW YEARS.

Five boys who fought forest fires near Perth, New Brunswick, for 48 hours without quitting. Read Mr. Manly Craig's letter printed herewith.

From left to right (standing): Harry Sisson, age 13; Wilfred Pelton, age 12; Harold Grant, age 12; (sitting, left to right) Vernon Dickison, age 15; Albert Lewis, age 9, all members of Ando-Perth Cadets.

than two weeks beginning about the 10th of May, and we, in this section have been among the "hard hit," the whole population having suffered more or less as a result of the great forest fires, and which we have been fighting with determined effort, but by reason of the tinder like condition of the slashings were unable to make much headway in beating back the enemy.

Out of the 350,000 people in this Province, there were a few, just a few individuals, who, through carelessness, have caused a destruction of nearly \$2,000,000.00. There is, too, every reason to believe that a few persons have stooped low enough to touch a match to our forests. It does seem to be like a drop in a bucket towards the total eradication of this evil, when it is realized that perhaps less than a dozen persons out of the whole population are able to so place themselves on the side of the most destructive enemy-fire.

\$30,000 worth of valuable timber and lands have been destroyed here at Perth, and some one person is guilty,

for the fire which appears to have been set by a culprit (though not yet apprehended) has covered an area of 8,000 acres.

I had the pleasure of talking to about fifty of the boys and girls in the Perth School on Friday, May 28th, and must say that I never met a more appreciative audience. They seemed to drink down every word, for most of them had just passed through the fire fighting experience in the forests here, and were eager listeners for anything touching upon this subject. I am sure that not one of these boys and girls will ever forget the meeting. In conversation with some of the parents after the lecture, I was informed that the children carried news to them which they had never before heard of. One of the boys, age ten years told his father the whole story, and one of the things he became most interested in was the age of a tree and how to find it. Others were more interested in the great destructive fires of

## A Striking Bargain in Nature Books

The Canadian Forestry Journal will clear out its remaining edition of three notable

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at prices impossible to find in the bookstores. Write in at once, enclosing money order, as the number of books is very limited.

"The Tree Guide," by J. E. Rogers, a noted authority, with 265 illustrations, 32 of them in natural colors. This book has had a wide international sale. It is made in a handy size for the pocket, with leatherette covers, gold stamping, fine paper, and the price is \$1.00, post free.

"The Animal Guide," by Chas. K. Reed, an authoritative and entertaining writer. The size is identical with "The Tree Guide," and it contains 60 colored illustrations. The covers are fibre, and every page and picture is made interesting. The subject matter covers the wild animals of North America. Price, 70 cents, post free.

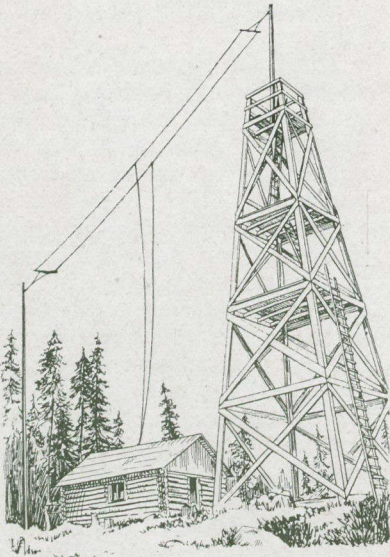
"Game Birds," a well-known book of 65 pages, with pictures on every page in quadri-color. The descriptions are non-technical, and no finer illustrations have appeared anywhere. Price, 40 cents, post free.

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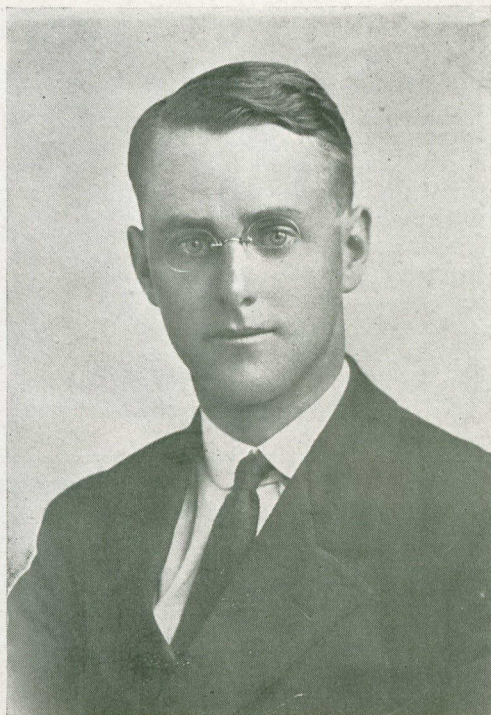
the past, and as I had personal experience through the great Hinkley fire of Minnesota, was able to picture to them some of the devastating scenes caused by Forest fires.

At the close of the lecture which occupied twenty-five minutes, I asked all to stand who would pledge themselves to enter now into battle against the great enemy, and every one in the room answered to the call. This, in my opinion, is the only successful method of combatting the forest fires in our Canada. These boys and girls will, in just a few more years assume the responsibilities we are now assuming, but if they are enlisted now, they will be able to perform their services to our country better than we have ever done. The world conditions, and the warning given by Sir Auckland Geddes to the graduating class at the George Washington University on May 31 is worthy of consideration, for the very high ideals of civilization depend upon the three essentials which he mentioned to be kept in view: "Duty, Service and Truth." And so I believe that now is the time to plant in the minds of the boys and girls of Canada, these three great essentials for the protection of civilization. I am herewith handing you a photograph of five of the boys who fought fire for forty-eight hours here at Perth a few days ago. These boys deserve special mention, and I am going to see that the Country will know of them; they will soon be men, and I feel sure that these five can be depended upon to fight forest fires or any other kind of a fire, or any kind of a battle for the protection of civilization and our country.

Sincerely yours,  
MANLY H. CRAIG.

#### DYNAMITE IN BUSH FIRE

Elk Lake, Ont., becoming panicky, when their boat encountered a bush fire at a portage, because there were twenty cases of dynamite aboard, employees of the Thesaurus Gold Mines abandoned their craft and the entire provision supplies of the mine, machinery and gasoline boat were destroyed.



MR. G. GERALD BLYTH,

Recently appointed Assistant Secretary of the Canadian Forestry Association. Mr. Blyth saw much active service with the British naval forces during nearly the whole of the war. Recently he has occupied the post of Supervisor of Timber and Fire Protection in the Dominion Parks Branch, Ottawa.

ed. Though the bush fire exploded the dynamite, a ton in all, not a soul was injured.

The fire, which destroyed a large area, started north of Matchewan Gold Mines and traveled to the lake in three hours. It frightened the Indians, who assisted the Hudson Bay factor to bury the fur in stock and the whole lot fled down the river to Elk Lake. It turned out that the post escaped and the fire died out when the wind changed.

#### BIG FARMS TO BE FIRE CLEARED

(Prince Albert Herald)

C. McFayden, inspector of forest reserves, last week visited the Porcupine area, where preparations are well advanced for the clearing by fire of two large areas. Fire guards have

been made around one area northeast of the Copeau river, about half a township in extent, and one bordering McDonald creek about a township in extent. Surveyor Christie is superintending the work of the Copeau River area and Surveyor Cummings the other. It is expected that the big fires will be started in about a week.

As to the Porcupine for a place of settlement. Mr. McFayden states that he was surprised to find how much better the soil was than he had been led to expect. The rich black loam is ideal for farming, and he believes that settlement will be rapid.

New soldier settlers are already going in to locate or to take up land already allotted to them.

### HOSIERY FROM WOOD

In 1914 American manufacturers produced 300,000 pounds of artificial silk made from cellulose, largely wood cellulose. The production in 1918 was approximately 13,000,000 pounds. Imports of artificial silk in 1914 were over \$4,000,000 and are now only about one-fourth of that sum. It is now being used to advantage in fabric mixtures with natural silk and wool, but its chief market is in the form of hosiery.

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## Winning the Children by Our Speakers' Bureau

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 "I delivered the first address and am now arranging to take in as many of the other schools as possible. I consider the first manuscript excellent and difficult to improve upon."

C. J. OSMAN.

Cobalt, Ont.  
 "I should be pleased, indeed, to receive your second lecture on Forestry at your earliest convenience. The pupils and teachers were delighted with your first lecture."  
 A. E. BRYSON, Principal,  
 Cobalt Public School.

Matheson, Ont.  
 "We have been at the school this morning and made arrangements with the principal for Mr. Barlow to address the pupils from time to time. Mr. Barlow will give his first address on May 25th."

D. CHALMERS.  
 Magnetawan, Ont.

"According to arrangements, I addressed the senior classes of the public school here on May 20th. The teacher was quite interested and the pupils were attentive."

ANGUS ROSS.  
 Marmora, Ont.

"On May 21st, I delivered the address which you sent me to the senior pupils of the Public School here. The pupils gave a very attentive hearing and the principal expressed his warm approval of the lecture."

"I feel sure you are doing a splendid work in reaching the young people in this way."

F. S. PEARCE.

The foregoing are typical of the hearty reception accorded by the schools of Canada to the Canadian Forestry Association's most recent enterprise, the Speakers' Bureau. In this work, several hundred public spirited Canadians have volunteered to do a vital service to forest conservation by acting as local speakers. The appreciation of all members of the Canadian Forestry Association is due those who have not hesitated to tax their time and energy to cultivate a more intelligent concern for the nation's forests.

Any member of the Association who has an opportunity to make use of a lecture manuscript is invited to send in his name. Every town and village in the Dominion should have the benefit of these entertaining juvenile lectures.

"This work is vital to our national welfare and should be extended," writes a school principal, Mr. F. T. Fowler, in Seaforth, Ont.

"I shall appear before the County Grammar School of this town Superior School of West Bathurst, as well as the large schools of South Bathurst and West Bathurst during the remainder of May and perhaps some of the more remote schools as well," writes one of our hearty eastern friends, Mr. J. L. Ryan, Barrister of Bathurst, New Brunswick, who adds: "I have gone over your Special Talk and am greatly pleased with same."

"The trustees have arranged to have me address the children on Friday next and I will also take steps to present this paper before some other meetings whenever possible," writes another strong Association friend, Mr. F. A. Fisher, President of the Enterprise Foundry Co., Sackville, N.B.

"I am arranging a big picnic for Victoria Day," writes Mr. D. R. P. Coats, of Kipawa, Quebec, "and my Boy Scouts will lead in fixing sports for the kiddies. I will have all the children sit down for a quarter of an hour and listen to a little speech into which I will work the Empire idea and specially Canada and her vast forests which must be protected."

These are typical of the whole-hearted co-operation given by members of our Speakers' Bureau in every part of Canada.

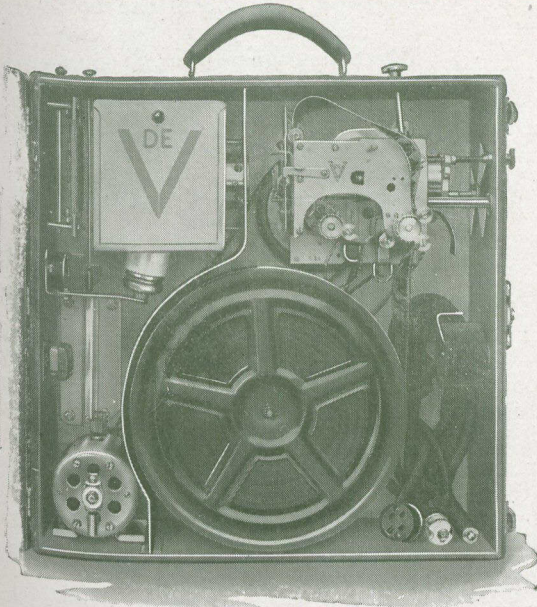
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### *What Public Ownership of Forests Means in Canada*

Crown lands, including timber lands, in Canada are administered in most cases by the provinces in which they are situated. In the three prairie provinces (Manitoba, Saskatchewan, and Alberta), in the railway belt (a strip twenty miles on each side of the Canadian Pacific Railway's main line through British Columbia) and in the Peace River block in northern British Columbia the crown lands are administered by the Dominion Government. In this area there are few privately owned timber lands other than farmers' woodlots. Rights to cut timber are granted but the title of the land remains in the Crown. In Nova Scotia the greater part of the timber land has passed into private ownership. In New Brunswick over seven thousand square

miles of forest land is owned outright by railway companies and other private concerns or individuals. In Quebec about six million acres have been so disposed of and in Ontario about five million acres. The policy of retaining the title to all timber lands has been largely followed in the Province of British Columbia in the area under provincial control as well as in the federal areas. About 2,000 square miles of timber land is in private ownership.

The ownership of forests by towns and communities, so common in Europe, is almost unknown in Canada, although efforts are being made to encourage the establishment and maintenance of forests of this nature.

## A NEW GAME SANCTUARY

Acting on the petition of the property holders interested, a substantial tract of land and water in the vicinity of Arnprior, Ontario, has been created a game sanctuary by the Ontario Government. This piece of country is splendidly adapted for a refuge for game, as very little of it is cultivated, and a large part of it is covered with thick woods, which suggested the name chosen for the sanctuary, Nopiming being an Indian word meaning literally "in the woods."

The effect of this action on the part of the Government prohibits, under heavy penalties, the capturing or killing anywhere inside the aforementioned bounds at any time of the year by shooting, poisoning or trapping or in any other manner, of any wild animal or bird that is in any way protected by law.

The property holders assert that their action in this matter has not been prompted by any selfish motive, as they themselves are also bound by the act's provisions, and have no more right to

shoot or trap within the boundaries of the sanctuary than has any outsider. What they wish to do, is to establish for their own pleasure and that of everyone who cares to visit it, a natural zoological park where the birds and animals that once were so plentiful in that part of the country, may be found again in their wild state.

## ONTARIO'S ROAD TREES

By one of the amendments to the Highway Act the department is given the right to plant trees and carry out a system of reforestation in corners or spaces of road allowances which otherwise would grow up wild and unkempt. Hon. F. C. Biggs thought this would be of practical as well as ornamental value to the Province.

## PLANTING IN THE WEST

(Ameroid, Sask., Magnet.)

A. H. Norton has received a consignment of trees from the Indian Head Experimental Farm, which he has since planted for a windbreak on the north and west sides of his farm buildings.

# TIMBER LIMITS



We have a complete up-to-date survey of all available properties in the Provinces of Quebec, New Brunswick, Nova Scotia and British Columbia. Before investing in timber limits consult us. Reliable surveys and estimates procured. We have in hand practical lumber and pulpwood limits.



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Telephone: Main 3281.

The shipment included 125 caraganas, 600 Russian poplars, 300 ash, and 250 each of wilows and Manitoba maples.

It is regrettable that the custom of tree-planting is not more general both in town and country. The absence of trees is one of the glaring defects of this district and should be overcome as speedily as possible. The Dominion experimental farm supplies the trees free of charge, the only expense being the express charges.

Any man or woman, or even a child, can plant a tree, and thus leave behind them a pleasant memorial and proof that they once existed on this earth, and that while here they contributed to making the country more beautiful. Plant trees!

**U.S. LOST FIVE-SIXTHS OF ORIGINAL FORESTS.**

(*N.Y. Evening Post.*)

In his report to the Senate on the cause of the high cost of lumber Secretary Meredith of the U.S. Department of Agriculture wanted to show that we

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have been treating our forests badly and he used striking facts to prove it. Five-sixths of the virgin forests of the United States have disappeared. Only one-eighth of New England's timber remains. New York manufactures only one-tenth of the lumber required in the State. Pennsylvania's lumber cut is less than the amount consumed in the Pittsburgh district alone. We are using lumber four times as fast as we are growing it. Two-thirds of the timber left is west of the great plains, one-half in the three Pacific coast States.

But Mr. Meredith does not mean that the situation is so serious as these facts might suggest. His purpose is to drive home the lesson that scarcity has not resulted from the use of forests but from their devastation, from our failure while drawing on our reservoirs of virgin timber to use our timber growing land. "We cannot afford," he remarks, "to cut our use of lumber down to the level of European countries, where lumber is an imported luxury. We must produce the great bulk of the timber which we need, and we have the resources for doing so."

#### ADVERTISING AND PULP.

A prominent New York publisher, in an address to the Cleveland Advertising Club, said that if the growth in advertising which has taken place during the past two years were continued, in 10 years the United States and Canada would have depleted the forests of America.

#### WOODS MANAGER WANTED.

"Wanted, Manager for woods operations by Pulp and Paper Mill using 35,000 cords pulpwood annually. Must be experienced and able to take full charge of operations. Apply, stating experience and salary required, to D. P. Company, care of Canadian Forestry Journal."

### The FOX Seven Pound Portable Typewriter



A portable machine that will do all that a high-priced typewriter will do, and at the same time light and compact enough to carry easily. Will answer the writing requirements of almost any individual or firm.

Write for Descriptive Circular.

Price in Case  
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Manufacturers of Tents of all descriptions.  
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Timber Estimating and Mapping  
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**ATTENTION!** Fire Equipment, Limited, is a manufacturing concern, not jobbers.

We have all kinds of fire fighting appliances for bush fires, such as pumps, hose, nozzles, etc.

Investigate our goods and prices and be convinced that we offer the best  
Send for samples and catalogues.

## FIRE EQUIPMENT LIMITED

244 Notre Dame Street West : : : Montreal.

## Does a Shelter Belt Pay in Dollars?

By Carlos G. Bates, U.S. Forest Service

*Windbreaks are, in more ways than one, a farm asset. They tend to prevent the soil from drying out quickly and they protect grain and orchards from mechanical injury by the wind. A belt of trees by the farm buildings protects them from extreme winter cold and summer heat, and makes the farm a pleasanter place in which to live. The windbreak may also be a source of wood supply for use on the farm or for sale.*

The effect of a windbreak on crops is not beneficial in every respect. There are certain ways in which it is plainly injurious. Trees in a windbreak always spread their roots extensively into the adjoining fields in search of moisture; and they take not only the moisture but some of the nitrogen content of the soil. Furthermore, by shading the ground they may prevent crops from developing properly.

Whether the total effect of a windbreak is good or bad depends upon whether the benefits derived from its

influence on wind movement, temperature, and evaporation are greater or less than the injury resulting from the sapping and shading of the ground near them. To determine the total effect, crop measurements have been made in Nebraska, Kansas, Iowa, and Minnesota. Average rather than exceptional conditions were measured, the object being to discover the effect of those influences which are continuous and affect every annual crop grown.

Measurements made in fields of small grain indicate that the crop gain

FIRE HOSE FIRE DEPARTMENT SUPPLIES  
FIRE EXTINGUISHERS GENERAL RUBBER GOODS

### LINEN HOSE FOR FOREST FIRE FIGHTING.

Having supplied a number of the Forest Protective Associations, we are thoroughly familiar with the specifications of their requirements for fighting forest fires, and carry in stock, and are prepared to furnish such equipment on short notice.

## THE CANADIAN FIRE HOSE COMPANY, LTD.

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REPRESENTATIVE FOR PROVINCE OF QUEBEC FOR  
AMERICAN-LAFRANCE FIRE ENGINE CO. OF CANADA, LTD.

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Is the peer of any composition roofing made.

It has a proud record of service, covering more than a quarter of a century.

On many a roof the limit of its endurance has not yet been found after more than twenty years of duty.

Inborn quality, from the surface to the centre, is what gives RUBER-OID its character.

We would suggest you consider this, for your own benefit, when planning to purchase a roof covering for that new or old building.

## THE STANDARD PAINT COMPANY OF CANADA, LTD.

52 Victoria Square : : : : MONTREAL, QUE.

in the protected zone is sufficient to offset fully the effects of shading and sapping. In a wheat field protected by a dense windbreak the grain amounted to about 10 bushels per acre where the protection was most complete, and gradually grew less as the distance from the windbreak increased. The total gain was about equal to the amount of grain which could

have been grown on the shaded ground near the trees. The season in which the measurements were taken was not of high winds, nor did it lack moisture. It would appear, therefore, that in a windy year when evaporation was high the total gain for the field would be much more than balance the loss. In another case, barley on the south of an ash and honey locust windbreak

### “Canoes that have made Maps and History.”

EXPLORERS, TRADERS AND TRAPPERS HAVE KNOWN THE QUALITY OF LAKEFIELD CANOES FOR OVER FIFTY YEARS

When Canadian forests were in their pristine glory and when the canoe was the chief means of wilderness transportation, THE LAKEFIELD CANOE was being made and sold. We build Canoes and Boats for every known purpose and have several models with different sizes in each for every possible requirement.

Write for Catalogue. It is free.

THE LAKEFIELD CANOE & BOAT CO., LTD.  
LAKEFIELD ONTARIO CANADA

Mention the Forestry Journal for your identification.



The background of the advertisement is a detailed woodcut-style illustration of a forest fire. On the left, a large, dark plume of smoke rises from a fire. In the center, a fire pump is shown with a hose extending across a field towards a fire. A person is visible near the hose. In the foreground, a large, detailed illustration of the Fairbanks-Morse fire fighting pump is shown, featuring a flywheel, various pipes, and a hose. The pump is mounted on a base. The overall scene is set against a background of horizontal lines, suggesting a sky or a distant landscape. A bird is flying in the upper left, and a small figure is visible in the upper right.

## FAIRBANKS-MORSE FIRE FIGHTING PUMP

These outfits are replacing many men and doing work impossible by any other method.

*Send for Information.*

THE CANADIAN  
FAIRBANKS-MORSE  
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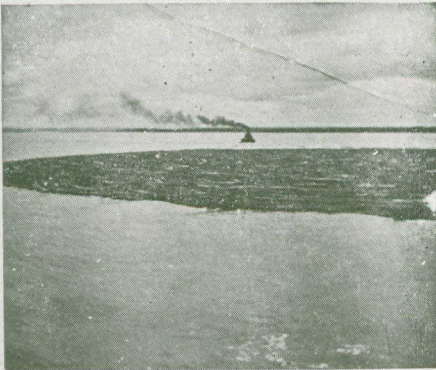
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Every large  
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benefited very materially from the accumulation of snow in the lee, and the conservation of this moisture. Here cultivation was possible within 4 feet of the stems of the trees, so that the increased yield of the field, amounting to about 14 bushels per acre at the highest point, was practically clear gain. The total gain for the whole field amounted to the yield of a strip of ground as long as the windbreak, and three times as wide as its height. In other words had the windbreak, which was 20 feet high, occupied a strip of ground 60 feet wide, the gain in the field crop would have paid the rental on all of this ground.

The corn crops showed more consistent and marked benefits from protection than any others. In the region concerned the summer winds are almost wholly from the south, so that

## LUMBERMEN ATTENTION!



Cut shows tug crossing Bay Chaleur with over 2,000,000 in tow. Distance 35 miles.

Investigate our new patented towing and holding boom. Will save its cost many times over in preventing logs going adrift while being towed in open water, or for booming swift running rivers where logs are held.

**A. E. LOOSEN,**  
**BATHURST NEW BRUNSWICK**

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the only effective rows and belts extended in an east-west direction. The effect on corn was very marked for a short distance on the south side of such windbreaks and for a much greater distance on the north side. Fields of young corn showed much better growth in the area protected and warmed by the windbreak. The effect was visible to the eye early in the season, which was rather cool. Height measurements on one field showed the plants to be  $4\frac{1}{2}$  feet high in the first 18 rows next to the windbreak, while beyond this protected zone the height was only  $2\frac{1}{2}$  feet. This luxuriant growth was still in evidence at the end of the season, and not only produced more fodder, but bigger and heavier ears. The field showed a production of 59 bushels to the acre in the protected part and only 41 bushels in the exposed part. The net gain, including the area shaded by the grove, was equivalent to the yield of a strip twice as wide as the height of the trees, which were 38 feet high. The increased yield paid, then, for a strip 76 feet wide. The windbreak happened to be wider than this, but need not have been to afford the same amount of protection.

### WANTED

150 lbs. White Spruce Seed  
(*Picea Canadensis*)

**LINCOLN WOOD PULPCO.**  
Box 923 BANGOR, MAINE

**TREES, SHRUBS and SEEDS**

HARDY NORTHERN TREE STOCK

**EDYE-DE-HURST & SON, DENNYHURST**  
DRYDEN, ONT.

Shippers to H.M. Government.

With ordinary field crops the farmer may count on a benefit from windbreak protection which will make the loss of the area occupied by the trees negligible. Under Middle Western conditions a windbreak whose width does not exceed two or three times its height will more than pay for itself, regardless of the timber which it may produce. Farther east the same kind of influence and benefit will exist, though in a less marked degree, and a greater direct return may be expected from growing the timber for its own value, so that the need of even a slight amount of protection should make windbreak planting attractive.


In any region the windbreak should be so laid out as to offer the greatest resistance to damaging winds and to protect the greatest area. This simply means having the belt or row at right angles to the prevailing winds. In addition to affording protection to crops and buildings, the windbreak usually has considerable value as a source of wood supply for use on the farm or for sale. In the following

estimates of the timber value of various kinds of windbreaks the acreage on which the figures are based includes not only the ground actually occupied by the trees but also that

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**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.



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July and August. December to April

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THAT WILL JUST SUIT

YOU ASK FOR

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AND GET AFTER HIM.

**Put Out Your Camp Fire;  
Never Toss Away a Lighted Cigarette.**

There are hundreds of jobs in a live forest.  
Dead forests drive out population.

This advertisement inserted in the interests of forest protection by The  
**SPANISH RIVER PULP & PAPER MILLS, LTD.**  
Sault Ste. Marie, Canada.

which is shaded and sapped. The estimates are for annual income per acre, discounted at the rate of 4 per cent from the final value of the timber when cut. No allowance is made for the cost of planting.

Cottonwood rows and narrow belts planted in fairly moist bottom lands yield an income of from \$2.64 to \$8.01 per acre, the greatest values being obtained by cutting after the age of 40 years. Good returns can not be expected from any but moist situations.

Willow planted on thoroughly moist soil yields from \$4.17 to \$15.81 worth of posts per acre, the highest values being realized when cutting is done between the ages of 14 and 20 years. When utilized for fuel, willow yields an income of from 72 cents to \$2.78.

Green ash yields from \$2.53 to \$6.51 in posts on the best class of soils, and from \$1.84 upward on poorer soils. It is an excellent auxiliary to cottonwood, but will make good growth on much more unfavorable situations.

RE, PROF. MacPHAIL'S SPEECH  
Editor, Canadian Forestry Journal:

Referring to the recent address of Professor MacPhail which you dealt

with in the last issue of the "Journal" it may be interesting to recall the words of Mr. G. K. Chesterton, which will be found at Page 56 of his entertaining little book on Blake:

"The trouble with the expert is never that he is not a man; it is always that wherever he is not an expert he is too much of an ordinary man. Wherever he is not exceptionally learned, he is quite casually ignorant. This is the great fallacy in the case of what is called the impartiality of men of science. If scientific men had no ideas beyond their scientific work it might be all very well; that is to say, all very well for everybody except them. But the truth is that beyond their scientific ideas, they have, not the absence of ideas, but the presence of the most vulgar and sentimental ideas that happen to be common to their social clique. If a biologist had no views on art or morals, it might be all very well. The truth is that a biologist has all the wrong ideas of art and morals that happen to be going about in the smart set in his time."



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