

A black and white photograph of a massive tree trunk, showing its deeply furrowed bark. A young boy in a light-colored shirt and dark tie stands at the base of the tree, his hands on his hips, to provide a sense of scale. The background is filled with the dense foliage of a forest.

# Canadian Forestry Journal

January, 1917.



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# Canadian Forestry Journal

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THE CANADIAN FORESTRY JOURNAL  
119 BOOTH BUILDING, OTTAWA



# BETTER APPARATUS FOR FOREST FIRE FIGHTING

## Some Results of the First Year's Experience with Portable Pump Under Practical Conditions

*By H. C. Johnson, Fire Inspector, Board of Railway Commissioners for Canada.*

The writer endeavored in the January, 1916, issue of this journal to give a description and explain the proposed manner of using a system of portable gasoline pumping units designed by him and built for the Dominion Parks Branch for service in the Dominion Parks of Canada to be employed in forest fire fighting. These fire fighting units are also used for the controlling of certain operations carried on in the forest in which fire is used such as slash burning and back firing. Earlier theories in connection with the introduction of these units have now been put into practice and actual results have been obtained.

The first unit was built and put into service during the summer of 1915. It was used to control slash burning operations in the Rocky Mountains Park and proved very efficient in this work, enabling burning operations to be safely carried out in very dry weather and complete control of the whole situation maintained.

During the fire season of 1916 six units were put into service in the Dominion Parks, two units were put into service by the St. Maurice Forest Protective Association in the Province of Quebec and several units were also put into service in other parts of Canada and the United States. Many inquiries from all over the continent were received and, strangely, the majority of these came from private owners of forested lands, which would indicate that private owners of such property are wide awake to the possible destruction

of their timber by fire and are anxious to provide up-to-date protection.

### *Put To The Test.*

One of the claims made for this type of power pumping apparatus was that it could be transported practically anywhere or to any point where a man or pack horse could go. During the past fire season this has been confirmed and put into practice by the Dominion Parks Branch in the Rocky Mountains Park and the St. Maurice Forest Protective Association in Quebec. The photographic illustrations shown here well illustrate the various methods used by the Dominion Parks Branch to transport these pumping units. View (1) shows several pumping units together with hose and auxiliary supply of gasoline being transported in a Ford truck along the main highway. View (2) shows two pack horses being used to transport two units, one horse carrying two engines and pumps and a second horse carrying the hose and auxiliary supply of gasoline. View (3) gives a good idea of the manner in which power canoes can be utilized to move the outfits from point to point on lakes and rivers. View (4) shows how on railway lines track motor cars are used to carry the outfits to a point nearest the scene of a fire. View (5) shows the method of transporting the engine and pump by two men; slings from the stretcher handles pass over the men's shoulders which enable the men to let go of the handles, if necessary, when passing through rough country or climbing. These five views show





THE FIRE PUMP IN ACTUAL USE.

1. Automobile Transportation.
2. Two pumping outfits carried by two pack horses.
3. Readily transported in canoes, skiffs or launches.
4. Track motors are used to carry units along railway lines.

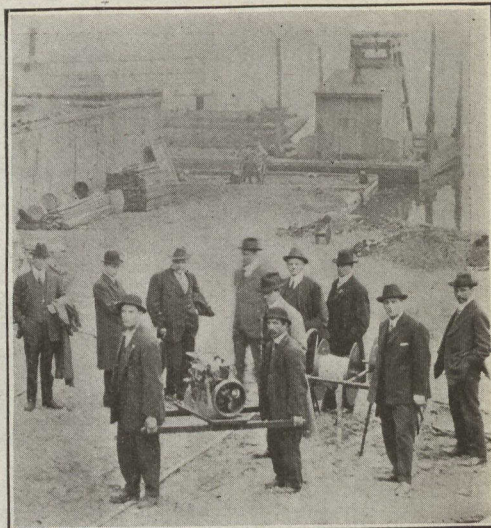


five different methods of transporting the units. In addition to these methods, a specially designed light truck on two wheels to be hauled either by hand or by horse, has been designed and built and a view of this truck appears in the January, 1916, issue of this Journal. Along roads where it is possible for horse drawn vehicles to go, such method of transportation can also be used.

#### *Fighting Fires in Quebec.*

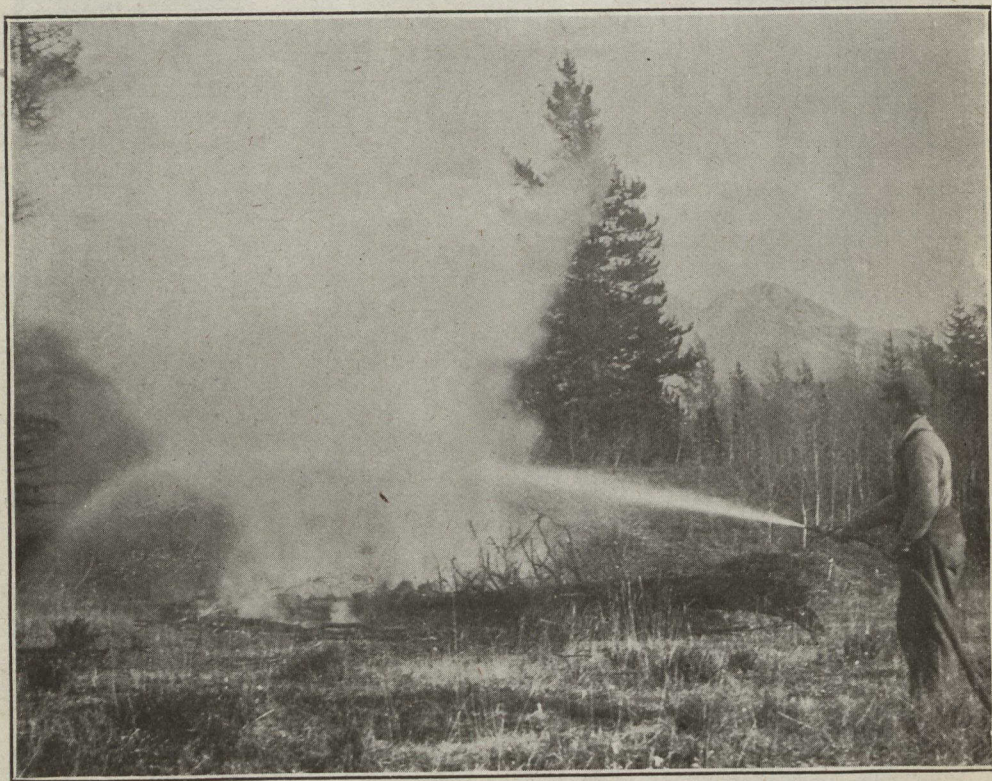
Another theory advanced was that such apparatus could be used to actually fight a forest fire. This theory has been put into practice and judging from the following extract from a letter received from Mr. Henry Sorgius, Manager of the St. Maurice Forest Protective Association proved very successful:

“During the past season we used the pumping outfit at four different forest fires and it has more than made up for its cost



Method of carrying fire pump by two men.

in the saving of fire-fighters' wages and timber saved. On two occasions we used the pump for three days, each time from 3 a.m. until 11 p.m. only stop-



AT THE DISCHARGE END OF THE HOSE LINE



ping when changing it from place to place. We also used it to extinguish two other small fires.

"We generally transport the apparatus on our motor speeder to the point nearest the fire, then the rest of the route is covered by canoe or by men on foot along the portages. The pump was a grand success."

This particular type of apparatus and manner of employing same is a decided departure from anything that has been previously attempted, and so far as the writer is able to ascertain no forest organization in Canada or the United States have yet brought forward a portable pumping apparatus, that for portability, compactness and efficiency, can approach the apparatus under discussion.

The field in which the internal combustion engine can be utilized in connecting it up to pumping apparatus for use in the forest is very wide and in working out a scheme of forest fire protection in which such pumping apparatus is proposed to be used, is not limited by any means to the portable units under discussion. Larger outfits can be used, pumping more water per given time, at a greater pressure and through a longer length of hose line. Such outfits would be less portable and in consequence could only be used along the main routes of travel such as roads, railways, lakes and rivers. To secure this, a different type of pump and method of connecting same up to the engine will have to be adopted. This scheme is already under development and it is proposed to employ larger and heavier outfits along valley bottoms and by using three to four thousand feet of hose deliver water back into the higher territory and then use the present lighter and more portable units from that point on into the rougher ground behind.

**Fires on St. Maurice**

In the territory of the St. Maurice Forest Protective Association in 1916, 200 fires for the season were caused as follows:

Settlers	00	
Railways	77	38½%
Laborers	28	14%

Lightning	17	8½%
Fishermen	12	6%
Unknown	51	25½%
Berrypickers	8	4%
Jobbers	2	1%
Portagers	1	½%
Explorers	2	1%
Trappers	1	½%
Smudge	1	¼%

**200 Fires**

The cost of extinguishing fires in 1914 was \$13,004.32; in 1915, \$7,329.-47 and in 1916 \$2,759.71, thereby showing progress made in patrol efficiency.



Pumping from a small creek in the Rocky Mountains Park.



# CANADA'S WHITE PINE POSSESSIONS ARE THREATENED WITH EXTERMINATION

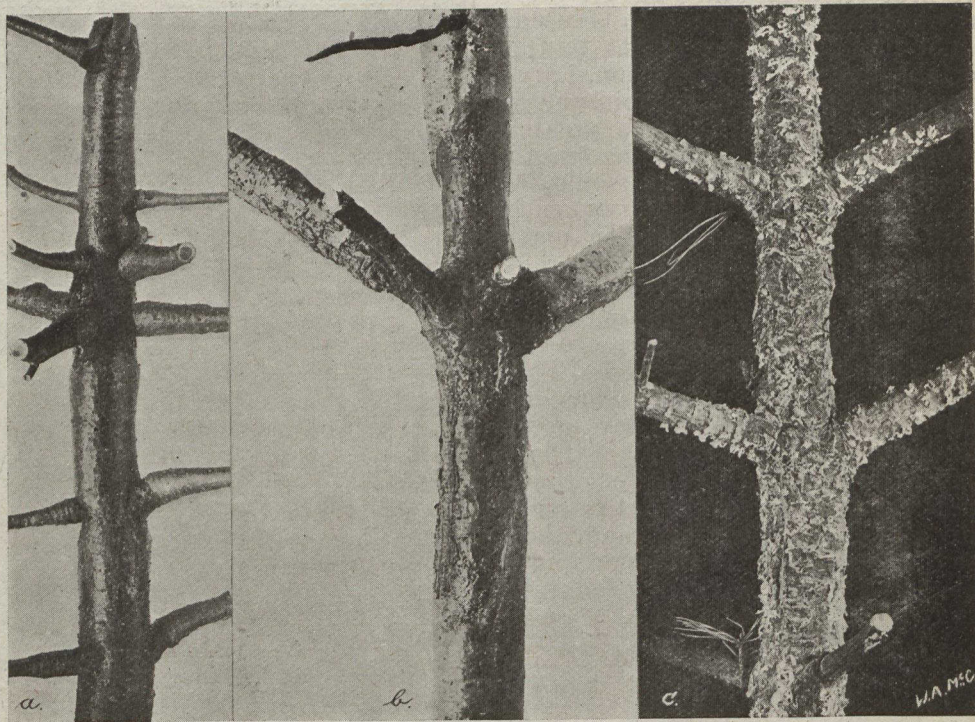
## An Authoritative Discussion of White Pine Blister Rust

Written by H. T. Gussow, Dominion Botanist, Ottawa.

The Forest resources of the Dominion of Canada, it has been said, are inexhaustible. This statement, on careful inquiry, may need some modification. The forest wealth of Canada undoubtedly is inexhaustible as far as the present generation is concerned it will be found ample yet for many more generations. We must however, bear in mind the wonderful

opportunities Canada offers for settlement. With an increased population such as Canada requires to develop its natural resources to the fullest degree the demands on the Dominion forest resources will increase simultaneously, very probably in an increasing ratio.

We are, as a nation, so convinced of this great forest wealth that little



White Pine Blister Rust

Photos by W. A. McCubbin

- (a) Early stage of white pine blister rust showing typical swelling.
- (b) Branch of white pine completely girdled by disease.
- (c) Appearance of infected white pine during May and June.



thought is given by the general public that things may be different some day; and unless we carefully husband our resources, the time may come, when it will be realized that Canada's forest wealth is giving out.

A word of warning is intended to be sounded in this article,—a word of very earnest and serious warning. At the present moment, if one be asked which forest trees are the most important in Canada, one would unhesitatingly reply, the Pines—the White Pine proper and Western White Pine.

Are you aware that a white pine forest in Northern Europe is a thing of the past? The White Pine, from its original home in America was quickly introduced into Europe, because of its great commercial usefulness. But now there is no White

Pine to speak of; it has been replaced by an inferior pine. Why? A fungous disease is to blame. It appeared, worked for years in silence, nobody suspected anything wrong, and then trees began dying here and there—slowly at first, rapidly later on. Then the eyes of the people were opened too late, far too late, the disease was so firmly established. Then the governments realized the position, and planted trees not subject to this disease. They fought the disease; but like a vast fire the epidemic was beyond control. They could do naught but look on. Steps were taken to study the disease; but it took years before the cause became known; and, before it could be fought, the white pines had succumbed. The Disease referred to was the *White Pine Blister Rust*.

#### A DESTRUCTIVE PINE DISEASE IMPORTED FROM EUROPE

This disease was unknown in the continent of America; at any rate, if it did exist in early times, it cannot have been a virulent or destructive disease. When the white pine was introduced into Europe, the Blister Rust, which, before this time, must have been present somewhere,—some say in Eastern Europe or Serbia—found a very suitable host, and repaid hospitality by killing its host. There existed in European countries great tracts of land suitable for the raising of pine seedlings. Millions and millions were raised in Europe, few for their own use, but mainly for export, for export, curious as it may seem, to their native haunt the continent of America. Had one but

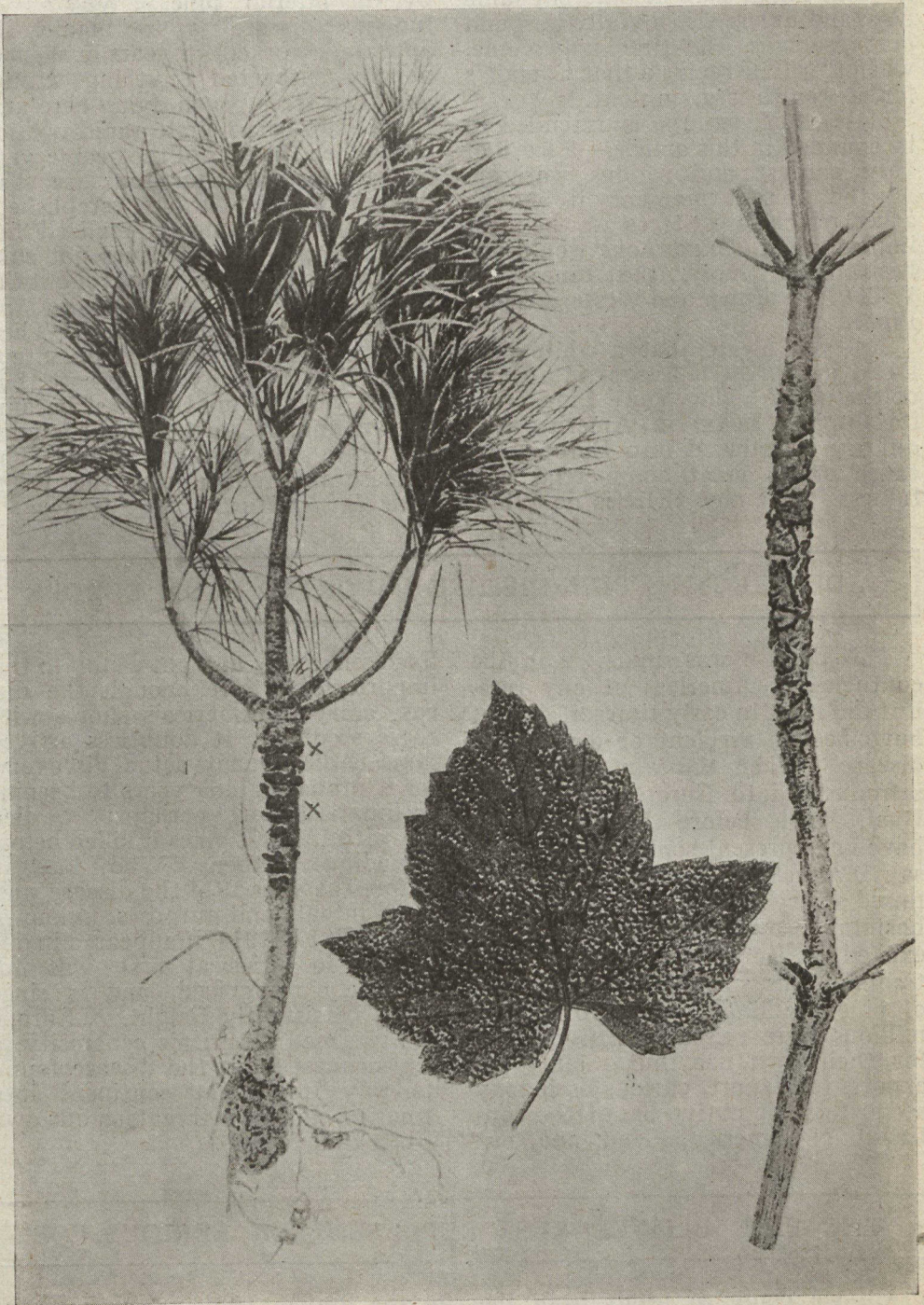
lived years ago, and put a stop to this importation! Sure enough the disease came to America's shores with these seedlings. It doubtless arrived much earlier than its actual discovery, for it probably took years to become acclimatized—or, perhaps, it died out with the first pines it killed before spreading further. Who knows? Before the year 1914 the disease was, to all intents and purposes, unknown here. But in 1914, it appeared in one or two localities at first, was immediately recognized, and is since being persistently fought. Europe has returned America's generosity in the meanest way; the disease found its way from that continent into America, and now threatens our own White Pine forests.

#### THE PINE BLISTER RUST REPRESENTS A SERIOUS FOE

Are we going to profit from the experiences of Europe? *We must!* This is the only answer possible. We must protect this most important lumber tree in our country. It is not those alone will suffer, whose interests are

in the lumber trade. Think of the thousands of homes depending directly upon the returns from such industry. True there are other trees; but the White Pine, is commercially, the most important tree, and, I shall





*White Pine Blister Rust*

1. Young pine seedling showing spore deposit at X of pine blister rust.
2. Branch of pine showing roughness of bark after girdling branch.
3. Currant leaf showing rust stage on lower side of surface of leaf.



say a word or two about its value. Think of the many industries indirectly dependent upon the pine lumber trade. Think of yourself, when one of the most important sources of revenue is lost,—what that would mean to you, to your children, to the coming generations.

Our forest resources are not inexhaustible. When that was said, nobody gave a thought to such a destructive enemy! The enemy is now within our borders—it has spread during a few years from Ontario, where it was first found in Canada, to Quebec. Its spread is alarming, but not beyond control, it is hoped. It has spread also in the United States widely, far more widely than in Canada, so far as is known.

We know the enemy, we know what it has done in other countries. We must do all we can to prevent the destruction of our white pine resources. Most of all, those who are holding white pine sections, should co-operate with the government in its battle against this dangerous foe. Combined effort alone may yet save the situation. Let there be slackness, slowness even, and the disease will defeat our efforts. Twenty years, perhaps fifty, perhaps ten,—who can tell how long it will take this plague to repeat what it accomplished before. Now is our day to do what must be done, and, if we succeed, coming generations, our own children and children's children will thank us for the deed.

### DESCRIPTION OF WHITE PINE BLISTER RUST

The first and most essential point is to know the disease. If everybody made it his business, when in the woods, every camper, every hunter, every Boy Scout, every lover of our beautiful forests, and, most of all, every forester and wood man, from lumber-jack to owner—to know, recognize, and immediately report, where the disease was observed, and, if in doubt he send a specimen to those who know it, then we may hope to cope with it before it is too late.

The disease is most of all dangerous to the young pine. When it attacks the main stem,—and as many as one hundred separate infections and more have been observed on one tree—and girdles it, which it is sure to do eventually, the tree dies. *During May and June each year*, this disease can be recognized by any one looking for the following symptoms even if he have no training; later on, only experts can determine it. All know the appearance of the fine smooth dark green bark of stem and branches of this white pine. But does everybody know the white pines from other pines? Of course he knows that the white pines have five needles or leaves in a cluster, while others have but two or three. To make sure of this, he need only cut or pull off a cluster

of leaves where they are attached to the branch, and count that little cluster held together at the base by a small sheath—if there are five needles it is almost sure to be a white pine—and even if not, (this disease only attacks five-leaved pines) it should be reported nevertheless.

During May and June, rarely after the middle of June, the disease is most conspicuous on the pine. The formerly smooth dark green bark will be found swollen, puffed up, "blistered," and breaking through the bark will be seen small whitish-orange scale-like bodies of a dusty floury appearance, composed of the spores or seeds of the disease. There may be a few or many at each point of infection. Often times one can see these from a short distance. They may be on any young branch or on the older wood, but they disappear after June, and only the blister remains, though far less pronounced to the casual observer.

Where the scales had been are often small drops of resin, or gum in the popular phrase, though these are not always present,—(or may be present from other causes.)—since even mechanical injuries to the bark, such as squirrel bites, etc., will cause gumming. In time, this bark be-



comes rough and cracked, the disease slowly makes progress up and down, or around the limb or stem, and kills the branch, or the tree if it has girdled the stem; or the wounded area may give rise to another series of spores, but at no other time of the year except May or June, will the spores be seen. In old pines the disease may live for

years; young pines will succumb as soon as the main stem has been girdled.

Thus far, the disease on the pines. The symptoms should be carefully borne in mind, and always looked for, when one is in the woods in May and June.

#### ANOTHER STAGE OCCURS ON CURRANTS OR GOOSEBERRIES

The fungus, as was said, produced orange white dust—like a coloured flour. This dust, when viewed under a powerful microscope, is composed of thousands of minute grains, spores or, popularly, seeds of the fungus. These spores, like seeds of wheat or other plants, germinate in a similar way. But not in soil like the latter. They require living plant tissues to develop. These little organisms or plants, for they belong to the vegetable kingdom, are parasitic and live exclusively on living plant tissue, somewhat as the mistletoe in Europe grows upon and with its roots within the living apple tree or other tree. The spores produced by the white pine blister rust cannot germinate on the pine direct, but pass the next stage of their life history on another host plant. When they fall upon the leaves of wild or cultivated currants or gooseberries, particularly the cultivated black currant, they germinate and produce on the lower surface of these leaves minute little spore blisters, from one to a few hundred on one leaf. These blisters are filled with bright orange-red spores, as small as those on the pine; to the naked eye they appear to be merely a reddish dust, which is the early summer stage.

This stage may appear on currants in the neighborhood of the pines from which the spores originally came, at any time from June throughout the rest of the season; though, later they produce a second kind of spores. The early summer spores spread the disease known in this stage as currant rust; from currant leaf to leaf, shrub to shrub, plantation to plantation, and thus infection may travel for miles in districts where either wild or cultivated host plants occur. These plants are not killed; premature defoliation may result, with consequences injurious to the cultivated plants, but the parasite does not kill the plant so essential to the continuation of its life cycle. Towards the end of the season the so-called late summer spores are produced. These occur on very short peg-like protuberances growing from the lower side of the leaves; and these later spores only germinate on white pines anywhere in the neighborhood. This occurs in fall, and it may take several seasons before a blister is produced on the pine, which will give rise to the pine rust stage and the spores already described. This is the life cycle, rounded off: From pine to currant—and back from currant to pine.

#### LESSONS FROM THE LIFE HISTORY OF THE DISEASE

This mode of life has acquainted us with two very important features. Without currant or gooseberry bushes there can be no pine disease, that is absolutely certain. If there be no pines—then the currants cannot be affected. Please note this point very

carefully! If we wish to keep the currants or gooseberries, the pine should be destroyed; if we prefer the pine—the former should be destroyed. When one or other is done, this disease has lost its sting. Can this be done? Would we recommend, for



instance, the destruction of pines to save the currants, or, vice versa, of the currants to save the pines? These would certainly be the most efficient means to arrest this disease. The next important lesson to be learned from the life history is the modes of spreading of the disease. It spreads of its own accord on currants or gooseberries, for miles in one season, in all directions; and eventually reaches a pine, a pine plantation, or a forest, and these then, in turn, may start new outbreaks. Hence the next lesson to be learned is this:—no currants or gooseberries near pines; no pines near gooseberries or currants.

How far apart should these different host plants grow from each other? This point is still an open question—but the farther apart the better. Can this be carried out? Sometimes a single pine, or a few pines menace the cultivated currants; sometimes a few shrubs of the latter, the former. Therefore, whichever, in a given locality, is the more im-

portant must remain, and the other be destroyed—certainly if affected, but better at any rate. Most important of all, all wild currants and gooseberries should be destroyed: they are most serious offenders. This should be done everywhere in or near valuable pine woods.

There is yet another danger, that currant rust spores may adhere on baskets of currants or other fruit, when shipped from an infected area, and spread the trouble very widely—that the disease will eventually find its way to a pine. So far as now believed, currant bushes in themselves and sold as such, do not appear to carry the disease, once the leaves are gone. Doubt still exists on this point, which we are now endeavouring to settle. Should the disease be conveyed by infected currant bushes, this would constitute a new menace, and the question become more difficult. However, it is generally held that infection of currants occurs every year afresh from nearby pines, strange as this may seem.

### THE DISEASE IS CARRIED ON PINE NURSERY STOCK

We know for certain that the pine carries the disease—it was by pine seedlings from Europe that the disease was introduced; hence importing pines into Canada should be

stopped. This was done shortly after taking up my work in Canada. No pines (five-leaved) can enter Canada from anywhere abroad, reads an order-in-council.

### QUARANTINE AND CONTROL MEASURES NECESSARY

A federal quarantine against white pine seedlings or other five leaved pines, and, if possible, against currants, etc., from infected provinces or areas, or individual nurseries, is desirable. The first work to do is the accurate location of every infected locality—this requires men and time, the more men the shorter time. The shorter the time it takes to know accurately the distribution, the better the chance to fight this disease. Therefore, let all concerned come to the fore! The

question is of greatest moment; and the experiences of other countries are on record. Shall we too fail, where others have also failed? It may become necessary, but not until the distribution in Canada of the disease is fully ascertained, to establish a safety belt of considerable breadth in which currants and pines shall be wholly eradicated, isolating, if possible, the infected area from valuable timber limits. Wherever diseased pines are located they should be immediately destroyed.



## PRESENT DISTRIBUTION OF DISEASE

During the early season of 1909 large shipments of foreign seedling pines were received in the Continent of America, part of which went to New York, New Jersey, New Hampshire, Pennsylvania, Connecticut, Vermont, Massachusetts, Ohio and Indiana. But a portion of the same shipments was introduced into Canada. In all of these States, and also as far as Minnesota, the disease is now established, as well as in parts of Canada. It was first discovered in the year 1914, near Guelph, Ontario, and later in other parts of the Niagara Peninsula, mainly on currants, but, unfortunately, on native pines also. It is now distributed generally in Southern

Ontario, but may not yet have reached the important white pine section, although no systematic search has been possible there. Quite recently the currant rust stage was found in Ottawa; as it was also this season in certain localities of Quebec province. Very urgent need exists for systematical inspection of all pine areas. In the west no inspection has yet been possible.

It is gratifying to note also that both the Ontario and Quebec governments have become deeply interested, and much work promises to be done next year. It would be a matter for congratulation if the government inspectors should be aided by the employees of lumber companies and other concerns interested.

## VALUE OF WHITE PINE LUMBER CUT IN 1915

In Bulletin 58A, published by the Forestry Branch, Department of the Interior, the white pine lumber, including both species, White Pine (*Pinus Strobus*) and Western white pine (*Pinus monticola*), is valued at \$17,584,149 for 1915, or nearly three quarters of the value of the five commercial spruce species of Canada taken together.

It is to be hoped that the matter dealt with in this article will be fully discussed at a meeting in the near future, at which all interested parties may be represented. Co-operative effort alone will save the situation. Meanwhile, if, as a result of this article, attention and careful thought become focussed on its subject matter, something will have been accomplished.

In conclusion, I wish to anticipate the probable charge against me of

crying out "wolf" causelessly, and of taking too alarming a view of the situation. Let me most emphatically re-iterate, I am an alarmist, and am so of set conviction in this matter. My attitude is based on the experience of other countries, with forest timber diseases, on the already rapid and insidious spread of this particular disease in America, and lastly, but not least, on the importance of rousing to action all concerned, while there is yet time. So surely as my warnings lie unheeded, will the ultimate loss of trade and revenue fall on all, whether or not interested financially now, in the White Pine Industry, one of the prime factors in our Dominion's vast resources.

H. T. GUSSOW,  
Dominion Botanist.

*NOTE:—Foregoing article has been issued in pamphlet form by the Canadian Forestry Association, and widely distributed.*





YELLOW PINE CONES SPREAD TO DRY ON CANVAS SHEETS.



EXTRACTING YELLOW PINE SEED FROM THE CONES. (Photos by courtesy of United States Forest Service.)



# LARGE PART OF B.C. FOREST LANDS DEVOID OF TIMBER

## Heavy Inroads of Past Fires—Present Supply Ample However For Great Development

On November 23, Mr. Roland D. Craig addressed the Forestry Club, Ottawa, on the subject of the forests of British Columbia, which he treated from the physiographic and silvicultural standpoints.

The province of British Columbia is approximately 740 miles from north to south and averages 400 miles in width, with a total area of about 250,000,000 acres. Running from north to south ranges of mountains divide the province physiographically into four main zones, which differ widely in regard to climate and silvicultural conditions. The warm, moisture-laden winds off the waters of the Japan current, in ascending the Pacific slope of the Coast Range of mountains, produce an equable climate and cause a heavy precipitation which is conducive to luxuriant forest growth. To the eastward of the Coast range lie the broad interior plateaux where greater extremes of temperature and drier conditions prevail owing to the fact that the winds have been robbed of their moisture in passing over the coast mountains. On the eastern side of the province another series of ranges, the chief of which are the Rockies, again cause a large precipitation and another belt of heavy forests, resembling those on the coast, occur. The north eastern portion of the province, comprising approximately one-eighth of the total area, lies to the east of the Rockies and belongs to the Great Plains, on which the forests are of the same type as in northern Alberta and Saskatchewan. From north to south these main zones may be sub-divided following changes in climatic conditions due to differences in latitude and local topography.

### *Bulk of Timber on Coast*

Two-thirds of the total stand of the timber in the province is on the coast, though the area is only one-quarter of the total. In the coast region for 150 miles north of the International boundary, and including most of Vancouver Island, the forests are of the Douglas fir-cedar-hemlock type, with balsam, spruce, white pine and yellow cedar as secondary species. For the next 100 miles where the temperature is lower and the precipitation heavier, red cedar predominates, with fir occurring only at the heads of the fiords which indent the coast and where the precipitation is lower. Associated with the red cedar are hemlock, balsam, spruce and yellow cedar. On the northern coast the following species occur in order of predominance: hemlock, spruce, red cedar, balsam and yellow cedar. Though confined to a comparatively narrow range on the coast, Douglas fir forms over thirty percent of the stand with red cedar twenty-seven percent, hemlock twenty-four percent, balsam nine percent, spruce seven percent, yellow cedar two percent, white pine one-half percent, and lodgepole pine and cottonwood one-half percent.

In the Interior Plateau region drier conditions permit a much wider distribution of the Douglas fir which extends to the north of the Grand Trunk Pacific Railway and in the southern region western yellow pine and western larch are added to the forest species. Taking the interior forests as a whole, spruce forms over 40% with red cedar, balsam, fir, hemlock, lodgepole pine, yellow pine, larch, white pine and cottonwood in



order of predominance. The high percentage of spruce is due to its prevalence in the northern interior and plains region.

### 60 Per Cent Waste Land

Of the 250 million acres of land in British Columbia, a very large percentage of it, 60 percent, is estimated to be waste land from the standpoint of agriculture or forestry due either to its high altitude or to local site conditions. Of the area which is capable of producing forests, not

over 8 percent, has any agricultural value. Unfortunately, the forests on a greater part of this forest land have been destroyed by fire, only 35 percent of the forest land carrying stands of commercial value at present. These forests reproduce well naturally, and if protected from fire will supply wood crops aggregating many times the present cut of one billion feet per annum. It is estimated that of the species suitable for the manufacture of pulp this province can supply 250 million cords.

## THE CHRISTMAS TREE TRADE

### Is Government Regulation of Cutting Spruce and Balsam for Decorative Purposes Practicable; the Children's Side

Every year the Canadian Forestry Journal is in receipt of many letters from readers protesting against the ruthless cutting of young spruce and balsam trees for purposes of Christmas decoration. The Association in the past has taken objection to the export of millions of these trees to United States purchasers explaining that the Canadian farmer, from whom they were taken, was paid only a few cents each and the country was often a substantial loser in having so much young growth destroyed.

It is beyond doubt that the cutting of Christmas trees becomes in some cases an act of vandalism as was recently reported from Hamilton where hundreds of young spruces from a semi-public park were cut down and peddled about the city.

That there is another side to the story is suggested by the following comments of Bristow Adams in "American Forestry," and readers of the Journal are invited to express an opinion as to how any Government regulation could lessen the waste of evergreens each year for these decorative uses, without clashing with an undoubtedly vigorous public sentiment ready to resist the elimination of the time-honored right to brighten Christmas day with a festive tree.

"Every year some one starts a cru-

sade against the Christmas tree idea, and every year I wonder why they do not do the same thing against the Easter lily and the football-game chrysanthemum. In Michigan there is a nursery which grows Christmas trees as a regular annual crop; in New England the farmers cut hundreds of thousands out of their fields for the city boys and girls, some of whom rarely get in any closer touch with trees than they do in this holiday season. Every year the dairy farmers in the hill counties of New York welcome the chance to get rid of the spruces which work into their pastures and use up space that might be growing grass for the cows. The more our family has thought about the use of Christmas trees, the more we have been in favor of them.

"One person says, 'let's all do without Christmas trees; or, if we must have them, let every one plant two trees for the one that is used on Christmas.' Now that might be a good idea in some few places. But how about the many children who live in tenements in the crowded parts of the cities? Are they to go without this one glimpse of greenness, or attempt to make two trees grow in a paved court-yard? Even in the large and elegant apartment houses the mighty janitor could not provide



places for two trees for the children who live there. Oh, yes, there are some apartment houses that take children. I've seen 'em!

Then there are the children on the farm, where father has brought in the home tree from the back pasture, and has sent John down to the freight station, with forty bundles of trees on the big sled. He is glad to have that much more clearing done, and to have the work pay for itself. He wouldn't care, I am sure, to have a tree-planting band go out and put in two new ones.

Besides, there is all the trouble and expense of getting the two additional trees, and the very great risk that they will not live after they are planted would make possible a loss of three trees instead of one.

"The best way is to have just as much or as little Christmas tree as you wish, but not to try to make other folks do things your way. In many cases the merriness of the Christmas of the farm child depends on whether there is a good sale for the trees that the farmer hauls to train or town. In any case, could we get the opinion of the tree, it would probably echo what one said in our discussion: "If I were a tree I'd rather be used in making little children happy at Christmas than in any other way."

#### **The Christmas Tree Trade.**

It is most unfortunate from a conservation standpoint that Christmas requires the use of tens and tens of thousands of spruce and other evergreen trees, observes the Pulp and Paper Magazine. These trees are cut down and shipped out by the car load; the annual export making very serious inroads on the future timber supply of the nation.

Among cattle men and farmers a movement has been started to put a stop to the killing of calves for veal. It is pointed out that the present very serious shortage in dairy and beef cattle is largely due to the pernicious habit of slaughtering young calves. If a calf is allowed to grow to maturity it plays a very much larger part in the economic life of the nation than if slaughtered shortly after birth.

In much the same way the cutting down of young spruce trees affects our supply of pulp wood. A man gets but a few cents for a Christmas tree yet it is probably cut from a hillside which is incapable of growing anything else but trees. The cutter never thinks of replacing the destroyed tree with a seedling and so the way is paved for the land to become a barren waste. If the tree is left to mature and then cut and used to make paper the return is much larger and with our growing appreciation of the value of reforestation the probabilities are that a seedling or two would be planted to take the place of the tree cut down.

From the standpoint of the papermen the Christmas tree trade is most hurtful and we would like to see the Pulp and Paper Association and the Commission of Conservation take some action in the matter.

Above all others the cry of "Woodman spare that tree" goes out to the man who cuts down and ships out car loads of young spruce trees.

#### **Canada As a Paper Maker.**

Indications point to Canada as one of the most important pulp and paper producers of the world for many years. There is no reason, except apathy respecting fire-protection in the pulp producing regions, why Canada should not produce perpetually a large part of the world's paper. The large spruce forests in the east and north including the sub-arctic forest which has value chiefly for pulp, show Canada's capacity to grow suitable wood in enormous quantities, sufficient, with any kind of protection and management, to supply the demand of all time. Pulp forests are, however, particularly susceptible to fire, and need careful protection.

It is gratifying to see that some of the most progressive pulp companies are successfully protecting their lands from fire. On account of the comparatively rapid growth of pulp timber to a commercial size it appears that pulp companies will be the first who can prove that scientific forest management is good business for a private concern.





FUR TRADING CAMP ON THE NELSON RIVER, NORTHERN MANITOBA.

## Canada's Fur Crop Nearly \$2,000,000

Recent reports of severe forest fires in the neighborhood of Hudson Bay and James Bay mention the serious effects upon the trapping and fur trading activities of the Indian population.

The last Dominion census gives the total value of Canada's fur crop in 1910 as \$1,927,550. The item of greatest value in the table is that for "assorted furs", \$445,320; muskrats, \$256,213; martens, \$221,583; and minks, \$221,500. The largest production is naturally in the unorganized territories, the value being \$500,217. The figures do not apply to production of fur farms or from wild animals in captivity.

### J. D. Gilmour Promoted.

John D. Gilmour, formerly with the Forest Branch of the Department of Lands of British Columbia, has resigned in order to accept the position of general logging superintendent of the Anglo-Newfoundland Development Company, Ltd., a branch of the Harmsworth Company, owners and operators of immense pulpwood holdings in Newfoundland. Mr. Gilmour will assume his new duties during January, and will be stationed at Grand Falls, Newfoundland. Mr.

Gilmour is a 1908 graduate of the Ontario Agricultural College and also of the Department of Forestry in the University of Toronto. He has had experience in the employ of private lumber companies and also in the Forest Branch of the Canadian Pacific Railway and the Forest Branch of the Department of the Interior at Ottawa. Since 1912 he has been on the staff of the Forest Branch of the Department of Lands of British Columbia, being district forester at Cranbrook from 1912 to 1915 and on the head office staff at Victoria during the past year.

### B. C.'s Growing Pulp Industry.

The increasing production of pulp and paper in British Columbia continues, and it is announced that the plant of the Empire Pulp and Paper Mills, at Swanson Bay, 100 miles south of Prince Rupert, will be turning out chemical pulp in commercial quantities, the daily output when the plant is in full running order being between thirty-five and forty tons.

Steady expansion in the lumber industry along the line of the G.T.P. in British Columbia is noticeable, notably east of Fort George.





### *Free Cartoon Service of Canadian Forestry Assoc.*

Although the interests of the farm and the forest have been regarded in the past as more or less distinct and hostile, the broader outlook stimulated by the War has brought intelligent Canadians to understand the woodsman and the agriculturist as close partners in the great Canadian estate.

More than sixty per cent. of the whole area of Canada is adapted by Nature for growing timber or held as permanent barrens and will not produce field crops profitably. On this sixty per cent. no farmer desires an acre. At the same time it ought to be producing revenues for the nation. As much of it as possible should be kept under frest growth, producing wood crops regularly. This is the argument for "forest conservation" in a nutshell. No one asks to be allowed to use agricultural lands for tree growing. And no farmer will object if the country maintains non-agricultural lands in their natural money-making conditions, giving timber harvests year by year.

The Forest Dollar, therefore, is not earned at the expense of agriculture,

but is the ally and supporter of agriculture. Canada takes \$200,000,000 a year from the forests and a very great part of this amount goes to purchase farm products. Until every destructive forest fire is stopped and every timber-growing area restored to its productive condition, Canada's agricultural interests must suffer the chief loss. Of every hundred dollars that come out of the forest, seventy-five dollars go for wages and supplies. The remaining twenty-five dollars pay interest on the lumbermen's investment and help make up the \$7,500,000 taken by the provincial and federal governments each year in taxes.

Canadian Forestry Association,  
Ottawa.

#### **New B. C. Minister of Lands.**

The Hon. Thomas Dufferin Pattullo, has been chosen as Minister of Lands in the new administration formed by the Hon. H. C. Brewster. Mr. Pattullo, represents the district of Prince Rupert in the provincial legislature, a section of the country containing considerable forest resources.



## B.C. PREMIER PLEDGED TO PLACE SERVICE ON MERIT BASIS

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From the courageous action of the new British Columbia Government under Premier H. C. Brewster in definitely committing itself to an elimination of the patronage system in Civil Service appointments and other administrative undertakings, and the engagement of Dr. Adam Shortt of Ottawa to make recommendations toward such an end, there

seems every likelihood that the Forest Service of British Columbia will receive substantial benefit.

In an effort to re-inforce the Premier's determination to remove the serious handicap of the patronage plan, the Canadian Forestry Association directed to him a letter which, with Mr. Brewster's reply, are given herewith :

Ottawa, Nov. 17th, 1916.

Hon. H. C. Brewster,  
Victoria, B.C.

Dear Sir:—

We have followed with much interest and satisfaction the assurances given during your recent campaign favoring the elimination of the patronage principle in Civil Service appointments and the conduct of provincial affairs. To the adoption of such a principle by all Canadian Governments, the Canadian Forestry Association has devoted no inconsiderable part of its educational campaigns, and in successive conventions has pledged its support to the merit system of appointment and promotion.

In taking such a stand, the Association has been especially concerned for the welfare of the various forest services. It has been demonstrated beyond argument that the qualities of skill, energy and devotion, absolutely requisite in a genuine system of forest guarding, are at a severe discount where the 'patronage' plan of appointments is in control.

In Canada and the United States, extravagant and inefficient forest protection systems are to be found precisely where the patronage scheme has most freedom. In such instances the public pays heavy tolls not for prevention of timber losses but to keep party followers in well-paid idleness.

The Forest Service of British Columbia has built up the best record of any forest service in the Dominion. The reduction of fire losses has been a direct consequence of good organization, close inspection, and a competent personnel. What has been accomplished in four years is a forerunner of even better results in timber saving during the years ahead. We take it for granted that the new Government will not only regard the Forest Service as the foundation of the whole timber industry, but will see that its expansion coincides with the opportunities and responsibilities certain to develop.

A forest service takes its character from its executive head. Mr. H. R. MacMillan's work as Chief Forester of British Columbia was largely responsible for the creditable results obtained. The capability of Mr. MacMillan's successor in the office will determine whether the Forest Service will maintain its usefulness to the province or restore the old days of ill-management and heavy waste from forest fires. We are convinced that the next Chief Forester should be a man of high calibre, with administrative ability and that



he should be in substantial agreement with the policies of his predecessor. The British Columbia Forest Service is to-day on the right road, and any radically-altered direction would, we are convinced, end in misfortune.

Having regard to the great tasks awaiting the Forest Service of your Province, this Association feels confident that the Civil Service principle will be followed by you in selecting a new Chief Forester. We do not doubt that a worthy successor can be found within the present staff. It is our hope, equally, that your pledged adherence to the merit system in public appointments will lead to the development of a permanent Forest Service staff reasonably secure in their appointments and thereby incited to their best efforts.

Yours truly,

Canadian Forestry Association,

ROBSON BLACK, Secretary.

### HON. MR. BREWSTER'S REPLY

Victoria, B.C., Nov. 24, 1916.

Robson Black, Esq.,

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

Dear Sir:—

I have the honor to acknowledge receipt of your communication of Nov. 17th in which you deal at some length with the excellence of the Forest Laws of British Columbia, and the necessity of the careful and judicious administration of these by the appointment to official positions of men who know their work, and can command the respect and confidence of their subordinate officers.

I note also your intimation that efficient service could be secured best by the entire elimination of the patronage system in the Forest Service. It will be the intention of the new Government to abolish the evils of the patronage system, wherever these have been in evidence, and the Forestry Service will, in no sense, be an exception to this rule.

I thank you for the courtesy of your letter and can assure you that when a Chief Forester is selected the appointment of such an official will be upon merit, as far as the new Government is in a position to decide.

Yours truly,

Signed H. C. BREWSTER.

## *Poor Trees in Woodlots*

Many woodlots contain a large number of inferior species, trees that have little or no commercial value such as hawthorne poplar, willow, juneberry, ironwood and blue beech. In cutting firewood these should first be removed. They are occupying space which might be better utilized

in growing more desirable species. The removal of dead, decayed and over-mature trees is also advisable. Dead trees or dying trees are a source of danger to other trees. They harbour insects and develop rot producing fungi which spread to sound trees. —B. R. Morton, B. Sc. F.





BRUSH WELL PILED FOR BURNING. AN OPERATION SUPERVISED BY DOMINION FORESTRY BRANCH ON DOMINION LANDS IN ALBERTA.

## Ontario's Protective Plan Under Way

Mr. E. J. Zavitz, Forester of Ontario, who was recently given charge by Hon. G. H. Ferguson of the new department to re-organize the forest protection service will spend the greater part of the winter in Northern Ontario locating the areas most in need of protection and arranging for co-operative action wherever possible. A Toronto newspaper article has the following:

"Hon. Mr. Ferguson has been in communication with representative lumbermen for some time on the subject, and it is expected the lumbering companies, having a common interest with the Province in protecting the forests, will assist in the work of fire prevention and bear their share of the cost.

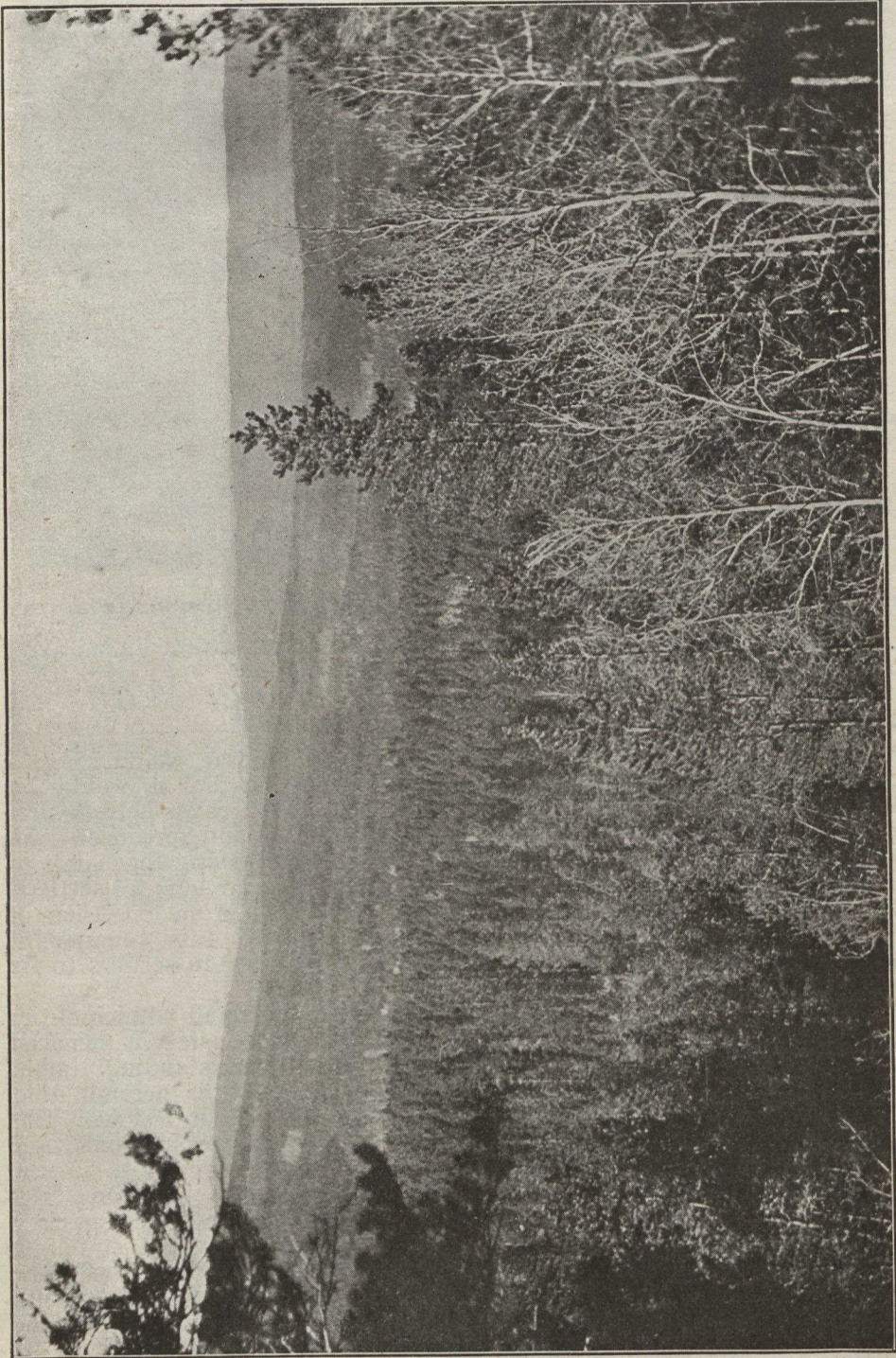
Thousands of bushels of timothy and alsike clover seed are to be sent into the burned-over areas of Northern Ontario next spring to make good the damage to pasturage.

The Minister further announced that he intended to have all Government lands in the burned districts

seeded. The seeding would serve a double purpose in that it would by furnishing a green cover help to prevent the starting and spread of fresh fires, and by furnishing thousands of acres of good pasture land for settlers' cattle. The step is an extension of the plan adopted this summer of furnishing free seed to settlers to fix up their pasture.

To protect the small municipalities in the North whose safety is menaced by the presence of standing timber near their doors, it is possible that legislation will be introduced this session to give the corporations some authority over wooded lots in the surrounding country. In some sections of the north owners of land close to the towns have left it standing, unimproved for years. It was the proximity of such wooded lots to several of the municipalities in the North that brought about their destruction last summer. The matter has not been definitely decided upon, but some such plan is to be shaped up."





TIMBER RESOURCES OF ALBERTA.  
Lodgepole pine on headwaters of the Swan River.



# HOW QUEBEC ASSOCIATIONS RID THE FOREST OF SETTLERS' HAZARDS

## Remarkable Record Achieved in 1916 on more than 24,000 Square Miles of Timber Lands

In the 12,000 square miles of Quebec, patrolled by rangers of the St. Maurice Forest Protective Association, 1213 settlers living in timbered districts where carelessness with fire is a direct bid for a catastrophe took out 'burning permits' during the summer of 1916 in accordance with the Quebec law.

They took out the permits for more reasons than fear of a legal penalty. The written permit to burn the slash in their clearings was equal to an insurance policy on their lives, their homes, and the valuable timber of the neighborhood. By means of the 'permit' a skilled ranger supervised their dangerous slash fires. He made the job a safe one. The settler got a thorough 'burn' to clean up his land, but he made sure of preventing another 'Claybelt Horror'. No red tape. Nothing unreasonable. Today, the Quebec settler in that district holds up both hands for the 'burning permit.'

1213 settlers' fires in 1916 in the St. Maurice area! And *not one fire got away*. Every fire a safe fire! Only one settler refused to co-operate in playing safe; he was prosecuted and fined.

### *More Proof*

Over 1000 settlers' permits were issued in another 12000 square miles of Quebec, patrolled by the Lower Ottawa Forest Protective Association. How many of them escaped from the clearings? *One*. And it did practically no damage before it was extinguished. Why this remarkable change from the old days when forest holocausts (produced frequently from runaway fires in settlers' land-clearing operations) ravaged whole town-

ships and destroyed lives and property? First: a law requiring the settler to take out a 'permit' before burning his slash; second: a vigilant, thorough system of forest patrol by qualified rangers.

The Claybelt Horror came to Ontario's northland in 1916 because in the absence of any 'permit law' or patrol system, hundreds of settlers' fires got loose at the hottest part of midsummer and swept like a cyclone across 800,000 acres between Matheson and Cochrane.

### *A Warning to the West*

Most of the new immigration in the prairie provinces is taking up lands in the northern timbered areas, thereby duplicating the forest fire hazard of the Ontario Claybelt.

As with Ontario in 1916, and in the old days of the sections of Quebec referred to, settlers' clearing fires can be set out in the hottest weather, on the windiest days, with slash piled dangerously against the edge of standing timber. No existing law (except in Manitoba, where it is not enforced) prohibits such disregard of grave risks. Any year of drought may duplicate for Manitoba, Saskatchewan, or Alberta, the terrible events in Northern Ontario in July last.

The only known safeguard against wanton destruction of lives and timber possessions in settled forest lands is the enforcement of 'burning permits'

The plan has worked with striking success in British Columbia, Nova Scotia, large areas of Quebec, in many of the States of the American union and will soon be operated in Ontario. It has won the sympathy and co-operation of settlers wherever applied.

Is the West ready to protect itself?



**DEATH OF 'DON' BROPHY.**

John Bernard Brophy, known in athletic circles as 'Don', a member of the staff of the Dominion Forestry Branch, Ottawa, was killed in England on Christmas Day in an aeroplane accident. He was a son of Mr. John B. Brophy, C.E. of the Public Works Department and after attending McGill University was engaged in the draughting department of the Forestry Branch.

Enlisting in October, 1915, he was sent overseas in November and underwent training as an aviator. He saw much active service in the flying corps and after a series of exploits redounding greatly to his credit, was wounded and sent to England. There he was engaged in air patrol duties when an accident occurred to his machine during a flight.

**Fire Rangers' Annual Meeting.**

The annual meeting of the Dominion fire rangers was held at Revelstoke, B.C., recently. Reports were presented by all the rangers present, which showed that good results had been secured in the prevention of forest fires. A number of resolutions were adopted, among them being the following :

"That the provincial government be requested to extend the permit

period for the season from September 15 to September 30."

"That the provincial government be requested in future when constructing new roads to dispose of the debris as they go along, instead of leaving it lying at the roadside, as it is a great fire danger."

**Waste of Wood in Sawmills.**

There are more than 48,000 sawmills in the United States, and their output of waste in the form of sawdust, shavings, slabs, and other wood refuse is estimated as 36 million cords per year. This is equal to over 4½ billion cubic feet of waste, which is the capacity of a bin one-half mile high with a base covering a forty-acre lot. Or, considering each cord to contain eighty cubic feet of solid wood with all the cracks and air spaces taken out, these 36 million cords would make a block of wood more than a quarter of a mile on each edge.

Perhaps one-half of this so-called waste product is not, strictly speaking, wasted, but serves a useful purpose as fuel under the boilers. Much of the remaining 18 million cords not only serves no useful purpose, but in most cases is a source of inconvenience and danger, and costs the mill time and money.

## *Fire Protective Convention Feb. 1 and 2*

A rousing convention of those concerned with forest fire protective work will be held at Montreal, Thursday and Friday, February 1 and 2. Invitations have been sent to the lumber companies, Federal and Provincial Government officials, inspectors of the St. Maurice and Lower Ottawa Forest Protective Associations, etc. The convention has been organized by the St. Maurice Association officials.

It is expected that the speakers

will include E. T. Allen, Forester of the Western Forestry and Conservation Association, Portland, Oregon; A. E. Graham, Manager of the Lower Ottawa Association; T. B. Wyman, Forester, of Munising, Mich.; W. R. Brown, Berlin Mills, N. H.; G. A. Gutches, Dominion Forestry Branch, Prince Albert; and others. The topics will have great variety and interest and an invitation is extended to members of the Canadian Forestry Association to be present.



# FORESTS IN ITALIAN AND BALKAN WAR ZONES

## A Graphic and Detailed Picture of Forest Conditions Where Armies Meet for Battle.

By Prof. J. S. Illick

The forests of the Mediterranean peninsulas, viz: The Iberian, comprising Spain and Portugal; the *Italian*, including Italy and a few adjoining provinces of Austria; and the *Balkan*, consisting of Servia, Roumania, Bulgaria, Greece, Albania, Montenegro, European Turkey, and a few of the southern provinces of Austria have never been favored naturally nor biologically. Nature did not produce there, as in America, vast and dense forests of valuable species. The original forest was, as a rule, only mediocre in density and composition. Furthermore, man and a score of other destructive agencies, particularly goats, have been abusing the forests ever since they have been opened up to such an extent that today one finds in the countries about the Mediterranean some of the poorest forests of continental Europe. They stand in strong contrast with the forests of Belgium, northern France, eastern Prussia, western Russia, and Galicia.

In 1911 the writer had the privilege of accompanying Prof. Gustav Hegi, of the University of Munich, on a botanical and dendrological study-tour through a portion of the country now occupied by the contending armies in the southeastern theatre of the war. A considerable portion of the trip was made afoot through rather remote regions. This enabled the participants to observe the forests and other allied rural conditions at close range. It would not be possible to discuss within the space of a short article the forest conditions found on

the three Mediterranean peninsulas, nor even of the countries comprising the Italian and Balkan peninsulas, most of which are engaged in the present war. Therefore, it seemed advisable to confine the present article to a limited portion with forest conditions fairly representative of the whole. The region about the Austro-Italian front has been selected for this purpose.

### *Once Forested.*

The principal provinces which Italy hopes to regain from Austria are Trentino and Gorizia. In them most of the recent battles between the Austrian and Italian troops have been fought. The former province projects into northern Italy in the form of a blunt wedge; the latter borders Italy on the extreme northeast above the Gulf of Trieste. These two provinces form the backbone of the "Italia irredenta." History informs us that these provinces were originally forested with stands of average density yielding a fair quality of material. But conditions have changed. Today forests are conspicuous by their absence, not only upon limited areas, but over an enormous territory. Thousands of Italian immigrants have never seen a real forest before coming to America. The forests of their homeland have been destroyed by the conjoint destructive work and devastating abuse of many agencies. Excepting the steep slopes of the Alps, the more inaccessible tops of the Apennines, a few remote plateaus and scattered



spots bordering bodies of water, the forests of Italy are in reality miserable brushland. Acres of desolation—the result of centuries of forest abuse—abound on every hand. All Europe does not contain a more deplorable picture on so wholesale a scale.

#### *Reasons for Neglect*

One wonders why forest destruction was allowed to continue for so long a time and on so gigantic and intensive a scale, for it seems as if the ultimate outcome of such a process must have been foreseen. The writings of foresters as far back as the middle ages bear evidence that the significance of such a destructive tendency was comprehended. They were, however, unable to accomplish much because political disturbances and inefficient management had impoverished the public treasury, and the spirit of the people was antagonistic to anything which implied present sacrifice for future gain. Furthermore, the need of forest products—the real stimulant of forest conservation—was never keenly felt in this sunny and peninsular southland. The warm climate and the absence of extensive wood-using industries reduced the demand for fuelwood and raw material of larger size, and accessibility by sea made the importation of needed wood material feasible. Not much material was needed; and the small amount which was required could be imported cheaper and easier than it could be raised at home. But these are only the primary causes for the present poor forests. Secondary destructive agencies became operative as soon as the forests had been opened up and partly removed, and have been conducting a destructive campaign ever since on such a wholesale and continuous a scale that the resultant damage far surpasses that of the primary causative factors. There are a large number of these secondary destructive agencies which in many cases have impoverished the land almost, if not entirely, beyond redemption. Fire, goats, erosion and floods, are the principal secondary malefactors, and a brief account of the nature and extent of their destruction may serve as a valuable

lesson to us in America, now in the formative period of forest conservation.

#### *Heavy Fire Damage*

Wasteful lumbering was followed by destructive forest fires which burned over the mountain slopes repeatedly. They were aided by the hot and dry climate and high winds; and, as a rule, unhindered by man. Various governing bodies passed laws pertaining to the prevention and extinguishing of forest fires, but were powerless to enforce them. The public gave little attention to them because it was realized that the evil effect was deferred rather than immediate. Upon these burnt-over areas there appeared a dense fire-coppice growth of brush consisting of shrubs, many inferior, and a few valuable trees.

This shrubby growth afforded excellent pasture for goats, which the inhabitants considered more indispensable to their welfare than forests. Under such conditions the goat industry naturally grew, but the forests disappeared; and now, in view of the damage already done, the goat is regarded as the most destructive enemy of the forests of northern Italy and other nearby mountainous countries. They are present everywhere in large numbers. There is no city, village, hamlet, nor hardly a home or an acre of mountain land without them. According to a late census there are about 2,000,000 goats in Italy; that is, about one goat to every 16 inhabitants or about one goat to every 5 acres of forest land.

As soon as the forest cover with its absorbent carpet of leaf-litter is removed or destroyed, the fertile forest soil—the result of centuries of vegetable accumulation and rock disintegration—is exposed to the devastating influence of rain and snow water. The process of erosion soon begins on a small scale and increases with each successive rain or snowfall, until practically all the productive soil has been removed and nothing remains except bare rocks, forming abrupt cliffs or strewn over precipitous slopes. In summer these slopes assume a thirsty and parched appearance, and the rivers which they feed are but



narrow threads trickling through broad beds. In springtime these same slopes are the birthplace of raging torrents which burst forth with uncontrollable force in the plains below, inundating fertile fields and depositing enormous quantities of detritus at undesirable places. There are more than 600 miles of artificial embankments along the Poe river, which meanders through a rich but almost treeless agricultural region after bursting forth from the mountains. A large number of protective structures exist along the Adige river, which flows through the center of the province of Trentino in which many fierce battles have recently been fought. Both of the contending armies have suffered severely from heavy rains and spring floods. Reports tell us that many groups of soldiers have lost their lives in crossing and recrossing this stream when swollen and raging. In order to obtain a real vivid and lasting impression of this desolate region, one should approach it from the north, that is, immediately after having spent some time in the intensively managed and normally stocked forests of central Europe. In Belgium, France, Prussia, Russia and Galicia, the soldiers seek shelter in woods, cover their batteries with branches and faggots, corduroy roads with poles, line their trenches with poles and props, and finish their subterranean chambers with sawed timber. The soldiers of the armies operating in the Tyrolean Alps are not so fortunate. No wood is at their disposal, for they are located in an almost forestless region. Consequently they are compelled to seek shelter amidst enormous rocks which cover the slopes and to drill chambers into the solid rock formations which crown commanding heights. Under such conditions the contending armies cannot do much damage to the forest growth, but they are certainly making the task of the future reforestation more difficult. The present damage may not be so great, but the ultimate, and in many cases irreparable loss will be felt by many subsequent generations.

### *Italy's Tree Assets*

One must not conclude from the foregoing description that Italy is treeless. It has many valuable trees, but most of them occur in orchards and parks, on estates and lawns, and along streets and boundary lines. There are in Italy about 2,000,000 acres in olive groves, and 400,000 acres in chestnut orchards, and thousands of mulberry trees which support the silkworm industry. The lemon industry holds a prominent place about the subalpine lakes, because of the superior fruit produced. An enormous number of trees are also required to supply props for the vineyards which cover almost nine million acres.

The Italian government has not been unmindful of the need of forest conservation and restoration. Numerous protective and constructive laws have been enacted, but little was accomplished until about 1877. Since then the land has been classified and protection forests have been established on the higher mountain slopes. Special inducements are given to individuals and communities who reforest mountain land. In 1902 it was decided to celebrate a "Feast of Trees" (la festa degli alberi), copied after Arbor Day of the United States. On March 31, 1902, the city of Rome held the first celebration in the presence of the king and the queen, planting about 10 acres with trees. A forestry school is maintained at Vallombrosa, located in the heart of the Apennines, and easily visited from Florence. It is surrounded by magnificent forests, and far removed from the whining beggars, ringing bells, plaintive yells, and offensive smells so characteristic of Italian cities.

### *Forests of Austria.*

The forests of Austria, as a rule, are carefully managed and well stocked. The provinces bordering Italy, however, are an exception to this rule. They bear no evidence of that careful management so characteristic of the forests in the interior of the empire. These provinces have been under Austrian rule for more than a century, but no traveller would know it if it were not for the postage



stamps, money, and laws. The atmosphere is decidedly Italian, the government alone is Teutonic. A sojourn of a few days in cities and a longer period of travel on foot through rural portions of these provinces furnished abundant and convincing proof to the writer that the inhabitants were eagerly and almost unanimously awaiting the day when they would be redeemed or incorporated into the kingdom of Italy. This prolonged political unrest may be at least a partial explanation for the present unsatisfactory forest conditions.

The forests of the other countries of southern Europe, most of them now at war, are not exactly like those described but they have many points in common. They are, as a rule, poorly stocked and mismanaged. A general perspective may be obtained by classifying them under two headings, viz.: wood importing and wood exporting countries.

*Wood Importing, Wood Exporting,*

Italy,	Roumania,
Servia,	Bulgaria.
Greece,	
Spain,	
Portugal,	
Turkey.	

All the above-named wood importing countries, except Servia, have a small forest area per capita of population. Servia has a total forest area of 3,750,000 acres, about 37 per cent. of which is classified as state forest land. In spite of this large forest area considerably more wood is imported than exported. This is due to the unorganized condition of forest utilization. Roumania and Bulgaria, the only countries whose exports exceed imports, have forest areas of 6,250,000 and 7,570,000 acres respectively. In both countries the hardwood, chiefly oaks, beech, elm and walnut in the southern part of Bulgaria, comprise more than 75 per cent. of the forest area. These extensive and unexploited forests are a valuable asset and will become more valuable as reconstruction progresses after the war. The consequent loss, however, will be

enormous and the damage in innumerable cases irreparable.

J. S. ILLICK.

From "Among The Trees."

Ye have no history. I ask in vain  
 Who planted on this slope this lofty  
 group  
 Of ancient pear-trees that with the  
 springtime burst  
 Into such breadth of bloom. . . .  
 Who was it laid  
 Their infant roots in earth, and tenderly  
 Cherished the delicate sprays, I ask  
 in vain,  
 Yet bless the unknown hand to which  
 I owe  
 The annual festival of trees, these  
 songs  
 Of birds within their leafy screen,  
 these shouts  
 Of joy, from children gathering up  
 the fruit.  
 Shaken in August from the willing  
 boughs.

—Bryant.

**B. C. Exporters Co-operate.**

Arrangements have been completed in Victoria, B.C., between all the exporting manufacturers of lumber in the province, with one exception, to pool their output for export purposes and have it handled by the Canadian Trading Company, which was incorporated for this purpose recently under British Columbia legislation. This company, through its connections in London and San Francisco, will be able to guarantee tonnage for lumber shipments within a very short time, and has also chartered all the vessels now being built in British Columbia yards for the lumber trade, with one exception.

There are 2,580 daily newspapers in the United States.

*Palp  
 River*



## The Ancient Cedars of Lebanon

By Guy E. Mitchell

The great Cedars of Lebanon are among the most interesting living records of the past. The grove which is standing to-day is the remnant of the same forest from which the cedars were cut and hewn for the building of the Temple at Jerusalem by Solomon. There are many references to the Cedars of Lebanon in the Old Testament, the most notable in First Kings, where it is stated that through the cooperation of Hiram, the King of Tyre, Solomon brought great rafts of cedar from Lebanon to Joppa and carried them up the steep mountain-sides to Jerusalem for the first temple. In the building of the second temple, under Ezra and Nehemiah, the timbers were procured from the same cedar forest on the slopes of Mount Lebanon. At an earlier period the Psalmist refers to the Cedars as the ornament of Lebanon and one of the great glories of God's creative power and wisdom. Pliny, the Greek naturalist, named the species *Cedrus magna*, meaning "great."

The impressive thing about this ancient grove of cedars is the knowledge that the oldest and largest of them were undoubtedly living at the time when the timbers of their immediate predecessors supported the Temple. They are upwards of 2000 years old, not so old as the great Sequoias of our Pacific Coast, but still very ancient. At present there are only about 400 trees left, all very large and old. The best preserved are about 100 feet high and one has a circumference of 47 feet. The grove is now protected by a well-built, high stone wall; but all the balance of the great cedar forest of Lebanon has succumbed to the greed of man, and the grove stands like an oasis in the desert.

In considering the otherwise absolute destruction of the forest over the entire mountain-side, one cannot

help but wonder why this group has been preserved. A probable explanation is found in the name of the stream at the foot of the mountain—the Kadisha—which rises in the moraine left by the great glacier which swept down from the summit of Lebanon and on which the Cedars of Lebanon thrived during early Biblical times. This word is the Hebrew for "holy" and the grove has undoubtedly been preserved because of its sacred character. The natives to-day will tell you that the grove is sacred because it "was planted by Jesus Christ,"—a belief which finds the semblance of justification from a poetical passage in the 104th Psalm referring to "the Cedars of Lebanon which the Lord has planted."

As the traveler stands on the summit of Lebanon, nearly 10,000 feet high, and looks down upon this ancient grove, the remnant of a mighty forest, and upon the still more ancient glacial moraine upon which it grew, and sees upon the flank of Lebanon the ruins of ancient temples and the vast expanse of the Mediterranean beyond, and to the east the distant ruins of Syrian Baalbek, he may recall the force of the words of Holy Writ, "all flesh is grass and as the flower of the field it perisheth." Over this expanse, witnessed by these trees and their immediate predecessors, have come and gone all the great nations of antiquity. Here are the relics of the Assyrian, the Babylonian, the Egyptian, the Phoenician, the Greek, the Roman, the Moslem, but yesterday, as it seems, the Crusader, and now the warring Turk and Slav. And each has done, and perhaps to-day is doing, his part to destroy the mountains' noble covering of forest and to add to the desolation wrought by his predecessor. Could the process but be reversed, and the greed of man restrained and protection be



given to the reforestation of the region. the Cedars of Lebanon might again become, as in the days of the Psalmist, the glory of the mountains. —(From American Forestry).

### “Real Forest Fire Protection for Ontario”

(“Canada Lumberman”)

“The announcement made by the Minister of Lands, Forests, and Mines for the Province of Ontario that his department is coming into line with those of several other Canadian provinces and adopting modern methods of fire prevention, so as to put an end to the enormous annual losses of standing timber, is a welcome piece of news. It means, we feel safe in predicting, that if the methods used in the other provinces are properly adopted and rigidly put into operation in Ontario, we have now experienced the last of our great conflagrations in the forest districts of Northern Ontario such as that which during the past summer wiped out of existence hundreds of settlers, together with their homes and effects, and caused incalculable damage to our standing timber. It means, too, that the families going into Northern Ontario to settle can depend in future upon practical protection against such calamities, and so feel encouraged to undertake the task of settling in the new country. Undoubtedly the prevention of forest fires will have the double effect of saving timber and giving a stimulus to settlement.

A great source of difficulty in the past has been the conflict of interests between timber owners, settlers, and prospectors, together with the inability of the individual settler to protect himself against the carelessness of others. This can now be entirely done away with. The time of year at which the Minister has made his announcement is a fortunate one, because between now and the next danger season in the summer of 1917 there will be time enough to arrange details and appoint the necessary staff to put the system into effect sufficiently to reduce greatly and

probably almost eliminate the fire losses that we could otherwise predict with certainty for next year.”

### Paper Suspensions.

Eight hundred country newspapers have suspended in the United States since the price of news print paper began advancing, according to a statement made before the California Press Association.

### Asking The Settlers' Help.

The ingenuity of some of the northern fire rangers in the prairie provinces in working up publicity schemes to aid fire prevention has often received a deserved testimony. The Association recently received a unique book of photographs fashioned between birch bark covers, and with typewritten text graphically describing the case for forest protection. It was the work of Jas. T. Blackford, Chief Fire Ranger of the Dominion Forestry Branch at Norway House, Manitoba. The only means of access to the country patrolled by Mr. Blackford and his men is by steamboat, and the book was placed on a table of the steamer so that hundreds of travellers coming in and out read it through. On the cover are the words: “Manitoba North Fire Rangering District, Patriotic Slogan: ‘No Fires in 1916.’” It is hoped that such happy ideas will be put into practice elsewhere.

### Lightning Hits Chestnuts.

Lightning shows a marked preference for chestnut trees, according to data based on reports submitted to the U.S. Department of Forestry by its foresters. Of a total of about 2,000 trees struck by lightning on the State Forests in the past four years, 655 were chestnut. Pitch pine comes next with 327 trees struck, and then follow in order rock oak, white pine, hemlock, red oak, white oak, black oak, locust, and sugar maple. Black birch is at the foot of the list with only one tree struck in four years. Poplar and walnut come next, only two of each being struck.



# 1,000 NEW MEMBERS JOINED IN 1916

## Successful Ending to Twelve-Months' Effort in Building up Strength of the Canadian Forestry Association

The goal of 1000 new members for the Canadian Forestry Association in the twelve months of 1916 has been reached.

After a membership campaign carried on by the office of the Association during the year, stimulated from time to time by special appeals to the old members, the final fifty of the thousand arrived after the month of December had come perilously near its close.

The total membership is now 4350, which represents an increase of 50 per cent. during the last two years. The period in which this growth has taken place has been most unpropitious to the development of any society or movement not directly linked to the War. The promise of a much greater development after the declaration of peace is, therefore, very encouraging.

The distribution of the membership is approximately as follows: Ontario 1300; Quebec 800; Prairie Provinces 900; British Columbia 500; New Brunswick and Nova Scotia 500; United States and British Dominions 300. There are also 200 newspaper editors who are Special Members of the Association, not being subject to fees. The increase in membership, as noted, does not, of course, take account of any but paying members. The Association also sends packets of free copies of the Journal to Military Hospitals, Convalescent Homes, reading camps in the woods, camps of the forestry battalions etc., and to many prospective members thus bringing the total circulation of the monthly to 4700 copies.

While the great majority of members have no business connection with forests or forest industries and are giving their support solely from

motives of good citizenship and a personal interest in the beauty and utility of flourishing woodlands from the standpoint of camper, fisherman, hunter, etc., it has been a gratifying circumstance that during 1916 a large number of lumber, and pulp and paper firms, their officials and senior employees, became linked to the Forestry Association. Their assurances of interest in the work have been most hearty.

The loss in old members during 1916 was notably small. There were some cancellations of membership by death, a few by change of residence and inability of postal authorities to learn the new address, but fewer than fifteen in a total of over 4000 have voluntarily resigned.

It is intended that the Canadian Forestry Journal which has developed during the past eighteen months from 16 to 48 pages shall be further enlarged and much improved in point of appearance and contents.

To the many members who have given the Association splendid support in developing our numerical strength the Secretary wishes to express his hearty thanks.

### 400 Acres Planted.

Director of Forestry R. H. Campbell recently visited the Laurentide Company, Limited, plantations at Grand'mere, Quebec. There are about 400 acres of plantations all the way from one year to four years old. These consist of Norway Spruce and Scotch Pine in mixture; Scotch Pine; White Pine, and Norway Pine in mixture; and Norway Spruce in pure stand. The Norway Spruce has also been planted in the open under the shelter of White Birch and Poplar,



and also underplanted on land which has been logged over. The plantations are doing very well—the loss in Norway Spruce being less than one per cent, and all of the plantations are now beginning to show up in first class shape. A visit was also paid to a lumbering operation on land which had been heavily cut over for soft wood, the remaining stand consisting of large Hemlock and hard wood, mostly White and Yellow Birch, and Maple, and small Spruce, Balsam and Cedar. Practically all of the hardwood has been removed so as to give an opportunity for the soft wood reproduction to take place, and where this has failed, planting operations will be begun next Spring. Fire lines have been cut, and all the brush cut from them, and in cases operations have been burnt, and this has left the ground in good shape, and is a good example of what can be done along these lines. Mr. Campbell expressed himself as well pleased with the Laurentide Company's operations.

#### Wood Wharves vs. Concrete.

The Port Commission of Seattle, Wash., of which J. R. West is chief engineer, in answer to criticism on

the use of timber and pile construction in the Seattle wharves, has replied that wharves and freight sheds such as have been built by the port will have a life of probably from 20 to 25 years, which is also about the economically useful life of such a structure.

The Commission adds that conditions of water transportation are constantly changing, and this will render terminal structures obsolete after a certain number of years, this period being on the average about 25 years.

It has not been demonstrated that concrete made of Portland cement is permanent in salt water. If it does not prove to be permanent, then the added cost is not in any way justified, and if it does prove permanent then the physical life of a wharf would exceed its useful life, which is not economical.

Another argument in favor of the cheaper creosoted pile and timber construction which is particularly true of Seattle, says the Commission, is that a given amount of money can be made to produce more terminal facilities to invite new business than could be provided if the more expensive type of construction had been adopted.

## *Keep Woodlots Clear of Animals*

One of the most important steps to be taken in the care of the woodlot is its protection from fire and animals. Fire should never be allowed to run through it, for not only does this destroy seedling trees and injure large ones, but it also destroys the litter and vegetable matter on the ground and leaves the soil exposed to the drying influence of the sun and wind.

Pasturing animals in the woodlot is a great hindrance to the proper development. Cattle, in addition to eating off the tops of small trees, destroy the undergrowth and thus

allow the sun to act on the soil and grass and weeds to establish themselves. The result is the larger trees begin to slowly die at the top and decay sets in.

In woodlots that have in the past been neglected and now contain many more or less open and grassy spots it may be advisable to pasture hogs for a time in the fall. These animals by rooting about stir up the soil and put it in good condition to receive the seeds when they fall from the trees and thus a new growth of young trees is started.—B. R. Morton, B. Sc. F.



## *British Foresters in the Cameroons*

The following letter has been received from Mr. A. H. Unwin who is in the British Forestry Service in Nigeria, Africa. Mr. Unwin was formerly in the Dominion Forestry Service, and is a member of the Canadian Society of Forest Engineers. The letter is as follows: "In Nigeria I am in charge of the Working Plans Division, but since I came back this time I have been transferred to the British Sphere of the Cameroons (late German Colony) to report on the plantations and forests as well as the Agricultural resources. Needless to say the Southern Forests, such as I have seen of them, are grand with plenty of Mahogany of various kinds, besides Ebony, rubber and bullet wood, also ironwood. Most of the land is really covered with forest, except for the small clearings of the natives here and there. The Germans had not developed the timber industry in this part very much; in fact, compared to Nigeria, they had been very slow in taking up Forestry and only had six men in all, compared to Nigeria's sixteen at the same date. They had, however, done a certain amount of planting at the District Stations, chiefly with Teak, rubber Cocoa, Indian blackwood, as well as what they called German Steamer. I cannot quite make out what they meant by this. They had planned to plant in the drier regions away from the Coast, but little had been done before the war. Now we will hope they will not be allowed to return. Several large rivers for floating logs are found both North and South, notably the Cross River and the Mungo, as well as four other rather smaller ones, the Akwayefe, Ndian, Moko and Meme. On the whole too it is quite a mountainous country, the Cameroon itself being 13,000 feet high, and then there are several ranges, such as the Rumpi, 4000 odd, on which they are good stands of timber. The chief difficulty in dealing

with tracts is that there are so many different species on a given unit of area that it is almost impossible to make it pay with any great length of haul to a waterway. I have found as many as 73 species of trees in a valuation survey two chains wide and three miles long, and that is not a large number. The known species of timber trees regardless of shrub trees in this part is about 300, quite apart from the unnamed trees. It is like a vast arboricultural collection, all mixed up without labels, and overgrown with creepers and undergrowth into the bargain."

### **The Bird Treaty.**

All bird lovers will rejoice to know that a treaty has been entered into between the United States and Great Britain to protect migratory birds in this country and Canada. By three great highways the birds and the waterfowl pass back and forth between the two countries. One is along our Eastern Atlantic coast, another is by way of the land included in the Mississippi valley, the other is the Pacific slope west of the Rocky Mountains. There is also a northern, or breeding zone, and a southern, or wintering zone. While in passage, and while in the north or in the south our migratory insectivorous birds will have the protection of both governments, the game birds also will be protected under laws and regulations agreed upon.

The last two or three years have been wonderful years for the birds in the way of the legal protection obtained for them. On the one hand economy, claiming that toward a billion dollars a year is lost to the farmers because of insect pests, which the birds, if not destroyed, might largely have cared for, and on the other hand the sportsman, seeking protection for game birds that he may still have his unting season, have



joined with the real lovers of birds to bring this about. Wise men have long insisted that from the point of view of economy alone, the protection of our birds would ultimately arouse, as it has, the interest of the nations.—("Our Dumb Animals.")

#### New York To Buy Forests.

At the recent election the people of New York State voted to tax themselves \$10,000,000 for the purchase of forest preserves. The fact that this was not done by act of legislature, but by a referendum, shows how popular the idea of state forests has become with the people at large, says "American Forestry." The forest preserves of New York are not only of great economic importance for the preservation of the water supply and of local industries, but serve as an immense park which is visited annually by millions of people. Of the total amount voted, \$7,500,000 will be available for further purchases in the Adirondacks and Catskills, where the State owns already 1,814,550 acres of forests and lakes, and \$2,500,000 for the Highlands of the Hudson Preserve. A private subscription of a like sum had already been secured contingent on the passage of this proposition of the referendum. There will, therefore, be available altogether \$5,000,000 for the completion of a great interstate park in the Highlands of the Hudson.

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This splendid example set by a wealthy state will undoubtedly have a valuable influence on other eastern states. The fourteen thousand acres which the Vermont Forestry Department has acquired is a good start in the right direction, but it is only a drop in the bucket compared to the 3,000,000 acres of woodland in the State.

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## Fuel Value of Wood vs. Coal

The fuel value of 2 pounds of wood is roughly equivalent to that of 1 pound of coal. This is given as the result of certain calculations now being made in the Forest Service laboratory, which show also about how many cords of certain kinds of wood are required to obtain an amount of heat equal to that in a ton of coal.

Certain kinds of wood, such as hickory, oak, beech, birch, hard maple, ash, elm, locust, longleaf pine, and cherry, have fairly high heat values and only one cord of seasoned wood of these species is required to equal one ton of good coal.

It takes a cord and a half of short-leaf pine, hemlock, red gum, Douglas fir, sycamore, and soft maple to equal a ton of coal, and two cords of cedar, redwood, poplar, catalpa, Norway pine, cypress, basswood, spruce and white pine.

Equal weights of dry, non-resinous woods, however, are said to have practically the same heat value regardless of species, and as a consequence it can be stated as a general proposition that the heavier the wood the more heat to the cord. Weight for weight, however, there is very little difference between various species; the average heat for all that have been calculated is 4,600 calories, or heat units, per kilogram. A kilogram of resin will develop 9,400 heat units, or about twice the average for wood. As a consequence, resinous woods have a greater heat value per pound than non-resinous woods, and this increased value varies, of course, with the resin content.

The available heat value of a cord

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of wood depends on many different factors. It has a relation not only to the amount of resin it contains but to the amount of moisture present. Furthermore, cords vary as to the amount of solid wood they contain, even when they are of the standard dimension and occupy 128 cubic

feet of space. A certain proportion of this space is made up of air spaces between the sticks, and this air space may be considerable in a cord made of twisted, crooked, and knotty sticks. Out of the 128 cubic feet, a fair average of solid wood is about 80 cubic feet.—American Forestry.

## Cost of Clearing Land By Two Methods

### Experimental Farm Bulletin

When time is no object, the best way to clear land from timber growth is to let nature and live stock assist. When the growth is removed and the brush burned off clean, which, with most growths, may be made a profitable operation by the sale of the timber and fire-wood, clover and grass seed may be sown, and, while cattle and sheep are pasturing and eating down the sprouts, the stumps will slowly but surely decay, and their removal becomes an easy operation. This process will require from six to ten years before clearing can be completed.

At the Experimental Station, Fredericton, N.B., where it was desired to bring the land into cultivation at the earliest possible moment, two plans of stump removal have been tried, and herewith are given figures of the relative cost on land from which an average tree growth had been removed. The two methods employed were, stump pulling by power, and removal by dynamite.

A stump puller of the drum and long lever type was employed, giving a lifting power of 25 tons with an ordinary team. With one hundred and twenty stumps, 10 inches and over to the acre, and seventy-two smaller stumps, it required an average of twenty minutes with a team and driver and two men to remove each of the large stumps and 5 minutes to remove each of the smaller ones. The 120 stumps required 40 hours, and the smaller ones 6 hours.

The relative cost, therefore, stood as follows:—Where Power machinery was used, cost per acre was:

46 hours work team and driver at 32c .....	\$ 14.72
92 hours work helpers at 18c .....	16.56
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Where explosives were used, the cost per acre was:

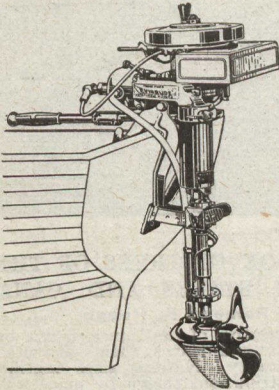
150 lbs. Stumping powder at \$14.90 .....	\$ 22.35
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40 hrs. labor of Dynamite operator at 23c .....	9.20
40 hrs. team and driver at 32c .....	12.80
80 hrs. helpers at 18c .....	14.40
60 hrs. labor piling at 18c ..	10.80
40 hrs. labor burning at 18c ..	7.20
	\$82.75

On other areas, where there were heavy boulders and small stones, the cost of clearing ran up to \$186.00 per acre, while, where the land was free from stone, and stumps were small and comparatively few, the land was made ready for the plough at a cost of less than \$40.00 per acre.



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## *How British Columbia Protects Forests*

In response to a request from the Canadian Forestry Journal the following summary of the advances made in British Columbia's forest management has been received from the Acting-Forester, Mr. M. A. Grainger.

"Since 1912 the chief advances in fire protection have been:—(1) Each license and lease holder has been assessed 1c per acre in 1912 and 1½c per acre in each year since, for forest protection purposes only. This Tax with an equal amount from General Revenue forms the "Forest Protection Fund." Previous to 1912 the Government paid directly all patrol and fire fighting expenses, and spent nothing on improvements.

(2) The creation of Forest Districts, now 10 in number, each in charge of a District Forester. He in turn is assisted by a number of rangers, from 2 to 6, usually employ-

ed permanently, and who are able to supervise closely the work of the temporary forest protection force. This gives close personal supervision of each man's work. In other words the supervision has been tightened up so that the management has close control of each employee's work. This is the most important thing that has been done.

### (3) Permanent Improvements.

#### *Area Under Patrol.*

(4) The area under patrol has been increased, from 123 million in 1910 to nearly 150 million acres. This increase is due to large areas in the north having been brought under some measure of patrol.

(5) Statistics of fire damage etc., have been standardized, so that results are directly comparable from year to year. More careful reports on all fires, however small, are de-



manded in order that statistics may be of the utmost value.

(6) Various economies have been effected, in modes of transportation, allowances, expenses, and in fire fighting.

(7) A systematic campaign of education has been conducted showing every citizen what he gains from forest industries, and how he may assist in perpetuating the industry by using care with fire.

About 11 million acres is taxed for Forest Protection purposes, and as previously stated, 150 million acres is patrolled. This Branch has always followed the policy of attacking fires at the beginning, no matter where they originated, whether on lands paying Forest Protection Tax or not. Owners of lands which do not pay such tax are required, however, to give their services, and those of their employees, free until the fire is extinguished.

#### *Slash Burning.*

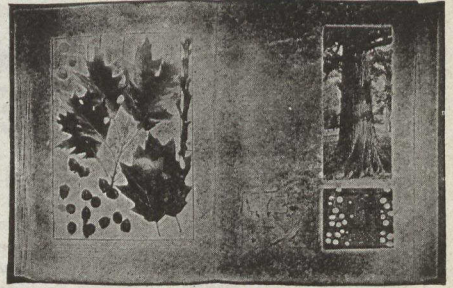
Slash burning is ordinarily not compulsory, although it usually is made so in the case of timber sales. Operators must, however, burn slash they make within 200 feet of a railway right-of-way, and in a number of other places which are considered particularly dangerous.

Any area of slash may be declared a public nuisance, if it endangers life and property, and the operator in such cases is required to make it safe, either by burning or by constructing a fire line. This provision has rarely been used, as better success has attended a campaign of education, many operators having voluntarily decided to burn their slash.

#### **Fire Undermining Canada's Position**

An interesting view regarding forest conservation is expressed by Mr. I. H. Weldon, President of the Provincial Paper Mills, Limited, Toronto, in an interview in the Toronto 'Globe':

"Conservation of Canadian forests, which includes, in Mr. Weldon's opinion, a restriction of the exports of pulpwood, cannot be too greatly emphasized. A cord of pulpwood shipped across the line to a mill in the



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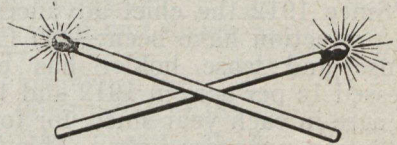
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States does not begin to benefit Canada as much as if that cord of natural product had been kept here for purposes of manufacture. Protection against fire, however, was the main factor to-day in conservation. "We will gain more to-day by preserving our forests from fire than by reforestation," was the way Mr. Weldon expressed himself. "After all, fire is destroying more timber than the lumberman is taking out, and if efforts are concentrated on stopping this waste by an improved system of fire-ranging the country will be greatly benefited and enriched in the days to come."

The future of Canada in the paper industry is unlimited. "In ten years," he said, "I venture to say that all the newsprint in America will be

manufactured on this side of the line. We have in Canada unlimited quantities of wood and an abundance of water and water-power. This country owns 40 per cent. of the world's supply of pulpwood, and yet we are producing only about five per cent. of the world's paper. The United States has eighteen per cent. of the world's pulpwood supply, and makes about forty-two per cent. of the paper. There is only one conclusion to such a situation." The big development, Mr. Weldon thinks, will be in newsprint, which offers the greatest opportunity to Canada for expansion. The scene of development in the immediate future, he thinks, is bound to be in territory lying directly south and east of Hudson's Bay.

## NEW METHODS NEEDED TO SUSTAIN FOREST PRODUCTIVENESS

### An Instructive Survey of Present Forest Management as Shown in Everyday Commercial Operations

*(Excerpts from an Address by Ellwood Wilson, F.E., before Technical Section of the Canadian Pulp and Paper Association)*

Our forests have been treated like mines from which we expected to draw all the raw material we wanted and if we ever gave the matter of their exhaustion a thought it was to say, "well the young trees are growing up all the time to replace those we cut." Unfortunately this is not the case for in a virgin forest the trees of different species which make up the stand have reached a state of equilibrium where the growth is balanced by the death and decay. On cut over lands, the shallow rooted spruce and balsam trees after being thinned out blow down in large quantities, the letting in of a large amount of light gives the hardwoods an opportunity of which they quickly avail themselves, to seed in, and the young hardwoods grow up so quickly that they crowd out the softwoods. In our examinations of cut over lands

we find that if left to grow for thirty years they will not yield more than three cords per acre which will make the cost of cutting them very high.

In Europe more than 100 years ago the same conditions that exist on this continent to-day confronted the people and after much experiment and many failures they learned how to look after their forests and we have the benefit of their experience. If we are wise we shall take warning and follow their example and adapting their knowledge to our different conditions we will take time by the fore lock.

#### *Stocktaking Needed.*

Already there is anxiety in the United States about the supply of pulpwood for the future and many firms are drawing on Canada and others have already provided them-



selves with large areas of our timber lands. The pulp and paper industry has grown by leaps and bounds and with the increasing uses to which wood pulp is put and the growing demand for it, we should take careful stock of our resources and utilize them wisely and with an eye to the future. A pulp or paper mill can not be taken down like a portable saw-mill and moved from one place to another as the supply of timber is exhausted, millions of capital are invested and only by long term operation can it be made to pay.

I do not wish to be taken for an alarmist and I am far from pessimistic but I do think it is time for us to stop guessing about the amount of timber we have, and to face the facts, make a careful inventory and utilize our forests intelligently. My own conclusions are based on facts, carefully ascertained.

#### *Why Costs Increase.*

The question of accessibility of wood supplies plays an important role in the cost of raw material, in the case of wood, the extra expense of taking men into the woods long distances, of transporting provisions first by rail then by sleighs and the long drives on the rivers all add to the cost per ton of paper. This difficulty has been aggravated by our methods of logging. At first all the timber was cut off around the lakes and along the rivers for say a half a mile and this was gradually extended until the haul became too long to be economically possible. Also timber in difficult places was left. The usual method of logging which is still in force nearly everywhere in Quebec is to let a contract in a predetermined district to a jobber for a certain number of thousand logs. The number of logs that can be cut is guessed at and is finally settled by compromise with the jobber. Usually there is more than enough timber in the district assigned him and he proceeds to lay out his roads radiating from his headquarters and to cut as close to these roads as possible often leaving quite large amounts of timber between them, which necessitates going back to this same section again and

as the timber left is the most difficult to get out a higher price must be paid.

Unfortunately, until within the last six years the river drivers invariably set fire to the slashings in the spring and burnt off the timber, so that one could not go back at all. The course of practically every drivable stream is burnt and I estimate that about 30 p. c. of the St. Maurice Valley has been burnt over in the last fifty years and about 16 p. c. of this area has not yet commenced to reproduce and the balance will not produce a crop for many years.

#### *Composition of Forests.*

The condition of the forests is a matter about which the average man does not have any very clear ideas. In the first place we have very little forest which is composed of just one species. In swampy places we have pure stands of black spruce, growing thickly, hardly ever attaining a larger size than ten inches and most of the trees of great age owing to the unfavorable conditions of growth. I have often seen trees five inches in diameter over one hundred years old. Then on sandy plains we have dense stands of jack pine which has usually come up after a fire and which is so crowded that the trees are very tall and spindling and will never reach commercial size. On large areas too, over which fire has passed we have stands of aspen and white birch neither of which trees growing under such conditions have much merchantable value as they seldom reach large size, are generally diseased and comparatively short lived. Our really good forests are composed generally of balsam 61 p. c., white birch 17 p. c., white spruce 15 p. c., black spruce 4 p. c., maple 2 p. c., cedar .5 p. c., other hardwoods .45 p. c. and white pine .05 p. c. Of this about 32 p. c. of the total stand spruce and balsam can be cut above the Government diameter limit. The way the cutting has been carried on in the past most of the white and black spruce and some of the balsam has been taken off. Where a good deal of light has been let in and conditions were otherwise favorable the balsam has come up in dense groups in which



the struggle for existence is so great that the trees rapidly become diseased and the resulting stand is of small value. Where the conditions are more favorable for hardwood reproduction these trees seed in thickly and make it very difficult to obtain reproduction of softwoods. Our present methods of cuttings are slowly but surely turning our forests from coniferous to hardwood ones and the coniferous will have a difficult time to re-assert their supremacy over the broad leaved trees. We are leaving the whole matter to chance and unquestionably our forests are deteriorating. The leaving of the debris from lumbering not only increases the

fire hazard but provides ideal conditions for the growth of harmful insects and fungi. It is in a sense like leaving unburied corpses in a community.

*Science in Logging.*

Now the aim of the forester is to regulate all these matters. The proper cutting of a forest, unless it is cut clean, is a matter which requires experience and above all, good judgment, the balance is delicate and the result of a wrong system of cutting often take very many years to correct. The ideal at which we aim is to make every acre bear as many trees as it will carry of the most useful sorts for

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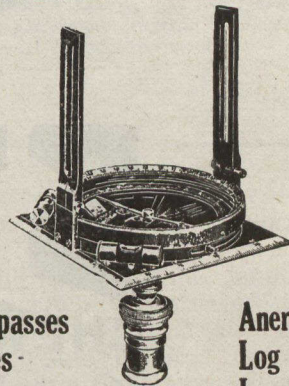
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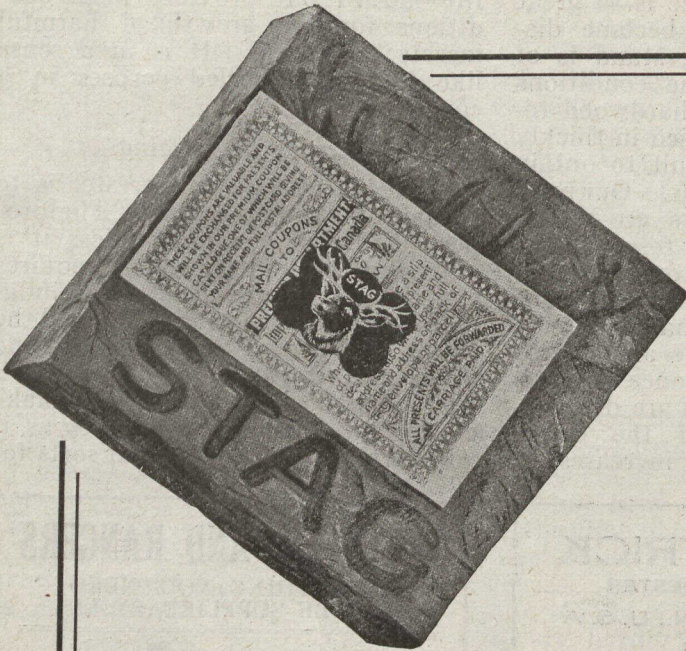
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the purpose in view and to keep up a sustained yield. This may mean that more trees must be left than under the present system with a slight increase in present logging expenses but a large decrease the expense in future operations. In changing over from an unregulated to a regulated forest the expenses for logging will be larger for the first felling but thereafter should gradually decrease as the stand of merchantable timber increases.

We also want to utilize every possible tree. At present we have a large amount of hardwood which is left in the woods and as I have said before hinders the growth of the coniferous trees. It is quite possible to use this for pulp with the soda or sulphate processes but I understand that it cannot be utilized with the sulphite process. I visited a mill in Austria which used beech entirely and made a good quality of pulp. There is, it seems to me, no reason why hardwood should not be used for ground wood; the fibre is, of course, shorter, but it ought to make a good filler. The objections are that it is difficult to float and some difficulty might be encountered in barking it. The first difficulty can



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be overcome by spring cutting and the second might be overcome by peeling in the woods as is done with poplar. This would lengthen the time over which our supply of spruce and balsam would last and add much to the value of our timber limits. The Laurentide Company in cooperation with the Forest Products Laboratories hopes to try some experiments along these lines this winter.

### 31,000 Cords Wasted.

Then there is the elimination of logging wastes which are at present larger than they should be. The lumber companies usually take logs from a tree until a diameter of six inches is reached but the pulp companies take down to four inches. However, a very bad custom still holds of using logs thirteen and one half feet long and as it is often impossible to get a log that length out of a tree top much good wood is wasted. We have measured up over two thousand tops and we find that in the St. Maurice Valley about 31,000 cords of wood are wasted each



season. Then too stumps are cut far higher than is necessary and the waste from this source approximates 10,000 cords per annum. A large amount of good pulp wood is wasted in building camps for the men and much is still used for roads although this last waste has been much reduced.

In the mill we still have sawdust, slivers, bark and the waste liquor to find profitable uses for.

### Dividends from Planting.

With the growing scarcity of timber and the increasing distance one must go for it with a corresponding increase in costs, our attention must turn to planting: a plantation offers the following advantages. A much smaller area of forest since in planting we use all the land and having only the useful species our yield is very much increased, eight to ten times. The lands near the mill can be utilized and instead of river drives of one to two hundred miles we would have only twenty-five or thirty miles and logging railroads could be profitably built and the wood brought from

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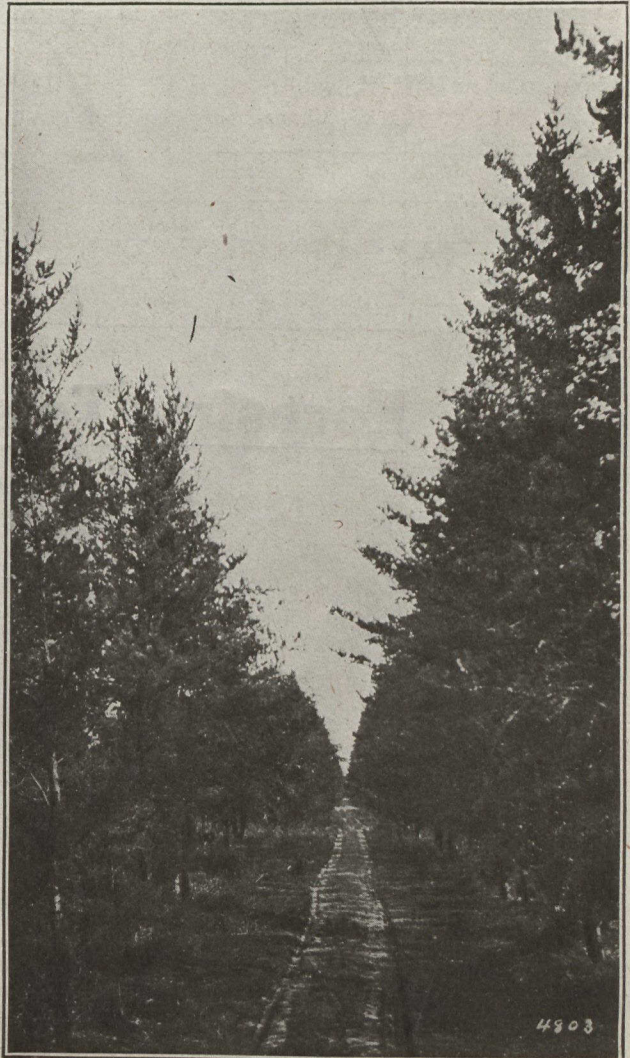


the stump to the mill doing away with our huge wood piles, with the expense of piling and unpling, the loss of interest, the deterioration of the wood and the danger from fire. With our timber areas concentrated the expense of fire protection and administration would be much reduced and labor afforded for a large number of men. Owing to the much larger amount of wood per acre the logging costs would be much reduced and as only the best trees would be allowed to reach maturity the quality of the wood would be much improved. We would have a steady supply for all time and a uniform cost figure and

by having our forests near the mill means could be devised to use up the branches and probably even the needles so that like the packing industry which uses everything of the hog but the squeal, we could use all of the tree but the smell.

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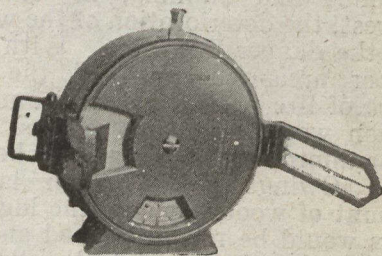
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