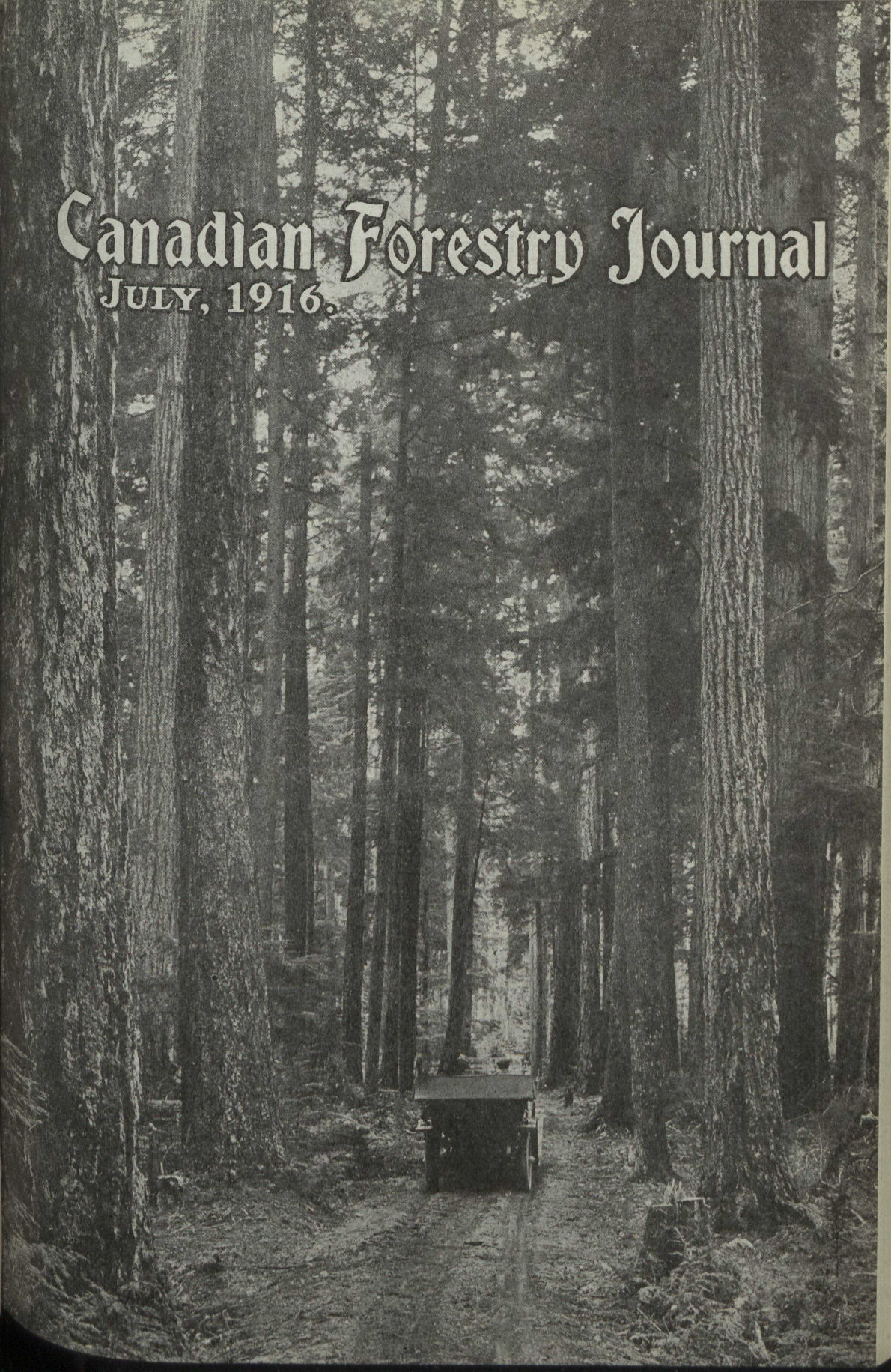
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The Forest Resources of Serbia

Great Development Promised in Near Future When Railways and Cableways Overcome Handicaps on Driving.

Without taking into consideration her great agricultural and mineral resources, Serbia would still be a very rich country, merely through the possession of her forests. Hitherto this forest wealth has been little utilized, owing to the lack of communication between the forest areas and the sea, although the actual distance is comparatively short. The reason for this lack of development is due to the very rugged topography of the country which makes road construction very difficult and expensive. However, the country owes its forest resources in a great measure to this same fact, for doubtless if the early Egyptians, Syrians, Greeks, Carthaginians, Romans, Byzantians and Venetians, with their immense demand for ship building and construction material, had been able to reach the forests of Serbia, they would have stripped the mountains bare with the same recklessness as they did those of Greece, Asia Minor, Spain and Italy, whose bald mountains and hills to this very day speak eloquently of the depredations of those early peoples.

Apart from its later acquired territory, says a writer in "The Timberman," the old kingdom of Serbia, possessed only two channels for the export of timber: the broad but very shallow Morava in the interior and the Drina, which forms the Austro-Serbian boundary. Both of these rivers flow into the Danube. Only upon these rivers would it have been possible to drive the timber cut in the mountains. But the Danube flows as the Austrian says, "the wrong way." It leads from the central point of demand in the interior of Europe to the Balkan states. Countries such as Bulgaria, Roumania and southern Russia have at their disposal extensive forests close at hand while Asiatic Turkey, up to this time has had little use for lumber. The streams which flow through Central Europe, the Bug, the Weischsel, the Warthe and the Memel, carry large quantities of timber down stream, while operators along the Danube are handicapped by an upstream tow, and its attendant high freight charges. It is therefore easy to understand why Serbia has played no great role in the exportation of timber and forest products and up to this time has cut only such material as is required for domestic consumption.

The government began some years ago to requisition small amounts of firewood and ties for railroad construction in Moravatale, near Kruschenwatz. In the valleys and heights of the Tarage Mountains, working up to an elevation of 2,000 feet, on the tributaries of the Drina, the Traders' Bank of Belgrade has carried on considerable logging activities with home capital. The bank understook building operations and erected a mirror factory as well as a large sawmill in Belgrade, where the logs coming down the Drina and Danube are cut for the domestic needs of the country. Prior to the war, a large part of the output of this mill was box material, which the export trade of Serbia required for the shipment of agricultural products.

There has been no great activity in the lumber industry in the newly acquired parts of Serbia. The development of those regions has been hindered for decades, by the uncertainty of the political conditions in the Balkans, which has not been removed by the passing of these territories into the kingdom of Serbia. As a consequence of which foreign capital could be raised only for the exploitation of the rich mineral resources such as copper, manganese and gold. Such capital as did enter Serbia in recent years came chiefly from France.

The forests of Serbia are for the most part, virgin stands of mixed species. The varieties are seldom found in pure growths. The lower elevations are for the most part covered with white beech, while the finest fir and pine stands are found at considerable altitudes. It is lamentable that the lower part of the trunks are in many instances ruined by a practice of the shepherds, which has been carried on since the history of man. This consists of building fires on the lee side of the pine trees directly against the trunks. The flow of resin which exudes from the tree in an effort to efface the scars, in turn gives the shepherd the best sort of kindling with which to light new fires.

New forestry regulations have never been enforced in Serbia. Now and then there has been an order for the complete removal of forest covering in various parts of the country, where it was deemed that the land was more suited for agricultural or grazing purposes. The government imposes a cutting tax upon such timber as is removed, the measurements being determined by forest officers.

The principal difficulty, even in supplying the meagre requirements of the domestic consumption has arisen from the lack of transportation facilities. The mountains on which the timber stands, are often rugged and broken and the rivers which issue therefrom are consequently crooked and hemmed in with rocks, which make driving very difficult. Railroads and highways in many sections are almost entirely wanting. Logging operations can be carried on only along the larger streams.

The timber is removed from the mountain slopes usually by means of chutes running to the rivers. Sled roads are built along the mountain sides over which the logs are hauled to the edge of the inclines. Hauling is done only in the winter when the snow is of sufficient depth. Oxen are used chiefly on the sled roads. Where the topography is more favorable, horse trucks are sometimes used. These trucks are operated over wooden tracks. One of the log chutes built by the Traders' Bank is one and a half miles in length, raised at the lower end to check the speed of the descending load. The logs are stored at the end of the slides from whence they are rafted down stream.

In some localities, the Bleichert system of cable-way transportation has been used with great success. These cable lines are of great service in the rough country. The lines often swing for hundreds of yards over valleys, penetrating mountain walls through tunnels, and making sharp turns. The cable-ways also serve for the transportation of men and supplies and special carriages have been designed for the purpose. One of these lines which is operated by the Traders' Bank of Belgrade has a drop of nearly 4,000 feet in six miles It is constructed with stations at various points. This company found the Bleichert system of great value as the stream in this particular locality, before entering into the Drina River, narrows down to less than seven feet in width, flowing with great rapidity through this box canyon and making driving impossible.

Without a doubt in the near future, Serbia will win a way to the Adriatic, across Montenegro and Albania. Railroads, although difficult of construction, but short in length, will carry a wealth of traffic, a large share of which will be lumber products. When these are built, Serbian timber will begin to play an important part in the European markets. The initial stages of development will take care of the needs of the Mediterranean countries. The success of lumbering operations recently undertaken in nearby Bosnia, catering to this trade, make the future for the Serbian lumber industry very bright. It is believed that Serbian lumber will displace to a great extent the material imported from Norway, Sweden and Russia, especially in Southern Europe and it is even hinted that the other lumber markets of Europe will feel the influence of the activities in this region.

Eight Settlers Burned Out

(Victoria, B. C., Times, June 9.)

Advices to the minister of lands from the Fort George forest district point to the exceedingly hazardous fire situation prevailing in that country, and extending throughout the northern interior generally. While showers fell during the early part of last week, they were insufficient to curb the dangerous conditions, and were followed by a return of the hot weather, with gales previously reported. The dry soil cover continues to supply a factor of much concern, owing to the retarded vegetation.

Many fires are reported, both on non-timbered and timbered lands, the efforts of the forest officers being mainly directed to saving the latter. Three million feet of timber have been destroyed at Willow River. Other damage included the destruction of thirteen cabins at Alza Lake and eight buildings at Chief Lake, many people being destitute in consequence, and some have barely escaped with their lives.

The majority of the outbreaks have been ascribed to accidental origin, as well as to the work of incendiaries, only a few being so far traced to the clearing operations of settlers. As a precautionary measure, fire permits have been cancelled in the dangerous sections, and one arrest has already been made for violation of the fire law. In a later telegram the situation remained unrelieved, although rain was threatening. Eight more homes are reported to have been destroyed. Eight settlers burned out

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Germans Use Paper Beds

Paper beds, with paper sheets and paper pillow cases, are now being used in Germany by the poor. The material for mattresses and bedding has become so dear that it is impossible for any but the comparatively rich to afford them.

The mattresses are now made of strong sheets of paper pasted together and filled with dried leaves of beech and oak trees. These leaf mattresses are said to be as comfortable to lie on as any filled with feathers.

The paper used is toughened by a special process, which prevents tearing easily. The leaves for filling the mattresses and pillow cases have been collected in the great German forests by bands of children at a practically negligible cost.

Would the Ontario Settler Object?

Would the Ontario settler object to a system of 'permits' issued by forest rangers for the burning of his clearing slash? Settlers in Quebec and British Columbia are contentedly co-operating with the provincial forest administrations under the permit system, with the result of enormous savings in timber and greater safety to the farming communities.

Would the Ontario settler object?

Read what the Ontario Department of Lands and Forests says on page XI of the 1915 report:

"In the Port Arthur district there were several fires caused by settlers clearing land. About 200 acres of small timber was damaged, 13 SETTLERS LOSING THEIR EFFECTS AS A RESULT OF THESE FIRES."

Would the Ontario settler object?

Market For Canadian Lumber in Cuba

The following article, forwarded the Department of Trade and Commerce, Ottawa, by Mr. J. C. Manzer, special representative of the New Brunswick Government in Havana, will be of interest to Canadians, showing as it does the wide market in Cuba for lumber, and the part that this island is taking in the industrial activity of the world.

Cuba imports annually about 600,000,000 feet of lumber. This consists, for the most part of pine, spruce and fir, and is imported in the form of inch boards, running from six inches to twelve inches in width; planks two and three inches thick and of various widths, and deals sawn to various dimensions to conform with orders received. This is shipped just as it comes from the saw without being planed, and when imported in this form is not subject to duty.

The greater part of this lumber comes from the United States, principally from the gulf of Mexico ports, but Canada supplies a large quantity which might be increased to a great extent.

A large part of this lumber is brought here on schooners, but since the ferry service between Cuba and Key West has been in operation, considerable lumber from Florida and Georgia is shipped by rail. This lumber on arrival in Cuba is taken direct from the docks to the mills, where it is planed and made ready for building purposes. It is then shipped to all parts of the island.

The increasing prosperity of the island has largely increased the demand for lumber of all kinds, but lack of vessels has prevented the necessary supply from being obtained, and consequently has curtailed building operations to a great extent.

The labourers in the cane fields, now that they are getting more pay for their work are no longer content to live in houses constructed of palm leaves, but are constructing wooden houses which are much more comfortable. The clerks in the business houses, many of whom have been living in small poorly ventilated rooms in the crowded parts of Havana, are now getting building lots outside the city where they are constructing houses, mostly of wood, where their families can enjoy the fresh air and sunshine. The business men are also building residences in the suburbs, mostly of brick or concrete, but even these require large quantities of lumber for doors, windows, staging, moulds for concrete, etc.

Spruce and pine from New Brunswick, Nova Scotia and Quebec; also spruce, fir, hemlock and cedar from British Columbia would be suitable for all building purposes in Cuba. Besides this class of lumber Cuba imports quantities of shingles, thousands of crates for fruits, shooks for packing cases, stave heads and hoops for making barrels, and large quantities of broom-handles.

Canadian pine, spruce and fir would be quite suitable for the manufacture of fruit crates and packing cases. These are imported cut in exact lengths ready to be nailed together, and tied in bundles. Birch, maple and ash would be quite suitable for barrel heads, staves and hoops. These arrive tied in bundles, and when put together are used for packing beer. Canadian yellow birch and maple make the best broom-handles.

Canadian lumber will fill nearly all the requirements of the building trade in Cuba; and as Canada is a large seller of lumber while Cuba is a heavy buyer, it would be advisable as soon as the war is over, and conditions become normal again to make an effort to secure a larger proportion of this Cuban lumber trade.

Sowing Forest Tree Seeds

The Earl of Selborne, president of the Board of Agriculture, has communicated with the members of the Royal English Arboricultural Society through their president, Lord Barnard, urging the need for sowing forest trees this year. Even small sowings, he says, would be useful, for in the aggregate a large number of seedings might result, and he specifies the trees likely to be most in demand, after the war, namely, larch, common spruce, Sitka spruce, Scots pine, Douglas fir, silver fir, Corsican pine and beech. Lord Barnard heartily supports the appeal.

Experimental Plots

The Laurentide Company, Ltd., of Grand' Mere, Quebec, has a large tract of land, at present about twelve hundred acres, devoted to planting and experimental cutting operations. Different systems of cutting are being tried out and experiments in natural regeneration also. In all these thinnings or cuttings the slash is piled and burnt. Plots have also been marked off and all the trees numbered and a band painted about them at breast height, and each year the diameter growth is measured. Plantations have been made not only in the open but under different kinds of stands and on different soils. Experiments in draining swamps are also to be undertaken and a system of good dirt roads and fire lines is also kept up.

A Progressive Move

The Canada Paper Company, Ltd., of Windsor Mills, Quebec, intends to cut fire lines and clean up the debris on their holdings this spring. This company is especially fortunate in having freehold lands within easy reach of their mills and they are in a position to get the greatest possible value out of forestry methods. It is the intention of this company also to plant up their waste lands and lands not fully stocked.

Riordan Company Planting

The Riordan Paper Company of Montreal have decided to commence planting operations on their limits, and their forester, Mr. Volkmar, has been investigating the plantations and nursery methods of the Laurentide Company of Grand' Mere. It is interesting to note how the progressive paper companies are taking up the planting idea and there is no question but that such a policy will prove highly productive in the long run.

Canada's Maple Sugar Industry

There Are 55,000 Makers of Sugar and Syrup in the Dominion, Holding 1000 Square Miles

The possible money value to Canada of the maple industry is far greater than is generally supposed. There are at present no less than 55,000 makers of maple sugar and syrup in the Dominion. Allowing a ten-acre bush to each farmer would mean that 550,000 acres, or about 1,000 square miles, are being reserved in their natural wooded state, a most important matter for the conservation of our springs and rivulets. In this large area, no less than two-thirds is situated in the province of Quebec. There are a few sugar bushes in Ontario and a negligible number in the Maritime Provinces. For some inexplicable reason it has never been realized that we have in Canada millions of acres of maple bush running from the north of Lake Superior to the shores of New Brunswick and Nova Scotia, all standing in their primeval condition, waiting only to be tapped to yield to the world its remarkable wealth. When it is remembered that it is only in the border states of New Hampshire, Vermont and Maine that the sugar maple grows within the United States, and that with this exception, we in Canada possess the whole world's supply, the great importance of the industry will be realized.

Two Millions Worth.

It is estimated, says the Montreal Journal of Commerce, that in 1915 Canada produced two million dollars worth of maple syrup and sugar. In 1911 the output in the Province of Quebec was valued at $1,680,000, a sum 14 per cent greater than the production of our small fruits; considerably greater in value than the sheep sold, almost equal to the sale of our poultry, exceeding that of our whole output of cream, and six times the money obtained from honey and wax. These comparisons serve to show the relative importance of our maple industry, the possibilities of which are too great to estimate, if the immense woods of Ontario and the Lower Provinces were cultivated as they should be.

A peculiarity of the situation is that there is practically no demand outside of North America for this commodity ,and for no other reason than that no effort has been made to make it known to the countries beyond the seas. Needless to say, once the exquisite flavor has been discovered by the millions abroad, there will be no lack of demand for this essentially Canadian product.

U. S. Takes All Export.

At the present moment our chief export market is in the United States. During the five years from 1908-1912, 99 per cent of our exported maple sugar went to the Republic and 50 per cent of the syrup. During these five years we exported altogether 8,685,000 lbs of sugar and 20,000 gallons of maple syrup, a mere bagatelle in comparison with our capabilities. In May of this year the United States will remove their customs duties upon both our maple products, thereby opening up to us a market that without exaggeration may be termed unlimited, for at the present rate of production we could not possibly supply the demand of 100,000,000 people.

On April 15, 1915, after our last yield of sugar had been gathered in, an Act was passed at Ottawa to amend the Adulteration Act. This is a simple statement and gives but little idea of the struggle and con-

troversy that has been going on for years before it was possible to persuade parliament to protect the industry against fraudulent manufacturers. For a long time, city manufacturers, who never went near a maple bush, have been putting up a mixture of cane, sugar and water flavored either with a small percentage of maple syrup or with an essence called "Mapleine." These syrups and sugars were labelled with such names as "Maple flavor syrup," "Maple compound," etc., while many were not labelled at all. From the following table will be seen the extent to which this systematic adulteration has injured the maple industry, more especially since 1890.

Years.	Production of Sugar lbs.
1850-60	135,000,000
1860-70	175,000,000
1870-80	190,000,000
1880-90	225,000,000
1890-1900	212,000,000
1900-10	196,000,000

Adulteration Stopped.

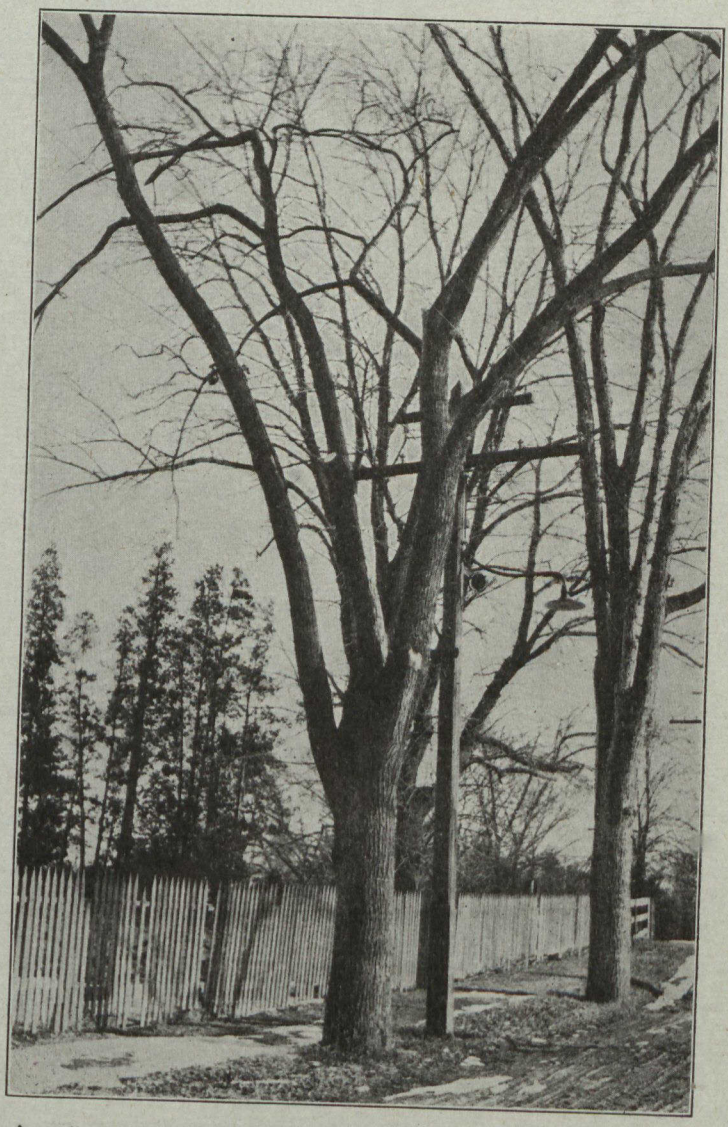
In 1900 the first steps were taken in protest. In that year, 2,000 sugar makers signed a petition which they presented to the Hon. Sydney Fisher, then Minister of Agriculture. The difficulty at that time was the impossibility of obtaining chemical tests whereby cane and beet sugar could be detected in the maple product. In 1904 the Agricultural Department of the State of Vermont discovered that by using subacetate of lead they could determine if maple sugar or syrup were adulterated. This was of material assistance to our Inland Revenue Department, and in Feb., 1915, a bulletin was issued giving the results of chemical tests on a number of syrups and sugars. It was found that 76 per cent of this collection was adulterated and only 24 per cent pure. The publication evidently had a beneficial effect for in May of the same year, a second test was made which showed a decided improvement, only 34 per cent being adulterated. From that time the Department has issued annual bulletins, but, finding it impossible to stop adulteration, the act already referred to was placed upon the statute books. A most gratifying result is shown in Bulletin 325, just recently issued although dated October, 1915, according to which only 15 per cent of the samples were found impure. On looking over these pamphlets from year to year the names of the same offenders occur again and again. Evidently the policy has been to pay the annual fine and proceed as before. Prior to April, 1915, the fine was merely nominal, but under the new regulations it is to be hoped that an end will be put to the fraud.

The Word "Maple."

The amendment of the Adulteration Act prohibits the manufacture and sale of adulterated maple syrup or sugar, and restricts the word "Maple" to pure maple sugar or syrup, imposing a fine of from $50 to $500 and costs for wilful adulteration; and from $50 to $200 and costs for the sale of the adulterated article.

While the fight has apparently been won, it is felt that only by eternal vigilance will it be possible to protect the honest maker. Those who have been instrumental in bringing about these important reforms are naturally much encouraged and feel that the maple industry stands on the threshold of a great development, with the unlimited markets of Great Britain and the United States lying before it.

Messrs. D. A. Macdonald and C. H. Morse, of the Dominion Forest Service, have been elected associate members of the Canadian Society of Forest Engineers.



According to a writer in "American Forestry" this imperfect elm is worth $51.96. On the author's system of calculating tree damages, the high tension wire passing through the branches greatly impaired its value and will still further impair it. If it was in perfect condition it would be worth $181.54.

Odd Conditions in Nigeria

Close Supervision of Cutting in these Tropical Forests With View to a Continuous Production

By A. H. Unwin,
Member of the Canadian Forestry Association

European forest officers are of two ranks, the scientifically trained conservators of forests and the executively trained foresters.

The scope of this paper will only cover the former, as very few of the latter are European, and most of them Nigerians.

From Oxford, Cambridge and Edinburgh, graduates in forestry can usually be procured. The training at these centres covers, roughly, a year or a year and a half's work on the elementary subjects, such as botany, mathematics, geology, mensuration, surveying, and political economy. In addition, a year or two years' work on the professional subjects, silviculture or the growing of forests, forest protection, forest utilisation, forest botany, forest entomology, forest history, and forest policy, is required. At the end of the course six months' practical work in Scottish or English forests follows, during which period working plans and market conditions are especially studied.

The Training Course.

After being accepted for appointment in Nigeria, a further three months' course is taken at the Royal Gardens, Kew; and six months' practical work on the Continent was (before the war) usually required. At Kew the object is to acquire a working knowledge of the most important botanical orders which contain the African trees. The Continental course shows the student forests which have been under a definite scheme of management for over a hundred years. It takes one, in fact, through the life history of a tree from a seedling in the nursery bed to the well-grown financially mature tree, marked ready for the axe, a period of about eighty years.

The initial appointment is for three years on probation, after which it may be confirmed. The initial salary of an assistant conservator of forests is £300 per annum, rising by increments of £15 to £400 per annum. The first appointment dates from the day of sailing, the passage being paid by the Nigerian Government, and salary on half-pay begins from the date of departure until the arrival in Nigeria, when full salary begins to accrue. Intending candidates should bear in mind that an early selection for appointment entitles them to seniority over other candidates who, owing to their being fully qualified, are appointed immediately, and thus reach the colony before them. Locally, a commuted travelling allowance of £42 per annum is drawn to compensate for the extra cost entailed in inspecting the forests. A limited number of carriers, or other means of transport, are provided by the government. For the purpose of more rapidly getting about, a bicycle, motor, or horse may be kept, and an allowance is given for maintenance. The cost of living is high, even when furnished quarters or a bungalow are provided.

Reaching Headquarters.

Lagos is the first port of call in Nigeria, and there is a railway journey of 123 miles before reaching Ibadan, the temporary headquarters of the Forest Department. Oloke-

meji, ninety miles from Lagos, is the old headquarters, and here the forestry work of the Southern Provinces is directed. Zaria, situated some 450 miles from Lagos, is the headquarters of the Forestry Department in the Northern Provinces.

A newly appointed officer would be liable to be sent to either of these last-named places; but owing to the larger number of men being stationed in the Southern Provinces, the majority are sent to that centre. Olokemeji is in the middle of a forest reserve, 26 square miles in extent, and is also the headquarters both of the Western Circle and of its Northern Division. In each circle there is a conservator of forests in charge, and he has an assistant to manage each divison. In the event of a shortage of staff it may happen that a new man is put in charge of a division, and thus has an opportunity of learning all about the work much more quickly than would otherwise be the case. In the ordinary way he only corresponds with his conservator and the timber interests of his division on purely local matters.

The Tricks of Carriers.

At first sight, on examining the tropical forest, it appears like a very mixed collection of different kinds of trees; on closer inspection, however, similarities and contrasts are apparent, such as ebony, with its thin, black, scaly bark, and that of the somewhat regularly, deeply fissured bullet-wood tree, and its white latex, which the former does not exude.

In walking through a forest it is normally best to make the carriers precede, though their scent is not entirely pleasant if one is close behind. Owing to their tendency to lag, and their desire to sit down at inconvenient times, it is an advantage to have them in front. Frequently one may have to stop and examine a flower or leaf, and it only adds to the carriers' labour if the whole column has to stop whilst seeds and specimens are being collected. A march of about fifteen miles is sufficient, and takes up the better part of the day if an examination of the forests is being made on the way. In most parts villages are eight to ten miles apart, sometimes nearer, so the carriers can stop and purchase food. In the larger forests, however, a distance of over twenty miles is sometimes covered without sight of a house; in that case, the people of the last village are asked to bring food for the carriers, and the carriers themselves are given a day's food as well, which has to be cooked on reaching camp. In some places the chiefs provide food (yams etc.) which is distributed to the carriers, or in some places 3d a day per head is allowed them for purchasing food. So long as the carrier gets food ,and his load is not excessively heavy, he is quite cheerful and walks well.

Nigerian Wages.

Current wages vary from 9d. to 1s. a day, the headman getting from 1s. to 2s. a day. Local felling permits being issued both by the district and forest officers to natives for felling timber for local use, at district stations a call is paid to the District Officer to discuss current forest questions and examine the permit books. At the same time there is an opportunity of seeing what further development of forest work is possible in the district. The local forest guards, foresters, or forest rangers report themselves, usually giving a very good account of the local forest conditions. Since the demand for local timber has been growing, a stop may have to be made to supervise the marking or girdling of suitable trees for bridge building under the auspices of the Public Works Department. On a journey through the mahogany forest, the different camps of the timber firms have to be visited. These firms have hundreds of square miles for the pur-

pose of exploiting mahogany and furniture woods. At the same time the checking and inspecting of the stumps of all these trees felled has to be gone through. The young mahogany seedlings are also seen, and from the number of these it is known whether sufficient have been planted to take the place of those cut down. The very rapid growth of these trees can here be studied to advantage; trees now 40 feet high have only been planted a few years. The relative value of the direct planting of seedling trees as compared with the natural regeneration of the forest by self-sown seedlings can be observed with ocular clearness. In one part of the forest one sees natives standing on a platform hacking away with an axe into a huge 50 foot mahogany; in another place a similar tree, fallen, its 90 foot bole already sawn into three round logs, while in a third locality may be seen a native, axe or adze in hand, squaring mahogany logs with a four foot side. Later in the season eighty or more natives are engaged in dragging one of these logs on round billets of wood (for rolers) along a track, roughly cleared to the height of a man, to the nearest natural waterway; still later (that is, in July or August', when the rivers rise, the logs may be seen floating singly down to the rafting place on the main creek, where rafts are made with logs four or eight abreast, each fastened to the next from a timber dog at either end, with cane. From here riverine natives, such as the Ijors, take the logs to the nearest river or ocean going steamer port.

The Timber Market.

The Forest Department has supplied the Railway, Marine, and Public Works Departments with timber of various kinds. In some cases the timber is obtained by departmental working, and in others is cut by native contractors under the supervision of the department. In the first instance, the conditions under which timber is to be supplied to other departments are put before the Secretariat, and, when once the work has been begun, the local forest officer deals direct with the department concerned.

Forestry progress in Nigeria has been less tardy than in several other colonies, though many forests have been destroyed owing to lapse of time before the formation of a department. In 1904 there were eight, and there are now 24 administrative appointments. The amalgamation of Northern and Southern Nigeria into one administration should accelerate the development of forestry. It is as yet only in its initial stages, and scarcely more than a thousand square miles of forests, out of nearly a hundred thousand which exist in some form or other, have been permanently set aside for further timber production. The revenue-earning capacity of the Forest Department has been somewhat diminished by the war, but with recent legislation more local revenue should be obtained, which should more than off-set any loss already sustained. Provided the financial position of Nigeria remains strong, the prospects of the Forest Department are quite bright.

Although Nigeria has by far the largest Forest Department, very similar conditions of service obtain in the other West African colonies of the Gold Coast and Sierra Leone; but there are no forest officers in the Gambia.

Civil Service Efficiency

"The civil service of Canada," says the Ottawa Citizen, editorially, "has many able and fearless and conscientious men and women in it. What an asset it would be to this country to have its civil service free from the menace and molestation of patronage ministers, who really reflect a bygone age of barbarism and not the science of government as it is understood in this the twentieth century. It is only necessary to review the immense service the Auditor General has been, and still is, to Canada, to get a glimpse of how much better off the Dominion would be if the entire civil service were elevated to the same plane of economic security and freedom from patronage domination. The Canadian public should welcome any movement to put the civil service on a better basis. Could such a movement not be initiated from within the service itself?"

It has been pointed out frequently that the outside service of the Dominion Forestry Branch can be brought under the merit system of the Civil Service Act without new legislation. Were such action taken it would remove one of the worst drags on efficiency which the country is compelled to carry.

Mr. Ellwood Wilson, Forester of the Laurentide Company, recently made a trip to an aeroplane factory to examine aeroplanes and see if they would be practical for forest fire ranging work. He reports that while for finding fires they are entirely practical, they are so difficult to launch and to land with at present that they are hardly practical as yet. "A suggestion made by someone that clearings of seven or eight acres in extent be made at convenient places in the forest for landing and starting is out of the question, as such clearings would be too expensive to make and keep clear, and the great value of the aeroplane would be its ability to travel fast, see over a large area at once, and to alight near a fire and extinguish it. This latter is the most important and the most difficult thing for an aeroplane to do. Of course, a flying machine travels so fast that a fire could be reported without delay, but by the time a crew was organized and transported some fifty or one hundred miles the fire would have gained a big start. It is certain, however, that these disadvantages will soon be overcome and the necessity for lookout towers and slow-moving rangers will be done away with."

Lectures at Summer Resorts

The Secretary of the Canadian Forestry Association will deliver a series of "Forest Travelogues" at the largely populated summer resorts of the Muskoka Lakes and Georgian Bay, during the last week of July.

Arrangements have been made for the following itinerary:

Minnicoganashene, Georgian Bay, Friday, July 21.

Wawa Hotel, Norway Pt., Monday, July 24.

Highland Inn, Algonquin Park, Tuesday, July 25.

The Monteith House, Lake Rosseau, Wednesday, July 26.

Beaumaris, Thursday, July 27.

Elgin House, Friday, July 28.

The Royal Muskoka, Saturday, July 29.

In building up the attendance at these lectures the Association has had the assistance of hotel managements, railways, etc. One hundred and fifty pictures are given during each lecture. The Association bears all expenses, including advertising, printing, etc., thereby leaving to the local authorities the sole responsibility of securing a good audience.

How Europe's Forests Are Paying the Price of War

The Severity aud Mobility of the Conflict Have Taken Fearful Toll of Richest Woodlands

Only when the European War is over and a detailed examination made of the enormous areas of forest surrendered to axe and shell fire will the world know exactly what penalty the timber resources of France and Belgium have paid since August, 1914.

Not only have the Belgian forests and those of the occupied sections of France suffered fearfully by the 'legitimate' necessities of war, but by the deliberate vandalism of the German hosts. As was described in the June "Forestry Journal," the French military authorities have made demands on the Forest Service for materials which cannot be supplied in the time given without injuring seriously the future productivity of the forests. Belgium's richest timber possessions have largely perished either in the first terrible onslaught and stubborn defence, or by the systematic thieving of the German government to supply their home needs without crippling home resources. An article by Mr. J. S. Illick in "Forest Leaves" of Philadelphia, brings one into close touch with the conditions as they existed immediately before the War.

Many and varied are the factors which enter into a consideration of the total amount of damage done. Two groups, however, stand out prominently above all the rest. They are: (1) the prevalence and condition of the forests at the beginning of the war, and (2) the severity and mobility of the conflict. These two groups of factors have very few points in common along the three main battle fronts; viz: the western front in France and Belgium, the eastern front in western Russia, eastern Prussia and Galicia, and the southeastern front in the eastern Alps and the Balkan states. The forest conditions along these three main fronts differ just as widely as the military operations now in progress along them. It is not the object of this article to discuss the military operations now in operation concerning which our daily papers and periodical publications give us ample and fairly authentic information, but rather to describe the condition, prevalence, and economic significance of the forests embraced within the destructive clutches of this gigantic and prolonged struggle. The writer travelled afoot—prior to the outbreak of war—over large areas of rural Europe, particularly the heavily forested portion, and in a few instances traversed the very spots now dissected with tortuous lines of trenches. It is difficult, even for one having been upon the ground, to picture the transformation that is taking place. Today bare, unproductive, and eruptive areas indistinctly mark the sites of former fertile field and finished forests.

The Forests of Belgium.

Forests were common in the western war zone, embracing a part of northern France and almost all of Belgium, when the conflict began, and showed evidence of careful management that must have extended back at least fifty years and in some cases a full century. Belgium alone had 1,290,000 acres of productive forest land valued at $100,000,000. The province of Namur, in which such heavy fighting took place shortly after the beginning of the war had 31 per cent of its total area wooded. The forests of Belgium were among the most productive of Europe before the war, yielding 1.7 cords per acre and year. Since the war began this area has not only been considerably reduced in acreage, but what is more lamentable the remaining forests have lost all the "earmarks" of that careful management which characterized them in the past.

That the people of Belgium will feel the loss of their clean, attractive, productive, and well-organized forests is most certainly true. The small forest acreage in proportion to the population—only two-tenths of an acre per inhabitant—and the industrial conditions, recommended an intensive management of all areas suitable for the growth of trees. The native forests in spite of their high productivity—1.7 cords per acre and year—yielded only a small portion of the total amount of wood consumed by this most densely populated civilized country—660 inhabitants per square mile. About $28,500,000 worth of wood was imported annually, some of it coming from the United States. For many years the demand for wood has been so great that every square foot of ground not required for other more important purposes has been used for the production of this much-needed product. About 84,000 cords were obtained annually from trees bordering roads and canals. These trees, however, did much more than yield wood, for they made the thoroughfares attractive and comfortable, and in some instances produced choice fruit. Few countries could boast of such inviting and distinctive highways, byways and waterways as Belgium before the war. These attractive and useful avenues of communication helped, in a measure, to satisfy and solidify its citizenry, and develop a pardonable patriotic pride in its soldiers.

Private Ownership.

The kind of forest ownership that prevailed in Belgium at the outbreak of the war presents a sad aspect. Private individuals and small communities owned 93.8 per cent of the total area, the state and institutions owning the remaining 6.2 per cent. The loss under such a decentralized form of ownership is certainly felt much more keenly than in countries such as Germany where the several states own 31.9 per cent and private individuals only 46.5 per cent, the remainder belonging to the crown, communities, municipalities, and institutions. When one thinks how slowly forests grow and how difficult it is to reconstruct them, one's pity naturally goes forth not only to the altruistic and beneficient people who were building them up, but also to the oncoming generations for whom they were being developed. A rich heritage for subsequent generations was in the process of development, but the sudden onrush of an enraged neighbor with no respect for property or posterity, and the necessary destructive activities of the defenders of the homeland, soon converted this prospective heritage into acres of desolation.

The forests of northern France differ little from those of Belgium in condition, composition and ownership. The hardwoods—chiefly

oak and beech—comprise from 70 to 80 per cent of the total. Scotch pine, the leading conifer, was limited to the poorer soils which locally comprised rather extensive areas. In the region south of Rheims extensive limestone wastes occurred at the beginning of the last century. About 1807 a movement was started to reforest these wastes. Little was accomplished, however, until about 1830 when reforestation began on a large scale. Just before the war began over 200,000 acres of this waste land had been stocked with trees, mostly Scotch pine. The outstanding feature of this remarkable accomplishment is the commendable fact that most of this vast area was not restored to a condition of superpristine productivity by the state or nation, but by numerous self sacrificing owners of small holdings. Year after year the small woodlot owners upon clearing their land, again prepared it—often by spading or ploughing—for another forest crop, fuly realizing that they would never live to harvest it. The new crops, as a rule, were established by planting small seedlings furnished by local foresters at a very reasonable price, usually the cost of production.

Land Prices Go Up.

That the line of endeavor along which these private owners were progressing was commendable and producing results is shown by the phenomenal rise of land prices. The very areas which sold for $4 per acre before afforestation began were selling for $75 to $125 per acre just prior to the war. The sad part of this narrative is the regrettable fact that these numerous areas of forest land upon which so much private effort and money had been spent were either destroyed or damaged heavily during the battle of the Marne. Areas of forest devastation and destruction do not occur in local spots, but are distributed throughout northern France and all of Belgium. The great size of the contending armies, the severe, frequent and often prolonged battles, and the almost stationary position of the battle line causes one to conclude that the damage is so great that an overestimate would be difficult. One may be able to comprehend in part the existing conditions in northern France from an announcement in the bulletin of the Southern Pine Association of January 17, 1916, which states that "Bids are being asked for 52,000,000 feet of southern yellow pine by the French Government, presumably for the erection of 10,000 houses which it has planned to build in northern France following the war."

Forest conditions along the eastern front in eastern Prussia, western Russia and Galicia stand in contrast with those found along the western front. The forests are larger in size, cover a much greater percentage of the total land area, and are composed almost entirely of evergreen species which comprise from 85 to 90 per cent of the stands, while along the western front not more than 20 per cent were evergreens. The forest structure is also much simpler, in fact, so simple and uniform over vast areas that it becomes monotonous, especially to an American, who is accustomed to find from 50 to 100 species of tree in one locality. Scotch pine and Norway spruce are the only common and important species. The former occurs in extensive pure stands on the sandy plains and in rolling country. It is at its optimum in the Baltic provinces of Prussia and the Riga district of Russia where it attains a large size, possesses straight and clean trunks, has uniform growth rings, and produces much pitch. The Norway spruce increases in abundance as one goes northward or ascends the mountains. Beyond Riga the White Birch becomes a distinctive feature of the forest, however, not on account of its abundance but rather due to its con-

spicuous white bark. Forests in which it is rather common, are often called "white forests" in contradistinction to the "black forests" of evergreens.

On the Eastern Front.

The damage and destruction along the eastern front has extended over an enormous territory due to the great length and the continuously changing position of the battle line. As a rule the degree of destruction has not been so complete nor the extent of damage so great in any one locality as along the western front, but a much greater area has been covered by the almost continuously retreating and advancing armies. The total amount of wood already used, damaged, and destroyed must be enormous. The loss, while large in amount, will, however, probably not be felt so keenly as in Belgium and northern France, where a much larger percentage of the forests were privately owned. Furthermore, a greater percentage of the total land area along the eastern front was still wooded, thus making wood a less expensive commodity on account of the larger supply still available.

The loss is not limited to the immediate vicinity of the forested regions but extends even to foreign lands. Russia was a great wood exporting country before the war. About 60 per cent of the export wood left through Baltic ports. Riga, the objective point of one of the German armies, in the environs of which much fighting has recently taken place, led all other Baltic ports in the exportation of wood. Through this port alone about 18,500,000,000 cubic feet of wood, mostly Scotch pine, left annually for foreign countries, principally Great Britain.

Canadian Research Bureau

The Canadian Pacific Railway and others interested in the establishment of the Canadian Research Bureau, deserve the warmest praise for having brought this about. The Bureau have secured the services of Mr. Arthur D. Little, a well known engineer of Boston, and a former President of the American Chemical Society. Mr. Little is eminently qualified to head such an organization, and we predict that it will be productive of much good.

In brief, the object of the new research bureau is to investigate, organize and systematize our resources. It will carry on a scientific investigation of the mineral, metal, hydro-electrical and chemical resources of the nation and formulate plans for the lessening of the waste in our forests, factories, mines and mills. The results of the Bureau's investigations will be sent out to manufacturers, merchants and others interested in the form of bulletins.

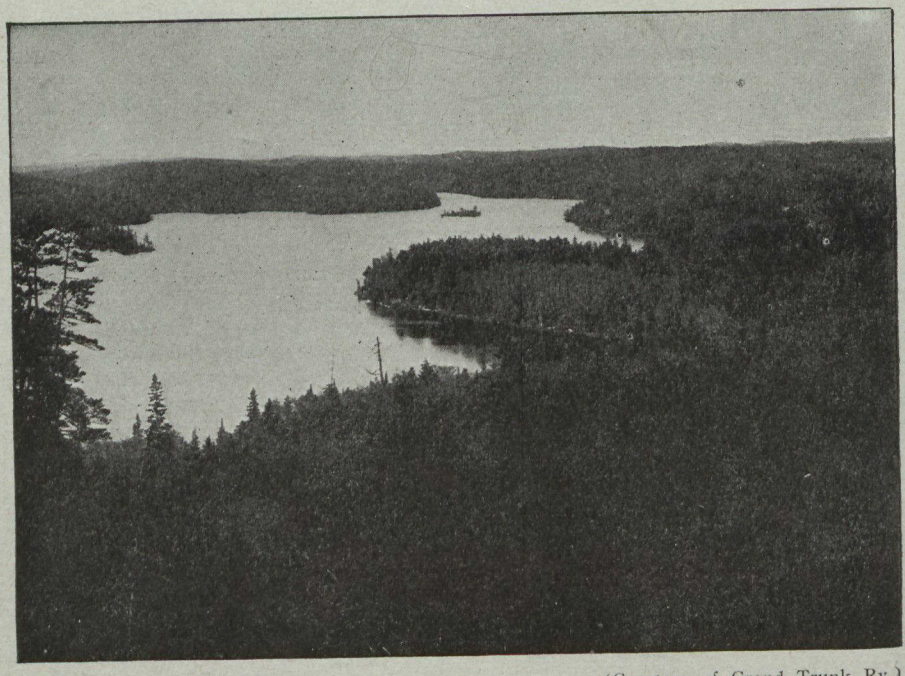
Restoring the Slate

Slates may be brought back into schools in the United States on account of the shortage of paper.

Cheap paper writing tablets now used in schools may disappear, or what is more likely, become prohibitive in price. Common five-cent tablets now contain little more than one-half the sheets they did before the beginning of the war, and paper firms say they are being furnished at an effort.

U. S. Government Paper Bill

More than 30,000,000 pounds of paper, embracing almost every kind in present-day use and costing approximately $1,250,000 a year, is used in the government printing office, making the United States one of the largest buyers of paper in the world.



(Courtesy of Grand Trunk Ry.)

BEAUTIES OF ALGONQUIN PARK.

A splendid view of Cache Lake, Algonquin Park, showing the heavy forest growth, the maintenance of which is the foundation of a large and increasing tourist traffic.

Common Sense Guardianship Is Wanted

Organ of Canadian Manufacturers' Association Makes Emphatic Plea for Immediate Revision of Ontario's Forest Policy

Public sentiment in Canada on the question of forest protection and the need of guarding more than five thousand wood-using industries from the menace of forest fires has reached a point which none of our governments, provincial or federal, can safely ignore. Through the efforts of the Canadian Forestry Association and other bodies, the facts regarding Canada's dependence upon cheap and abundant supplies of wood and the enormous damage wrought annually by preventable fires have been made matters of common information in town and country from coast to coast.

The improvement in public intelligence on such questions has been reflected in governmental action in two provinces, Quebec and British Columbia, in a radical advance of the forest protection services. Very sensibly the British Columbia Gov-

ernment recognized its duty in giving protection to the main sources of provincial income, and has succeeded in introducing a modern and energetic forest service which already has greatly diminished the likelihood of a wholesale timber loss in the future. The Quebec Government looked upon its responsibilities in the perpetuation of the timber and timber industries in a spirit no less advanced. As a result, the Quebec Legislature passed at its last session an amendment rendering it unlawful for a settler to undertake to clear his land by the use of fire, without first obtaining a permit to do so from a qualified ranger. This obviates the ever-present risk of settlers' fires being set out on excessively dry or windy days, and also insures that the heaps of slash shall be kept in the centre of the clearing.

Quebec is also awake in its efforts to make incendiarism in forest areas punishable to the same degree as fires in a town or village. Under Quebec laws several scores of prosecutions of settlers who caused forest fires last year were undertaken, and in many cases fines were imposed or the guilty parties imprisoned.

Ontario, however, has not yet seen fit to apply the obviously necessary reforms in its forest protection service which have been so generally accepted by British Columbia and Quebec, although the latter have less to fear from large fire losses in the forest than has Ontario. It is generally agreed that forest protection in Ontario suffers from lack of organization both at headquarters and in the field. The men are, of course, political appointees, but even political appointees may be carefully and intelligently selected. The supervision and inspection of fire rangers is just as necessary as the supervision and inspection of the employees of a locomotive works. Left to themselves, the serious duties of forest protection are not likely to be carried out. This lack of actual service as rendered by Ontario's fire rangers does not mean that the province is saving money in comparison with other provinces. On the contrary, the lack of supervisors is a costly proceeding; the losses in timber resulting from inefficiency can scarcely be computed. Rangers in British Columbia or in the well-organized sections of the United States have few leisure moments in their daily rounds. The opportunities for education of the local residents by the rangers are extensive. They can build trails and lookout towers, and it is their business to construct safe camp-fire places for hunters and fishermen and campers who make use of the areas within their patrol. They can guard the timber against settler's fires by curbing the carelessness of the settler. That Ontario gets more than a fraction of the reasonable amount of service due from its large number of rangers is doubtful.

Settlers' fires have been proved to be one of the worst source of timber loss. Knowing such facts, the provincial government has taken no steps thus far to overcome the evil. British Columbia and Quebec have prohibited settlers from carrying on burning operations without the advice and supervision of the ranger, and they must secure from him a special permit. This regulation works no hardship on the settler and is a most valuable protection to standing timber. At present, in Ontario, no matter how conscientious the ranger, the settler may snap his fingers at him.

Sir Clifford Sifton has estimated that at the present rate of cutting and burning, the forests of Ontario could not last more than thirty years. This brings the province face to face with a most grave problem. From no other source than

our present standing forests can the two-thousand wood-using industries of Ontario secure their raw materials. Forest fires, indeed, spell gradual extinction for a most important section of the country's industrial life. Having such knowledge, and with no chance of disputing the *responsibility* of the provincial government in the care of the timber, it would seem that this year should see signs of a concession to the demand for a common-sense guardianship.

Fires at the Coast

(Vancouver World, June 15.)

Owing to the absence of rain during the past few weeks the usual danger from forest fires threatens, and reports from outlying districts received by Mr. George D. McKay, provincial timber inspector, show that already numerous fires are under way although the majority of them are under control.

Two fires are reported by Ranger R. V. Stewart one on the limits of the Campbell River Lumber Company at Hornando and another in the cuttings of Land Bros. at Wilson Bay. The former is a small one, and is said to be well under control. The latter is a fire of serious proportions, and for a time threatened the homes of a number of settlers near. The latest report from that place states that it is now fairly well in hand. Fires are also burning in the timber north of Cape Lazo and east of Courtenay, on Vancouver Island. Another small fire has started near Coquitlam, in the Dominion railway belt, and several others east of Langley. No harm has been done by them as yet.

"The lateness of the spring, the scarcity of green foliage and the warm weather of the past few days, are the causes to which these outbreaks can be attributed," said Mr. McKay. "Had there been the usual heavy growth of green foliage the fires would not have had the chance to spread. We are well organized, however. Our rangers and guards are all on the lookout for fires, and in addition, this year the loggers seem to be better equipped than they have been to fight the fires. All of the camps have a good supply of pails, buckets, hose and other equipment for fighting the flames, and the danger seems to have impressed itself upon every man employed around the camps. Our guards and rangers are taking all precautions to prevent any large fire from breaking out, and I think that the outlook is considerably better than it has been for several seasons."

Quebec Settlers Obey New Permit Laws

That settlers in forested districts will accept sensible legislation in the spirit in which it was designed has been proved by results in Quebec thus far in 1916. The amendment passed at the last legislature requires a settler to obtain from a ranger a permit to start his clearing fires, such a stipulation blanketing the entire season of fire danger. The Lower Ottawa Forest Protective Association report that to the first of June, 1916, about 350 settlers' slashes have been burned in their territory under permits.

The rangers and inspectors report further that "we are receiving hearty co-operation from the settlers, no prosecutions of offenders having been rendered necessary as yet. The new laws are of much benefit and we encounter little trouble in having them painstakingly applied."

Turning Slash into Dollars

Utilizing Refuse of Logging Operations for Fuel, Ashes and Pulp would Bring Riddance of Fire Problem

By Thomas B. Wyman,
Secretary-Forester of the Northern Forest Protective Association,
Munising, Michigan

The title of this paper requires the consideration of two conceptions: the one that of the general term "Slash,"; and the second, the idea that there is a problem connected with the presence of slash from forest operations.

Slash—in the broadest sense of the word, means the refuse from the harvesting of timber, and includes tops, branches, hollow butts, and all such material as is commonly left after taking out the so-called Merchantable Timber.

Slash may be created by clear cutting operations, in which all merchantable timber is removed, or through the selection system of operating, by which only certain species or certain sizes are utilized. In the first case, nothing is left upon the timbered area except Slash, unless perchance, the natural deposit of seed from standing timber has resulted in the establishment of a seedling growth. Usually, however, such a growth is entirely unnoticed by the lumbermen, and entirely ignored as to value, either present or future. In the second case, a certain amount of Merchantable Timber stands among the Slash ready for the harvest, and whether or not this standing timber will ever be utilized for commercial purposes depends entirely upon the proper solving of this slas hproblem.

The problem of slash is in reality a problem of fire control within the slash; or of preventing the burning of operated areas and the consuming of the refuse material. As yet, we have made no actual strides toward the elimination of the menace of slash and it is this menace, more than any other, against which we must guard to prevent destruction to standing and harvested timber by fire.

Slash, the Great Menace.

The state of Michigan has been the scene of logging operations for many years, and during this time, thousands upon thousands of acres of slash have been created—and burned. With the burning, destruction has spread to standing timber, either killing it outright or damaging it to such an extent that unless immediate operation could be instituted, a large financial loss must necessarily accrue.

The area of slash through which fire has not spread is hard to find.

Michigan embraced within its area thousands of acres of standing Pine—White, Norway and Jack—either in pure groups or in mixture with each other. The day of the original Pine in Michigan has passed, and we have left, to jog our memories, thousands of acres of these so-called Pine Plains. These Pine Plains are simply areas of pine slash destroyed by fire and consistently reburned, until all soil cover has been consumed and the vegetable content of the upper soil largely depleted. With the burning of the pine plains occurred the destruction of seed trees, unthinkingly left and

of the natural regeneration by which nature sought to reclaim these vast areas.

Having succeeded in eliminating the pine forests of Michigan as a commercial asset, inroads are now being actively made upon our Hardwoods and other timbers, and although the condition may not be so acute when uor hardwood lands are cut over—because of greater agricultural possibilities upon them, we will still have our non-producing fire burned pine plains as an evidence of the improper solution of the slash problem.

Authorities differ as to the proper solving of the problem of disposal of refuse from logging operations, but the common assumption is that to secure safety, slash should be burned. In fact, we have in some states, compulsory slash burning, thus compelling operators to invite further ravages by the demon—FIRE.

I do not believe in the use of fire under any circumstances, nor do I believe it necessary to expend a considerable amount of money in this work, thus adding to the cost of production by way of windrowing, brush piling or top-logging; but on the other hand, until means are devised by which slash can be UTILIZED, forest management, which should include patrol, fire lines, lookout towers, and educational features should prevail.

This question at once presents itself: Can slash be utilized? And I say in answer that there are many products which can be derived from the saving and utilizing of the forest slash, and if the returns from such utilization meet the cost of the necessary saving operation, the gain —that of the elimination of the forest fire danger—is both real and material.

Fuel, Ashes, Pulp.

And now, having concluded that the utilization of the slash, or the refuse from logging operations is a feasible, and the reasonable procedure, let us consider what products and by what means such material can be harvested. Of the many products which can be made from forest refuse, the three which appear to offer the greatest possibilities, are: first, FUEL WOOD; second, ASHES; and third, PULP.

Abroad, the utilization of FAGOTS or fine wood as fuel, is in general use. Why not begin the saving of our best body timber for commercial use, and encourage the utilization of our present waste by turning it to fuel purposes?

This can be accomplished by educational means, covering both the necessity of the saving of the better grades of wood and the possibility of using for fuel those grades of less commercial value. The actual method of reclamation may be nothing more than the axe, the saw and means of transportation. Equipment could, of course, be developed as the exigencies of the case necessitated.

In years to come we will look back upon this wasted asset with wonder at our lack of foresight.

The production of ashes for fertilizer, potash, lyes and other biproducts is also easily accomplished, and entails only the destructive burning of the slash in closed furnaces or retorts, so that NO DAMAGE results to the soil and NO RISK to surrounding property.

How much are Unleached Hardwood Ashes worth? Just ask your dealer, and the figure will surprise you. "But" you say, "ashes are a fertilizer in themselves, and when the slash is burned, it returns this ash to soil." This statement is but partially true; and even if wholly true, neither solves our problem nor is it often of value.

Modern science is constantly at work in the paper making industry as in other lines, and great advancement has been noted. We recognize as paper making material—straw,

rags and fibres of many kinds, most prominent of which is wood fibre; but to date, the wood fibre used is largely of the body variety rather than the refuse product—for high-grade papers rule. However, developing toward the saving of such waste has been going on, and we are now able to use this product by a process of shredding, digesting and beating in the production of low grade papers, and of heavy paper-box-board material, etc.

The utilization of the slash for this purpose requires, naturally, more equipment and more investment, but again, it is feasible, because it turns to use a product now considered as waste, and by the use of which, the better grades of fibre can be saved for higher grade papers and purposes.

All details necessary for use of slash material in paper making are at hand and can be supplied on request; and the use of slash for the ash and other bi-products is even now being practiced, while the use of fine branch-wood for fuel is a development which must necesarily follow the depletion of our forest areas.

When fire finds no place in woods operations of any kind, except it be fully confined, then, and only then, will the danger of forest fires be eliminated.

"The forests form one of the largest of the natural resources of Canada and one that has contributed largely not only to the general prosperity of the country but to the public revenues. Moreover there are extensive areas that will be productive only if they are used for growing forests. With these facts in mind it seems self-evident that it is the duty of every citizen to take an interest in the forests. The support of the Canadian Forestry Association is one of the channels through which every citizen can have a share.

"The Association has done splendid work in placing before the public the value of the forests and the means for protecting them and making them more valuable. The improvements in forest management in recent years are largely due to the work of the Association. It is in every possible way educating people to the necessity of preventing the fires which take such heavy toll from the forest every year, and is securing that co-operation in protection which must finally embrace every citizen of the commonwealth if it is to be successful.

"The Association's work will be successful in proportion to the strength and numbers of its membership and it deserves the support of every citizen who is interested in the prosperity of the country. The provincial governments derive large revenues from the forests and even if the object were only to keep up the public revenues and restrict the scope of direct taxation it would be deserving of the support of the tax-paying public."

June, 1916.

R. H. CAMPBELL,
Director of Forestry.

How to Build a Camp Fire

The Camp Stove Best when Transportable—Stove Constructon for Permanent Camps—The Use of Fire Irons

With the camping season due there come the usual questions on how to build camp fires. There are several varieties, most of them simple and effective and easily constructed even by a novice in camping. There must be considered not only the kind of camp fire which gives the best service but the kind which is least dangerous. The man who is careless with his camp fire should not be allowed in the woods for all too frequently he is responsible for forest fires which do tremendous damage. The Forest Service has issued a hand book for campers in which the following excellent instruction regarding camp fires is given.

Camp stoves should be taken whenever they can be transported. They are safer than open fires, more convenient, require less fuel, and do not blacken the cooking utensils. Collapsible sheet-iron stoves may be obtained.

In the absence of a stove an open fire must be built. A safe and serviceable fireplace can be made of rocks placed in a small circle so as to support the utensils. Where rocks are not obtainable, poles may be used.

For permanent camps it pays to build a stone fireplace. One is shown in the illustration. A piece of sheet iron will prevent the blackening of the pans and makes a better draft.

For temporary camps the fire should be built as follows:

Dig a hole about a foot deep and about three or four feet in diameter. Shovel away the side toward the wind. Lay green poles across the hole to support the pots and pans, and build the fire underneath.

Fire irons are often a great convenience. A piece of three-eighths-inch round iron four feet long is bent at right angles a foot from each end and the ends are sharpened. Two of these irons are placed side by side, the ends are driven into the ground and the fire kindled beneath them. Instead of being made in one piece, the pegs and cross-bars may be connected by rings in the ends. They will then fold and be easier to pack.

Camp fires should never be larger than necessary, and the utmost care should be taken to prevent sparks from being carried into the neighboring forest. Clear away the litter for a considerable space about the fire. And be sure to **put the fire out** before you leave it.

A shovel is nearly as important a tool as an ax in camping. Do not count on finding one along the way, but put one in your outfit.

During wet weather look for kindling in burned sugar pine or yellow-pine butts or in pine knots. The under side of a leaning tree will usually contain dry material. Dead branches—of manzanita, etc.—that have not yet fallen are drier than those on the ground. Bark from fir snags is excellent fuel.

Where matches are scarce or when the weather is stormy, first light a candle and kindle your fire from that.

Hints on fire protection are always timely and fit particularly well with these instructions about camp fires.

The first thing is prevention. Bear in mind the Six Rules. Be particularly careful with camp fire, matches, and tobacco, since carelessness with these is punishable by law.

Scrape all inflammable material from around the fire before lighting it. Make a fireplace either by digging a hole or by piling up rocks. The fire will then not only be safer but will draw better.

Before leaving camp see that the last spark is extinguished. Pour water on the embers and then cover them with earth.

Don't make your fire too large. Large fires are not as convenient to cook by as small ones and are more trouble to put out.

If you discover a fire, go to it at once and put it out if you can. A small fire can be put out easily by throwing handfuls of earth, sand, or dust at the base of the flame. The flames may also be beaten down with sacks or with branches, but care must be taken not to scatter the fire.

If the fire is spreading too rapidly to be attacked directly, cut and scrape a trail some distance ahead of it. Do not back-fire; this is work for an experienced man. If a fire is serious enough to require this treatment, the work should be left to a ranger.

The best tools for fire fighting are the shovel, ax, and hoe or rake. In open pine forest very little ax work will be required. Shovel or rake a trail through the needles down to mineral soil, and guard the trail.

To stop a fire burning in brush the trail must first be cut with the ax and then scraped. The brush should be thrown to the side away from the fire. The litter may be scraped toward the fire.

Pick a route for the fire trail that will avoid brush patches if possible. The crest of a ridge is an excellent location, since the fire naturally checks at the top.

Do not give up because the fire is gaining headway or because you lack tools. The fire has already been reported by lookouts, and rangers are hurrying to it properly equipped. Stay and help them; and in the meantime do what you can to keep it in check.

See that a fire is cold before you leave it.

Report all fires to the nearest forest officer.

Do not suppose that because a fire is merely burning in apparently worthless brush it is therefore doing no damage. Such fires are often the most serious.—"American Forestry."

Women in Wood Factories

As an indication of the shortage of men in various industries throughout Great Britain, it is interesting to note the following dispatch in the Timber Trades Journal of London:

"As compensation in some measure for the loss of the large numbers of men who have joined the colors, or who are about to be called up, women are now being recruited for the workshops, and everything possible is being done to utilize female labor until the end of the war. In our sawmill section this week we print a pamphlet issued by the Home Office and the Board of Trade giving particulars of the branches of the woodworking industry in which women may be substituted for men. There is always a certain amount of danger in a sawmill, as in many other industries, but in light employments such as those suggested, women will be able to tide over the shortage of labor until the war is over. For many years past women have been employed in box factories in London in the manipulation of light boxes, and it is surprising how adept at the work they become in a short time."

Ravages of Insects in Canadian Forests

In Valuable Limits, the Cost of Piling and Burning Slash is Offset by Saving from Insect Injuries

By J. M. Swaine.

In Charge of Forest Insect Investigations, Entomological Branch, Ottawa.

(Article Concluded from June Issue.)

The most serious insect-enemies of our forests are various species of bark-beetles. The adult beetles, usually less than one-quarter of an inch long, and brown or black in color, cut cylindric tunnels between the bark and wood of nearly all our timber trees. The eggs are laid along the sides of the egg-tunnels, and the grubs bore away from the egg-tunnels usually between the bark and the wood, and coring both. When green trees are attacked the liquid resin forms about the entrance hole to form a gum tube on the bark; and the trunk being girdled in hundreds of places by the egg-tunnels and larval mines, the death of the tree usually results within one year.

Many species of Bark-beetles attack badly weakened or dying trees or those recently killed; others occasionally attack and kill healthy trees, and commonly assist in the attack by more destructive species; these last, a limited number of species, belonging mostly to the genus *Dendroctonus,* are recognized primary enemies, readily attacking and killing the finest trees, and at times occurring in great outbreaks quite as destructive as a forest fire. I shall mention a few of these primary enemies.

Enemy of White Pine.

The Western White Pine or Mountain Pine, *Pinus monticola* is being kileld out, whenever it occurs in British Columbia, by the Mountain Pine Bark-bettle, *Dendroctonus monticolae.* Whenever we have found the Mountain Pine, from Vancouver Island as far east as Glacier Park, this beetle has been busy at its destructive work. There are very few valuable stands of white pine left in British Columbia and the chief agent in its destruction has been its inveterate enemy, the Mountain Pine Beetle. Unless control measures are undertaken very soon there will be no White Pine of timber size in that province.

The Western Yellow Pine or Bull Pine, *Pinus ponderosa* occurs in large forests over an irregular area in Southern British Columbia. For several years past a great outbreak of bark-beetles has been spreading throughout the Similkameen country. The present outbreak started apparently about eight or nine years ago about Okanagan lake, and has spread from the western slopes of the Gold Range as far west as Princeton and Nicola. A few days ago we received a report of the death of a large area of timber near Nicola Lake, and the valleys to the west of Merrit are threatened. In the districts longest affected, or where the beetles have spread most actively, all the pines, both yellow pine and black pine, are dead, and the country appears as though swept

by a great forest fire, except that only the pine has been killed; the Douglas Fir, spruce, and any trees in the stand other than pines are not affected. Over the greater part of the infested area the injury is evidenced by clumps and strips of dead trees with scattered dead trees here and there. In some sections the injury is extending very rapidly, while in others the spread is more gradual.

Growingly Serious.

Three species of beetles belonging to the genus *Dendroctonus* are responsible for this destruction. The most abundant is *Dendroctonus monticolae*, the Mountain Pine Beetle, already referred to, second in importance is *D. brevicomis*, the Western Pine Bark Beetle, and the third, *D. valens*, the Red Turpentine Bark Beetle, assists the other two destructive species. Minor attacks by these beetles also occur in the Kootenays. I have said enough to indicate that the loss from these attacks has been very great, and the injury is spreading and becoming more serious each year. There is the further danger connected with such bark-beetle outbreaks that fires may be started in the extensive areas of dead beetle-kileld timber, and thus obtain great headway. The control of these bark-beetles, not yet undertaken, would appear to be a most necessary measure for the southern interior of British Columbia.

The Black Pine or Lodgepole Pine, improperly termed Jack Pine, *Pinus murrayana*, is being killed extensively by the Mountain Pine Bark Beetle. It occurs in mixed stands with Yellow Pine and with White Pine and is killed apparently quite as readily as its more valuable neighbours. Black Pine is attacked by an allied species, *D. murrayanae* in the Rockies, but no definite outbreaks by that species have been located.

Jack Pine, *Pinus divaricata*, is attacked in Northern Manitoba by *Dendroctonus rufipennis*, but no important outbreaks have been found.

The Eastern White Pine, *Pinus strobus*, is injured at the base by *Dendroctonus valens* as is also our Eastern White Spruce; but we have at present no extensive bark-beetle outbreaks to Eastern White Pine in Canadian forests.

The Sitka Spruce, *Picea sitchensis*, is attacked and killed by its common enemy, the Sitka Spruce Bark Beetle, *Dendroctonus obesus*. This beetle is killing small numbers of mature trees at various places on the Coast and on Vancouver Island; it is apparently more injurious in the Queen Charlotte Islands, although the dying timber there has not yet been examined. The Sitka Spruce Bark Beetle is an enemy well worth careful attention in spruce limits throughout its range.

Into Green Timber.

The Engelmann's Spruce, *Picea engelmanni*, in British Columbia, and Alberta, and the White Spruce, *Picea canadensis*, in northern British Columbia, northern Alberta and the Yukon, are readily attacked and killed by *Dendroctonus borealis*. This injurious species is everywhere abundant in slash and dying trees, from whatever cause, and has spread in recent years from the slash of clearings and trail cuttings to nearby green timber. Several such outbreaks in their initial stages, were located this summer in Northern Alberta and in Eastern British Columbia, and a similar outbreak has just been reported from Southwestern Alberta. The injury is showing in Glacier Park and in Field Park in several places. The early application of control measures will prevent more extensive injuries.

The White Spruce, *Picea canadensis*, is attacked in the Eastern Provinces by the destructive Eastern Spruce Bark Beetle, *Dendroctonus piceaperda*. During the last century there were several great outbreaks by this species in South-

eastern Canada, New York and New England, comparable to the bark beetle outbreaks by *monticolae* and *brevcomis* now raging in British Columbia and the Western States. In the several outbreaks billions of feet of the finest Eastern Spruce were killed and later largely destroyed by fires. There have been reports recently of small areas of dying Spruce in the Quebec forests, and these will be investigated this summer. Any evidence of the activity of this most destructive enemy should receive immediate attention.

Slash Burning a Help.

The Douglas Fir and Western Larch are attacked and killed by the Douglas Fir Bark Beetle, *Dendroctonus pseudotsugae,* everywhere throughout its range in British Columbia. Isolated dying trees and small clumps of red-tops indicate the injury in many places. There are at present extensive outbreaks by this beetle in our forests, but the aggregate loss from its attack on isolated trees is great. Probably all these losses would be avoided in operated limits by systematic slash-burning.

The Eastern Larch is attacked and killed under certain conditions by the Eastern Larch Bark Beetle, *Dendroctonus simplex*. Usually this beetle confines itself to slash or to completing the work of the larch sawfly by killing the trees weakened by defoliation.

In addition to these more destructive species, other species of bark beetles are each year responsible for the death of considerable quantities of Western Hemlock, Lowland or Grand Fir, (*Abies grandis*) in British Columbia, Alpine Fir (*Abies lasiocarpa*) in Eastern British Columbia and Western and Northern Alberta; and Balsam Fir (*Abies balsamea*) in Ontario, Quebec, and the Maritime Provinces. The aggregate of these minor injuries is very great, and in the case of the Eastern Balsam is particularly to be regretted since this tree is now being utilized for pulp wood. A large part of this loss could be averted on limits where lumbering operations are being carried on .

Control of Bark Beetles.

Although the bark beetles are so destructive they can be controlled effectively by destroying the broods of beetles in the area infested. Each of our destructive bark beetle species has certain characteristic habits, but in a general way the following statement applies to all. The adult beetles emerge in early summer from the trees attacked early the previous season and enter the bark of fresh slash or green timber in pairs through a round tunnel cut directly through the bark to the wood surface. When green trees are attacked a mass of gum-tubes, forms about the entrance hole and serves to distinguish the fresh "beetle trees" before the foliage changes colour. The female continues the entrance tunnel between the bark and wood as a vertical or winding egg-tunnel, along the sides of which she deposits her eggs at intervals, or in layers. The larvae bore away from the egg-tunnels in the inner bark or between the bark and wood, pupate in the ends of their "larval mines," and finally emerge from the bark early the following summer through round "exit-holes" cut through the bark. The winter is passed in the larval or in the adult stage in the bark of standing trees, logs or slash infested the summer immediately preceding. Dead trees are never re-infested. The general principle to be followed in their control is, therefore, to destroy the broods during winter in approximately 75 per cent of the infested bark, selecting the most heavily infested trees sot that approximately 75 per cent of the broods of beetles wil be destroyed.

If the infested limit is being logged, the beetle-infected logs are treated so as to kill the broods in

the bark by one of the following methods:

1. Put the logs in water in the early spring and leave them immersed long enough to kil the brods.
2. Saw the infested logs during winter and burn the slabs before spring.
3. If the infested trees cannot be logged with profit, but control of a beetle outbreak is necessary, the infested trees may be felled and the bark removed from the main trunk and burned if necessary, or the bark may be removed by barking tools from as much of the lower trunk as can be reached making particular effort to so treat the large and heavily infested trees.

The Case of Red-tops.

The old red-tops, killed the preceding or in previous years are never reinfested by the injurious species and are of no importance in the bark-beetle control; beetle killed trees and fire killed trees should be utilized the first winter following their death if the trees can be logged profitably, otherwise the timber will be greatly reduced in value or destroyed by boring grubs.

The slash from cutting should be burned between October and May. This alone will do much to check the increase of injurious insects in the limits. Many more or less injurious species as well as the more destructive species are found in the bark of tops, culls and slumps in immense numbers. If the slash from the winter's cut is piled and left to be burned during the following winter season, it will serve as a trap and **on a valuable limit the saving in loss from insect injuries should alone repay the cost of piling and burning.**

Injuries to Stored Products.

Camps made of unbarked logs are frequently infested by boring grubs. Building lumber on which part of the sapwood and bark have been left is sometimes found to be infested with boring grubs long after the building has been erected; in such dry wood the life time of the grubs is extended often to an extraordinary degree. Logs that are to be used in the unbarked condition for building purposes should be cut in the fall and piled loosely off the ground so that the inner bark may become well dried before the following June. Green lumber, bearing sap-wood and bark, should be avoided for building purposes.

Woods used for interior finish and for implements such as spokes of wheels and axe handles, are sometimes badly injured by powder post beetles. Such injuries have been apparently rare in Canada in recent years.

First Aid Instruction to Camps

Dr. M. J. Shields, of Washington, D. C., field agent of the first division of the American Red Cross, has begun his campaign of safety first and first aid in the mills and logging camps of Oregon. This work will be along the lines carried on in the State of Washington during the past year where 100 camps have been visited and 8,000 lumber workers instructed in first aid.

This work in Washington has not only been the means of preventing a great number of accidents, but it has forestalled innumerable cases of infection and blood poisoning. Lives and limbs have been saved by men instructed in first aid work being on the spot when the accident happened with a knowledge and material for rendering efficient and prompt first aid.

IN BRITISH COLUMBIA'S FORESTS.

Felling a Giant, Twelve Feet in Diameter.

In the Forests of Queensland

There are three distinct and important lines along which the Queensland Government is moving in connection with the question of preserving the reserves of timber. The first is the reservation of timber lands. The second is the planting of young trees on those lands and the appointment of competent men as managers of the reservations. The third is the co-operation of the government, with the other states, in the establishment of a school for the education of special officers for the forestry branch.

At the present time the total area of land permanently or temporarily reserved for forestry purposes approximates 4,000,000 acres. A large number of small holdings are included in this total, as in earlier years, a great many large timber reserves were alienated, only small areas being withheld. The present government has adopted a sound policy to guard against the depletion of timber resources. Before any land is opened for selection, the Forestry Department, of which Mr. N. W. Jolly is director, is asked to obtain a report from its officers. This report will contain an estimate of the probable quantity of timber, and if the forest is considered good enough for immediate use, or to possess sufficient young timber, it is permanently reserved. The rent received last year was £74,700—nearly double the amount received six years previously, and five times the amount collected in 1906. The total expenditure on forestry last year was £7,650, but a considerable portion of the work is done by land agents and Crown land rangers, whose salaries are not charged to the forestry branch. The minister and the director, therefore, consider that if money could be made available it would be highly desirable that forest stations should be established in a number of districts. At present there are only three small forest stations in existence in Queensland—one at Atherton, one at Frazer Island, and one in course of establishment at the Brooloo State Forest. These, however, are very small establishments, which only form the foundation for future work. The minister's aim is to have a series of forest stations, where officers of the department will reside and manage the public estates.

One of the great difficulties in the way of the department, and one which emphasises the need for the establishment of forest stations, is the existing growth in forests of trees, weeds, or timber which is unsuitable. This hampers the department in the economic treatment of forests.

For several months past the various state governments of Australia have had under consideration the question of establishing schools of forestry. A conference was recently held by the directors of forestry in the different states, with a view to arriving at some scheme by which one school, at least, could be established in some central state. As a result of these negotiations, an executive minute was passed last week by the Queensland Government undertaking to co-operate with the government of New South Wales in the establishment of a school of forestry at Gosford (New South Wales). The government has agreed to pay for each student sent by Queensland a sum equal to the average cost per student. Queensland is to have the right to nominate a representative on any board appointed for the management of the establishment and the formulation of a curriculum.

War's Effects on the Forests of Switzerland

Mobilization Took Away Three-Quarters of the Swiss Foresters—A Soaring Market for Wood Products

(Translated From "Revue des Eau et Forests.")

War broke out exactly at a period of intense activity for the mountain foresters busy with the works of defense against avalanches, with the working out of plans of management and road projects, works which are carried out during the long days of the summer when the snow is gone and it is possible to travel easily in high mountains.

The foresters of the valleys were having some weeks of less intensive work after the operations of the spring and the commencement of the autumn work, and had gone to the National Exposition, of which the forestry section was the rendezvous for all the woodsmen.

The mobilization of our three classes of the army (Elite, Landwehr and Landsturm) took away from their duties three-quarters of the Swiss foresters, occupying in the army the most varied posts from the simple soldier or non-commissioned officer to the commander of a regiment. Those who remained at their civil posts had an arduous task, although in the month of October the depression in business was general and had its effect on the wood market. The mobilization coincided with the automatic stoppage of construction, especially in the cities where the nancial and economic crisis was and is intense. "When construction is not going on nothing is going on," they say in Switzerland. We have realized it in a serious way since the 1st August, 1914.

Big Cut of Fuel Wood.

At the end of September the public authorities feared that the supply of coal and oil would be short, for these combustible minerals come to us especially from Germany and Belgium. They, therefore, asked the foresters to cut great quantities of fuel wood, which was not very easy on account of the mobilization of the greater part of the fit men and by the departure of nearly all of the staffs of the Italian wood merchants who are our useful auxiliary foresters. As a matter of fact more fuel wood was cut than was necessary, for the coal arrived and still arrives more or less regularly, and the price has scarcely increased more than 10 per cent. In fact the market for fuel wood has scarcely increased, compared with that of 1913.

Few Government or communal forests delivered the usual quantity of timber, for it was known that there was no construction going on, and the foreigner was not at that time making demands upon our sawn wood.

However, at the beginning of the year 1915 an awakening took place in the timber market. This was caused by Italy, who, not being able to obtain from Austria the materials which she obtained from there in ordinary times, asked Switzerland for the stock of planks and timber that she could deliver.

Export to France.

After the disaster of Avezzano the Italians had recourse to Swiss production, and a large quantity of construction timber came through the Gothard and especially the Simplon. At that time, too, requests for treated posts came from France. It may be said that from the beginning of May the exportation of Swiss timber into France was organized on a large scale and that is gradually became greater, the price of certain kinds of sawn wood having increased from 50 to 80 per cent., compared wtih the condition of sales ten months before.

The Federal Government has restrained to a certain extent this trade, and in order to obtain equivalents in other materials the exportation of building timber is now governed by special formalities, and latterly the exportation of walnut, ash and other species, which our country cannot do without, has been prohibited.

The war has produced a complete upheaval in our timber market, for Switzerland was previously dependent on foreign countries and incapable of producing the building material which it used, and behold her now providing it fo rher neighbors on the west and on the south. On the other hand, Germany and Austria have almost completely stopped their exportation of wood materials into Switzerland, so that what is sent to France and to Italy is entirely of Swiss production; our statistics prove it, and we make a point of stating this to our French customers.

High Prices Offered.

At the moment of writing these lines the demand for planks, boards and other kinds of sawn material is so strong that even the smallest sawyers, especially of Romanic and Central Switzerland, receive visits from French merchants or their Swiss agents, who collect at any cost boards, paneul-wood, etc., often without insisting on a choice of which particular material they will receive. One readily pays at the present time for boards from 2 francs to 2 francs 30 per square metre, F. O. B., and lots of spruce logs in the forest are sold at public auction or by written tender from 20 to 30 francs per cubic metre, according to the distance from the nearest railway station.

If we look now at the market for wood of small dimensions that cannot be used as logs or posts we have a very interesting statement to make, and that is in direct connection with the production of paper. Before the war the pulp and cellulose mills obtained from foreign countries a large proportion of the raw material, and naturally a deficiency resulted a short time after the declaration of war. Then the manufacturers were obliged to tempt the owners of the forests by the most advantageous prices. In that particular part of the timber market the increase in price is from 20 to 30 per cent. The fact should not be overlooked that our manufacturers obtained six months ago public authority to prevent the export of fire wood, for the tenders from France seemed about to paralize that branch of our industry, and the manufacture of paper in Switzerland would probably have been ruined.

We other wood producers greet this development with legitimate satisfaction, for now our manufacturers of cellulose and wood pulp have discovered that they can obtain the materials they require in Switzerland on condition that they

offer prices slightly higher than those obtained for cubic metres of fuel. May this special production become more and more popular in operations where thinnings are made regularly on a large scale.

Oak Bark Soars.

Before the war operations in oak bark had fallen into disfavor, as our peasant woodsmen were receiving only from 8 to 9 francs per hundred kilograms f. o. b. In May, 1914, the price had reached from 18 to 20 francs, for importation from France and Austria-Hungary was suspended at the beginning of hostilities. We expect to see these prices rise still higher next season, but we have no illusions but that as soon as peace is signed, our life resumed and the open frontiers will allow commercial exchange, that our tanners will return to their old love and will turn to those who will give them tanning material at from 8 to 9 francs f. o. b. at a Swiss railway station. It is coppices of the Haute-Saone and neighboring regions that will profit by this, and all that remains to be done is for the Swiss foresters to continue the steady conversions into high mixed forest of our last traces of coppices, for do not let us forget that Switzerland should work to increase its forest area, which will make us less and less dependent on the output of foreign nations.

Prudence Points the Way

L. C. Boyle of Kansas City, filed with the Federal Trade Commission the first volume of his brief in the first important general investigation by this commission which contains in its analysis of the situation the following:

"European nations early recognized the need of adopting methods to avoid forest waste. With us, on the contrary, our splendid forest wealth has been needlessly squandered. Through error and lack of grasp, a greater proportion of our developing need passed from public to private ownership. This fault can not be answered or cured by placing the blame at the door of speculative greed. While we were evolving our political and industrial destiny, the majestic forest wealth of the nation remained unprotected and uncared for. This great national asset seemed limitless. The time has come when the dictates of prudence and a better understanding of national need impel a survey to be made of our remaining tree supply, to the end that a more rational national policy be worked out. Although we speak for the industry, it is our hope that the commission will feel and believe that our effort is in accordance with public interest.

Course in Logging Engineering

Arrangements for the course in forest or logging engineering at the University of California are completed and instruction will commence at the opening of the next college year in August. The course will require four years for completion, but all phases of the work will be taught from the start, so that any students who desire to shift from other lines of work may do so without delay.

The object of the course is to train men along lines somewhat parallel to civil, mechanical and electrical engineering, but specialized toward work in the lumber industry.—The Lumberman.

Classifying Lands in New Brunswick

Three field parties are now at work in New Brunswick, in connection with the forest survey and classifiication of Crown lands. The project is under the supervision of P. Z. Caverhill, provincial forester, subject to the general direction of the Minister of Lands and Forests. The size and importance of the undertaking is indicated by the fact that the Crown lands in this province comprise 10,000 square miles and return a direct revenue to the provincial treasury averaging more than half a million dollars annually from timber alone, in addition to large revenues from the sale of hunting and fishing privileges.

The best agricultural lands are naturally along the valleys, and it is here that settlement has, for the most part, been concentrated. In some cases, however, settlement has extended to the uplands. Some of these lands are well suited for agriculture, but in other cases the settlers have apparently been attracted primarily by the timber or by the desire merely to locate a home and have settled on lands not fit for permanent agricultural use.

There is considerable pressure upon the provincial government for the opening up of new lands, to provide for immigration and for the surplus native population. An important feature of the Act of 1913 was the provision for a classification of soils, with the object of directing settlement to lands really suitable for farming purposes. This wise provision is now being carried out, and the result will no doubt be to reduce to a minimum the location of settlers upon non-agricultural lands. The evil effects of such settlement may be seen in every province of Canada, and are due to the previous absence of a definite policy for the directing of settlements to lands realy fit for that purpose.

The province of New Brunswick has undertaken to avoid the recurrence of such tragedies as were discovered by the Commission of Conservation to have been enacted in certain portions of the Trent watershed, Ontario, where settlers were allowed to locate on poor, sandy soils, then chiefly valuable only for their timber. With the removal of the timber and the exodus of the lumbering industry, these settlers have been left stranded, with no opportunity to make a comfortable living, and faced with the necessity of constantly lowering their standards.

The work of land classification in New Brunswick is being carried on in connection with the timber estimate and mapping of Crown lands. The country is covered systematically and examinations of the soil are made at regular intervals. Beyond any doubt, the result will be the opening up of new lands for settlement and the establishment of new communities under conditions which will ensure comfort and a reasonable standard of living. This in turn will mean a permanent increase in the population of the province, by providing for the native surplus as well as for immigrants from the outside.

The Commission of Conservation has co-operated with the provincial government in laying the foundation for the land classification work, through the detail of several experts, who have just returned from an extended trip to the several localities in which the field parties are now operating.—C. L. in "Conservation."

A HELPING HAND

While the losses of members in many Canadian societies have been heavy during 1915 and 1916, the Canadian Forestry Association is moving steadily forward.

GIVE THE ASSOCIATION A HELPING HAND TO PASS THE 4,000 MARK BEFORE MIDSUMMER.

This will be difficult unless several hundred members clip out the attached coupon NOW and fill in a name of a friend.

You need send no money until September next and then only a dollar bill. There is no strict prohibition of course against enclosing the dollar with the application.

Just suit yourself.

The new member will receive twelve issues of the Canadian Forestry Journal, and eight or ten small illustrated books dealing with forest protection.

Here is the coupon. Start at it now.

Secretary, Canadian Forestry Association,
Booth Building, Ottawa.

Make the following a member of the Canadian Forestry Association. In September, 1916, the annual fee of

a dollar will be paid by {him / me}.

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The Experience of New Zealand

Sir J. G. Wilson, head of the New Zealand Agricultural Board, in dealing with the Dominion's timber supplies says: "It is common knowledge that the available amount of timber left in New Zealand will last perhaps 30 years, and at the most 40 years. Unless immediate steps are taken to plant considerable areas, future generations will have to import all the timber used. The government is doing something towards planting trees in a few districts in New Zealand. The whole of the present government areas might give six months cutting. When he came to the Ragitikei-Manawatu district in 1873 there was a fringe of open country which had been settled all along the coast up to and some distance beyond Wanganui. In the Wairarapa also the open country from Featherston to Masterton and out to the coast was settled. The rest of the country seemed illimitable bush. The seventy-mile bush ran up from the plain to Woodville, and the forty-mile bush from the gorge to past Dannevirke. The valleys of the Manawatu, Pohangina, Oroua, the upper reaches of the Rangitikei from Halcombe upwards were all bush, the whole of which is now cut down. Generally in the best timber areas the sawmiller was the pioneer, and the settler followed when the timber was cut out. Now there is not a sawmill in the whole of the area. I should not like to estimate the area that was in bush, but it must have been millions of acres. The Kauri forests are almost a thing of the past, Puriri scarcely procurable, and Totara very dear. The only source of timber for the North Island is the bush district in the central area, which cannot be nearly as large as that cut out. In the South Island there is still timber on the west coast, but more and more expensive to market, and the forests of Southland have been depleted. A recent forestry commission, which collected much valuable information, and made admirable suggestions in their report said, to meet our future requirements, we would need to plant 7,000 acres per annum. I doubt if we are planting even 700 per annum. Private individuals are doing a little. Already some plantations of soft wood have been cut

down and sawed into timber for building purposes. We must have large quantities of soft wood, possibly poplar and the Douglas fir planted, and the eucalyptus for hardwood for the future. It is acknowledged in all countries that this should be the work of the government. The government must be impressed by public opinion of the necessity to find money for this object. It has been decided to form a society to further the matter."

80,000 Miles Travelled by 60 Rangers

How much ground well-disciplined forest rangers can patrol is shown by the record of the Lower Ottawa Forest Protective Association. During 39 days, between April 20 and the end of May, 1916, the sixty rangers employed by the Association covered 21,678 miles of trails and highways, along all of which distance they maintained a vigilant lookout for fires, and performed numerous other duties. This works out to an average of about ten miles per day of climbing along difficult tracks through forest country and must be considered an excellent performance. The rangers, of course, were far from being continuously on patrol, as in the 39 days they issued 350 permits to set-

tlers for slash burning and built trails, repaired 'phone wires, etc. Last year the Lower Ottawa rangers travelled 80,000 miles.

The fires encountered through April, and May were 10 in number, of which six were ascribed to railways, and one each to settlers, hunters, fishermen, and a sawmill.

Evidence of the good use of telephone lines in forest guarding is shown in the construction last season by the firm of W. C. Edwards & Co., Ottawa, of a line from Montcerf to their Tomasine Farm Depot, a distance of 23 miles, this line connecting with a rural line that has been in operation some time between Montcerf and River Resert, a distance of 14 miles.

Negotiations are under way by W. C. Edwards & Co. and the Gilmour-Hughson Company to take over the latter lines and further the building of the forest telephone connections to their Ignace and Bark

Lake Depots. When the new lines have been constructed and connected with others at River Desert, a complete telephone service will be in operation between Ottawa and these important points.

Good Results of Quebec Laws

During the last session of the legislature of Quebec, several amendments were made to the Fire Act, which are calculated to add materially to its strength and efficiency.

One of these provisions requires that settlers engaged in clearing operations must, between April 1 and November 15 of each year, secure a burning permit from an authorized forest officer before setting out clearing fires. Wherever this provision is properly enforced, it will undoubtedly bring about a very material reduction in the forest fire loss. One of the most serious features of the fire situation in all the provinces of Canada is the tendency of settlers to burn debris during dry periods, when fire is likely to spread and cause serious damage. A similar provision is urgently needed in Northern Ontario, where there is practically no control of settlers clearing operations.

Another amendment to the Quebec Act provides that the debris from settlers' clearing operations must, before burning, be piled in heaps or rows at a distance of at least fifty feet from the forest. On this basis, it is much more practicable to control the fire than where the old method of broadcast burning is resorted to.

Holders of timber licenses on Crown lands are required to clear away the debris on a depth of one

hundred feet from railway rights of way. This is an excellent provision, but should be made applicable to privately owned lands as well. In many cases, the efforts of railway companies in the direction of fire protection are largely neutralized through the presence of large quantities of the most inflammable debris on lands immediately adjacent to railway rights of way.

Another excellent provision of the new Quebec Act is that any fire ranger or other forest officer may summon any male citizen between 18 and 55 years of age to assist in extinguishing any forest fire, the rate of pay being specified, and penalty being provided for failure to obey the summons.

The fire laws of the province of Quebec are among the most progressive in Canada, but larger appropriations are needed to make them fully effective. In particular, provision should be made for a larger staff of inspectors. The present staff is not sufficient to exercise proper supervision over the fire rangers on licensed lands, nor is there adequate provision for the protection of Crown lands not under license.—C. L. in "Conservation."

Give the Association a helping hand to pass the 4.000 mark before midsummer.

How Distribution is Cared For

As is known to most of our readers, the Canadian Forestry Association issues large editions of special educational literature. These editions are placed in the hands of settlers, campers, river drivers, railway men, tourists, etc., by the help of many agencies. The generous co-operation of the Canadian banks helps the association to reach in a most direct manner thousands of persons in the forested districts of the Dominion, although several channels, other than the banks, are utilised. Following are sample letters from bank managers in three widely separated districts, Newcastle, N. B.; Blind River, Ont.; and Lethbridge, Alberta, testifying to the fact that the Association's literature is put to good use:

Blind River, Ont.: "We have received two packets of booklets from the Association and will endeavor to distribute them as instructed."

Newcastle, N. B.: "We beg to acknowledge receipt of package of booklets dealing with forest protection. As requested by you we will distribute same to farmers, campers, railroad men and others."

Lethbridge, Alta.: "I beg to acknowledge receipt of booklets. We are distributing these where we consider they will do the most good."

From Sir James Outram, Vermilion, Alberta.

May 8, 1916.

"I shall be glad to become a member of the Canadian Forestry Association.

"Ever since my first experience of a Manitoba bush fire, 50 miles north of Minnedosa in 1884 and especially

after further experience during my camping trips in the Rockies, when mountaineering in 1901 and 1902, I have been particularly interested in the welfare of our timber inheritance and study of the problem when in the States, where I met Mr. Pinchot, has only added to this interest, so I thank you for this opportunity to join the Association."

On the Norwegian hills, the pine forests wage successful war with the bitter winds of the Pole; and in their sheltered rear the fruits of a milder climate ripen, and the toils of a happier land are carried on. Against the fierce storms of the Bay of Biscay, the pines of the Landes offer an effectual barrier; and meadows and pastures, forming the support of an industrious peasantry now appear where sand dunes once filled the air with their choking clouds, and spread desolation over the far horizon. The pine is, therefore, necessary to the equilibrium of nature. If ignorantly and wantonly removed from the situations where God has so wisely and graciously placed it, his benecent arrangements for the good of man would be completely frustrated."—Rev. Hugh MacMillan.

The Canadian Forestry Association

(Seventeenth Year)

119 Booth Building, Ottawa, Can.

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