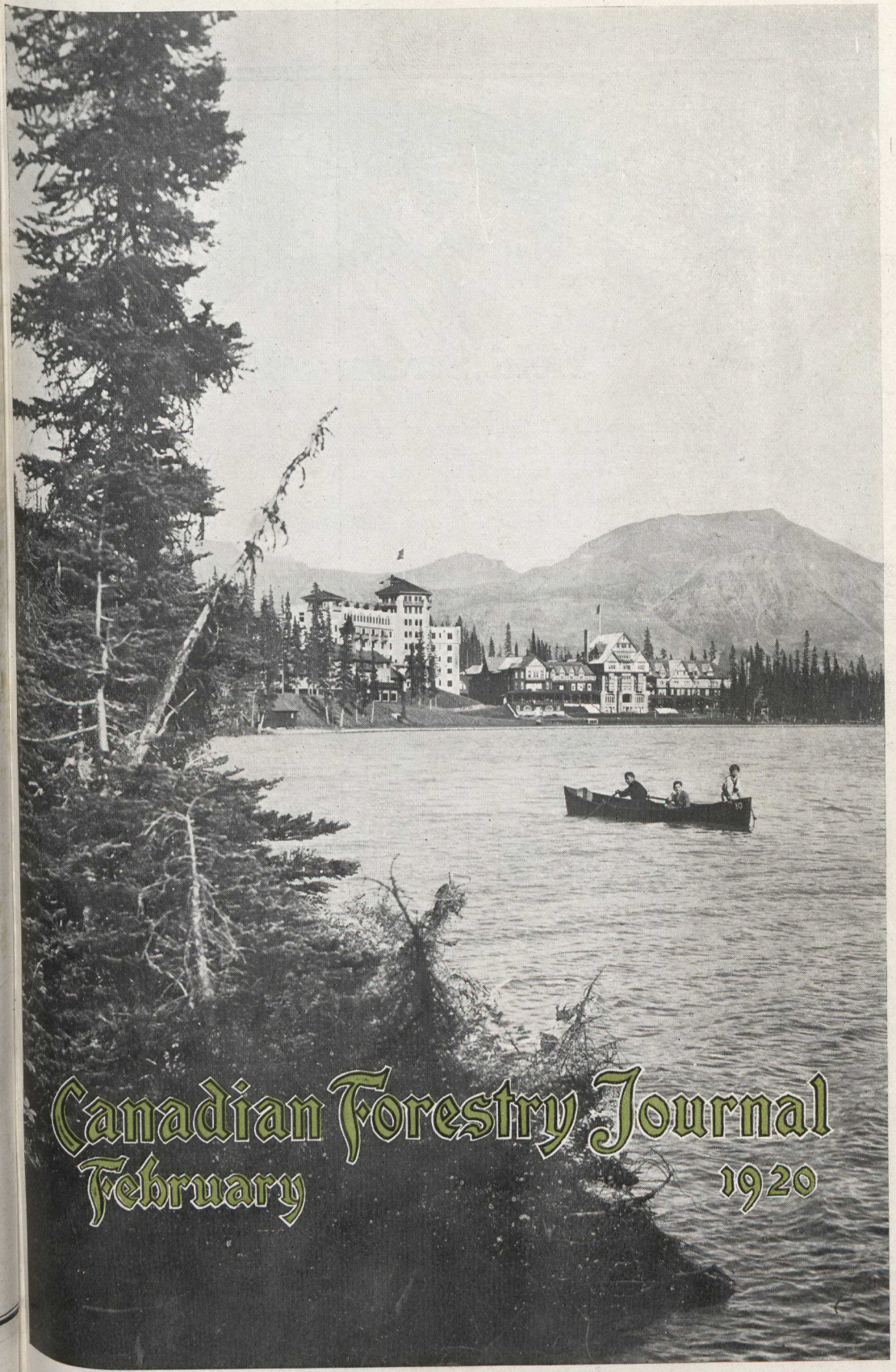


ON BEAUTIFUL LAKE LOUISE, ALBERTA.

ered at the Post Office, Ottawa, as second-class matter.

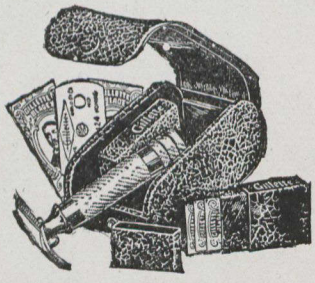
Field, Stream and Road

How strange the old-time pictures of sport would look today—baseball teams boasting at least half-a-dozen sets of whiskers—full-bearded cricketers—champions of the scull with their chins concealed.

Today the athlete knows the importance of the well-shaven chin. He is conscious that he is most keen when he is well-groomed—just as is the business man and the soldier.

For men who love outdoor life and sports, men of virile minds and active bodies, we have designed a Gillette Safety Razor with an extra stocky handle—the "Bulldog" Gillette, shown to the left.

Not that the Gillette needs a sturdy grasp. A light touch, with the angle stroke, removes the most stubborn beard with surprising comfort.



The "BULLDOG" Set includes oval Morocco Case with two blade boxes to match, and 12 double-edged blades.

But there is a certain appeal in the thicker handle of the "Bulldog". Ask to see this special set and appreciate the point for yourself.

The case, you will notice, is almost as compact as the famous Pocket Edition Gillettes, and the price is the same, $5.00.

Sold by all dealers catering to men's needs.

MADE IN CANADA

TRADE Gillette MARK

KNOWN THE WORLD OVER

Gillette

Safety Razor

573

CULATION: 11,500 COPIES MONTHLY. ROBSON BLACK, Editor.

Canadian Forestry Journal

VOL. XVI. OTTAWA, CANADA, FEBRUARY, 1920 No. 2.

SWEDEN'S SCHEME FOR GROWING FORESTS

By H. Claughton Wallin, Chief of Surveys, Dominion Forestry Branch, Fomerly in Swedish Private Forest Service.

Every Operator Judged by the Amount of Reproduction That Follows His Cuttings.

The total area of Sweden is 172,963 square miles, about half the size of Quebec.

More than half of Sweden is retained permanently for growing forest crops.

There are 23 Boards of Conservation Commissions, employing 33 foresters (graduates of the Royal Forest Institute), 210 permanent rangers and inspectors (who have completed a one-year course), and 861 overseers and "planters." These men have supervision of 41 million acres of privately-owned forests.

In addition to the foregoing staff on private lands, the State Forest Service in 1913 (the last figures available) employed 10 District Chief Foresters, 3 State Forest Engineers, 97 Forest Superintendents, and 155 Forest Assistants who were all technically trained foresters. The staff has since been considerably increased and would now amount to over 300 technical men. The number of rangers and assistant rangers, who must be graduates of a school of forestry (twelve months course) is between seven and eight hundred.

The State Forest Service has authority over 22,000,000 acres of state-owned lands, of which 12,500,000 acres are in Forest Reserves proper.

In 1918, the Forestry Boards restocked 70,000 acres by artificial seeding or planting.

About 71 million trees, mostly Scotch pine and spruce, and about 50,000 lbs. of pine and spruce seed were distributed. Two-thirds was supplied free or at a price less than cost. About 11,000 land owners received these supplies.

This does not include the extensive planting and seeding work done by the large estates and lumber companies which often have their own nurseries and, as a rule, their own foresters to direct the work.

One achievement of the Forestry Boards in 1918 was to drain bogs and swamps by constructing over 400 mlies of ditches.

Sweden's definition of proper forest management may be summed up as follows:

Any lumberman or other forest owner may cut by whatever method he pleases. He may cut the land clean or leave seed trees. But—and here we encounter the secret of Sweden's remarkable success In growing new forests—the cut-over areas must show after a reasonable time such abundant reproduction of young trees as will satisfy the rigorous examination of a Board of Foresters. In other words, Sweden says to the operator: "We are concerned in keeping the lands permanently under forest. We judge you by the state of your lands following cutting. If you cut clean you must replant at once. If you follow the selection method, leaving mother trees for seeding purposes, you must satisfy our examining officers that your lands are actually restocking in a way to develop a heavy forest growth in the futre."

Practically the whole of Sweden's private forests are "managed" by Boards of Conservation Commissioners, acting through trained foresters. The public responsibility for maintenance of the country's forest wealth has long been accepted and whether the operator owns his lands outright or, as is mostly the case in Canada, lease them from the state, the insistence upon scientific cutting and restocking is resolutely carried out by the public administration.

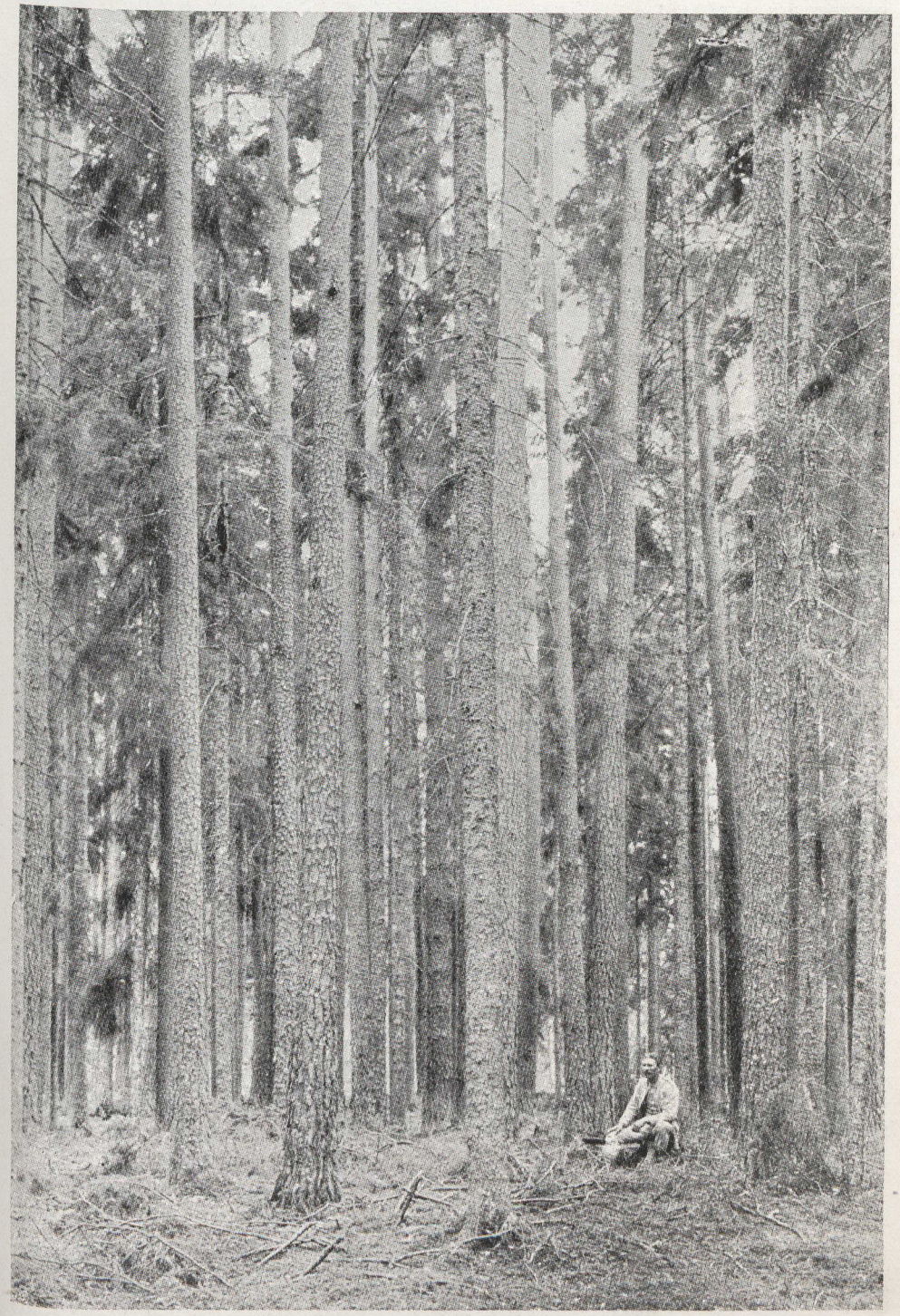
Sweden and Norway and Finland of all European countries, should be studied by Canadians interested in forest methods. Conditions are more closely analogous to those of Canada than is the case with France, Germany or Switzerland. French forest methods are discounted in Canadian eyes by the great disparity between important economic onditions in the two countries. Sweden, however, is not materially unlike Canada in the various considerations that would make comparison of forest methods suggestive and helpful.

Following are the most important clauses of the Swedist forest law and a few words about its execution:

On private woodlands cutting and the management of the land after cutting shall be carried on in a manner that will not obviously jeopardize reforestation.

If neglect is proved, owner is held responsible and is compelled to take such measures as are necessary to secure the establishmnt of a new stand.

A Board of Conservation Commissioners shall be elected for each county revenue district and together with the foresters appointed by them and the forestry commtitees for the parishes they shall exercise control.



Sweden's great wood crops. Here is a stand of Norway Spruce and Scotch Pine in Central Sweden. It is of an even age, having followed a fire set by farmers 140 years ago.

Forests that are making Sweden's fortune. A stand of spruce 70 years old with forest officer in uniform.

If it is found that woodlands are not given necessary care, the Board of Commissioners shall call for a government investigation. An officer of the state forest service is then instructed to examine the land in question and to report to the board, suggesting such measures as he may deem necessary for the establishment of proper forest cover.

After consideration and approval of the government forester's suggestion the board shall make an agreement with the owner of the neglected or mismanaged land, the owner agreeing to carry out the written instructions of the board.

If the two parties cannot come to an understanding or the owner fails to carry out the instructions of the agreement, the board shall prosecute the party concerned in court.

Here we find a Swedish forest of spruce and Scotch Pine, worked on forestry principles. It is 40 years old and has been thinned once.

The court then orders what steps should be taken in the case necessary for the securing of forest cover on the land in question and also fixes a time in which the work shall be done at the risk of the board carrying out the orders of the court at the expense of the defendant.

The court may also prohibit a further cutting on the whole or on a part of the defendant's property until the orders of the court are carried out, unless the defendant provides security for the fulfilment of the order.

If contrary to the decision of the court cutting is done the guilty party is sentenced to a fine, the timber being forfeited to the crown.

If the defendant does not possess funds for the paying of the fine, he may be sentenced to a corresponding time in prison.

This law does not prevent the owner of woodland from clearing any part of his land for cultivation, pasture or the erection of buildings.

Besides having to exercise control as mentioned above it is the duty of the Forestry Boards—

To encourage silviculture by spreading knowledge of forest management;

,To give pecuniary help for silvicultural work, and if necessary perform the work;

To furnish owners of woodlands with seeds and plants—free, or at reasonable prices;

To furnish advice in the handling of woodlands; in short

To encourage as much as possible the practice of intensive forestry on private forests and woodlots.

It is also the duty of the board to administer the revenue received in each county revenue district from the export duty on timber, lumber, cordwood, pulp and pulpwood.

Other sources of income are yearly grants from the state and the provincial governments and also to a certain degree the sale of seed and plants.

Seed and plants as well as assistance in the work are only furnished free when the applicants are in poor circumstances.

ASSOCIATION AND ONTARIO'S FOREST POLICY

"Resolved that the Canadian Forestry Association desires to place itself on record as heartily approving of the expressed intentions of the Government of Ontario to bring the Department of Lands and Forests of that Province up to the highest possible state of efficiency."

Passed at a meeting of the Directors held at Ottawa, February 17th, 1920.

WHAT FOUR YEARS CAN DO ON THE PRAIRIE.

Tne upper picture shows a Scotch Pine plantation made by Mr. Norman Ross on the Spruce Woods Forest Reserve, Manitoba. The first photograph was taken in 1915, the lower one in 1919, showing remarkable growth in the four years.

HAVE YOU A WOODLOT GOING TO WASTE?

By B. R. Morton, B.Sc.

About that undeveloped woodlot or woodland on your place? Mr. B. R. Morton, B.Sc.F., of the Dominion Forestry Branch, will take up with you in this and future issues of the Forestry Journal the question of making a maximum profit from it. The following is introductory:

It is frequently said that the farm woodlot in Eastern Canada needs no attention because trees will grow without care. True, trees will grow with little or no care. So will an orchard or a field of potatoes grow without care. But if we are looking for the best returns from our orchard or potatoes, we must give them attention. Just so with the woodlot, we must look after it if we desire the best results. A woodlot well established and in good condition requires very little attention, but this little attention pays well.

Perhaps the greatest objection made to caring for the woodlot is the time it takes to produce large sized timber. On the farm, however, there are many uses for the small and medium sized forest products that take a comparatively short time to produce. On many woodlots a thrifty young growth already exists, and it will not require many years before this is sufficiently large to use. A little attention will shorten considerably the time required to produce marketable material.

The demand for small dimension materials is steadily increasing because the scarcity of wood in large dimension is forcing the manufacturers to use built-up wood. The war has done much to increase our knowledge regarding the possibilities in the use of "laminated" products, of which the airplane is an example. This use of wood in small sizes makes it possible to market the products of the woodlot, while the trees are comparatively young.

There are many reasons why it is good business to maintain a woodlot on the farm. Without it, it becomes necessary to purchase the fuel, posts and other wood material required about the place. Few farms are so small that it would not pay to maintain a small part under trees. The woodlot gives the farm as a whole a higher value. Even when it has been started artificially by planting and the trees have not yet reached merchantable size, they have value. Planting a woodlot is a sure and safe way of building up a bank account for one's old age or one's children.

On many farms there are one or more waste areas, patches that are not suited to agricultural crops. The soil on them is sandy or perhaps the surface is too rough, stoney or steep to allow it being cultivated. Why allow these waste areas to remain idle generation after generation when with a little initial cost they can be made to grow trees that will be increasing in value as you sleep. Each piece of ground should be used for the purpose for which it is best suited—a poor piece of soil should not be abandoned merely because it will not yield so large returns as the remainder. There is no part of the farm so poor that it will not produce tree-growth.

THE FOREST IS THE PROP OF THESE INVESTMENTS.

A preliminary report on the pulp and paper industry in Canada has been compiled by the Dominion Bureau of Statistics for the calendar year 1918. The statistics are presented for each class by number of mills as follows: Pulp mills 37, paper mills 31, pulp and paper mills 26, or a total of 94 mills.

The total capital invested in the industry was $241,344,704, of which $12,520,765 was invested in paper mills, $71,708,223 in pulp mills, and $157,115,716 in pulp and paper mills. Classified by items of capital, land, buildings and fixtures, amounted to $117,805,581, machinery and tools to $60,627,266, materials on hand, stocks in process, etc., $39,6__52,078, and cash, trading and operating accounts and bills receivable to $22,259,779. By provinces, the amount invested was: British Columbia, $42,705,988; Ontario, $88,576,807; Quebec, $101,456,296; New Brunswick, $7,852,225, and Nova Scotia, $753,388.

MR. BARNJUM'S TIMELY AID.

The Canadian Forestry Association has received from Mr. Frank J. D. Barnjum, of Annapolis Royal, N.S., a gift of one thousand dollars to aid in developing forest protection propaganda in all parts of the Dominion.

Mr. Barnjum's generous gift came in response to an appeal to help make up the deficit in our income caused by the unexpected cancellation of the Dominion Government's grant of four thousand dollars a year.

In an article in the Pulp and Paper Magazine recently, Mr. Barnjum offered to subscribe ten thousand dollars to the Canadian Forestry Association provided that the chief pulp and paper companies of Canada would do likewise.

THE WOODLANDS MEETING.

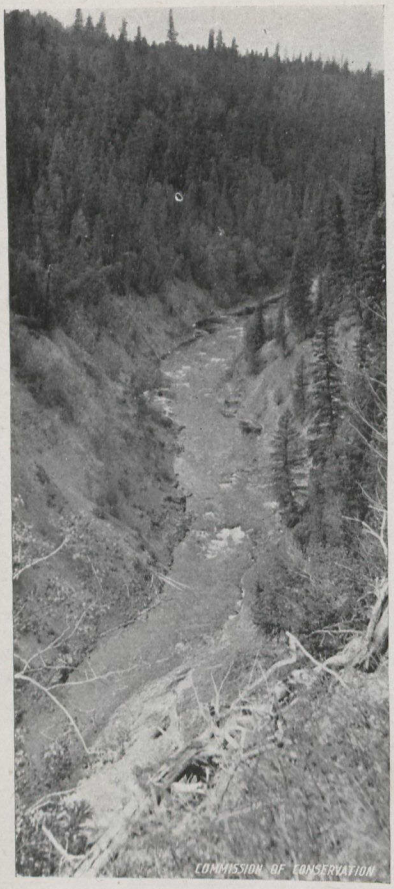
The meeting of the Woodlands Section of the Canadian Pulp and Paper Association at Montreal on January 29th, drew an excellent attendance from many parts of Eastern Canada. In the absence of Mr. Ellwood Wilson an address on Aerial Photography, illustrated with lantern slides and photographs, was given by Mr. Stuart Graham, who conducted the aviation experiments in the St. Maurice Valley last summer. Part of Mr. Wilson's paper will be given in the next issue of the Forestry Journal. Mr. R. P. Kernan acted as chairman.

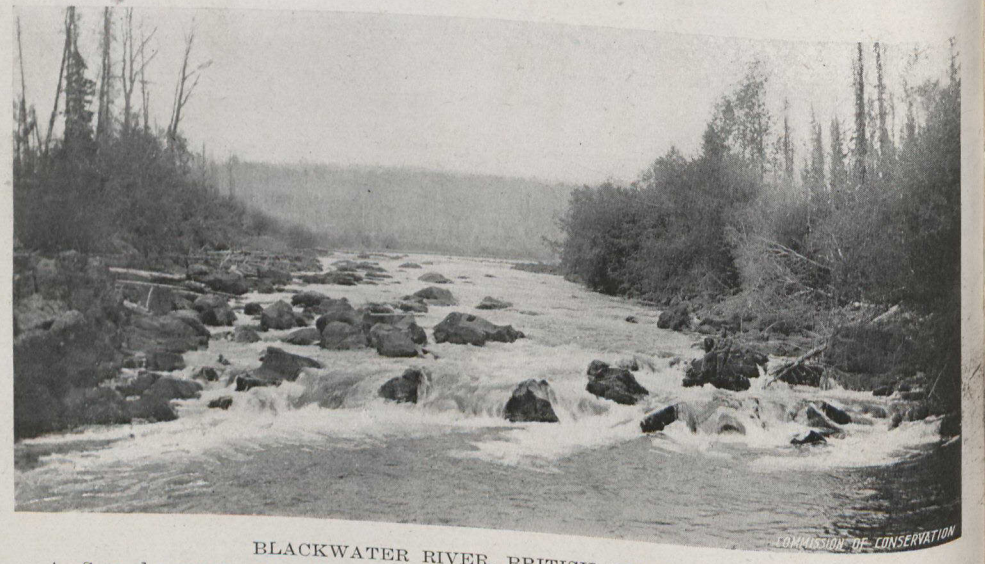
TWO TREES THAT GROW AS ONE.

A British Columbia picture of two Douglas Firs completely grafted.

"Men of the wilderness, fierce mountains love you;
Proud rivers leap when you ride on their breast;
See the austere sky, pensive above you,
Dons all her jewels to smile on your rest.
Children of Freedom, scornful of frontiers,
We who are weaklings honor your worth,
Lords of the wilderness, Princes of Pioneers,
Let's have a rouse that will ring round the earth."

ROBERT W. SERVICE.





BLACKWATER RIVER, BRITISH COLUMBIA.

A—Second canon near mouth. Very typical of many deeply eroded river channels in the interior of the province.
B—Fall below Tsacha lake.
C—Canon at Telegraph Trail crossing.
D—Cascades below Chine lake.

HINTS ON SELECTING SHADE TREES

By F. E. Buck, B.S.A., Assistant to Dominion Horticulturist.

In nearly all cases it will pay to procure good nursery-grown trees. They have two distinct advantages over trees dug up from the fields or woods. In the first place they generally have a larger number of feeding roots, enabling them to withstand the transplanting process better, and they are better able also to withstand heat and light conditions which prevail in towns and cities, young trees growing in woods generally being weakened by the shade of surrounding trees.

The question of the size of the tree is of some importance. Greater success is possible when small or medium-size trees are used. A large-sized tree requires more attention after it is planted, to tide it over the critical period following transplanting. Elms and maples are generally procurable in larger sizes, and are more likely to succeed ,than most other varieties.

For wide streets ,avenues, or boulevards, trees of the type of the elm, which is remarkable for its vase-like and graceful form, are more suitable than compact round-headed trees, of the type of the Norway maple.

Trees of the type of the Silver maple or even the Carolina poplar should not be selected except for some special purpose. The wood of such trees is soft and brittle, and limbs are easily broken off in sleet or wind storms. The risk of damage to life and property at such times must be considered in selecting such trees.

Trees which have a natural beauty which is spoilt when they are pruned of their lower branches, such as the beech, the Weeping Silver maple, or the Weeping birch, are not suitable for streets or avenues.

Trees which shed their flowering, or fruiting organs, such as the Balsam and Carolina poplar, the Horse chestnut, or the Catalpa, and keep the sidewalks untidy for some weeks each year, are not desirable street trees.

Trees which are short-lived ,or subject to insect attacks, or are difficult to transplant, are not as a rule desirable for city streets.

TIME TO PLANT.

The very best time of the year to plant all kinds of trees and shrubs is early in the spring before the buds begin to burst. The actual dates vary with the season and the locality. As a general statement, it may be said that in April or early May would be all right, or just as soon as the ground has thawed out and dried out sufficiently so that the soil is mellow enough and suitable for working in well around the roots. Periods of dull weather afford a good opportunity to do planting successfully.

Where the planting can be more conveniently accomplished in the autumn, the best period to plant is as soon as the leaves begin to fall, which is generally the latter part of October. Evergreens, however, must be planted earlier than October. In September and not later than the 15th has been found to be a good time to plant them. Planted at that time, they have an opportunity to become established before winter sets in.

DISTANCES APART AND POSITION.

The area of the root system of any tree is generally equal to, and in a few cases greater than, the spread of the branches above the ground. Therefore if the branches of two trees meet their root systems will interlock, and it is important to take this into consideration in the planting and care of street trees, otherwise the proper provision of an adequate feeding area may be overlooked. Trees may be slowly starved to death, in which case, many of their large limbs die, and disfigurement of once handsome trees is the result.

In most city streets of a residential character, the best position for shade trees is in what is called a "Parking Strip," which is the strip of ground or greensward between the curb and the sidewalk. It is well not to have this less than four feet wide, and in this strip the trees should be planted at distances ranging from forty to fifty feet apart. When the roadway is first built, and the width of the street from house line to house line permits, it is best to make such strips ten or twelve feet wide. Frequently, of course, no "Parking" strip is provided, and in such cases the trees must be planted on the strip between the sidewalk and the houses. Streets sixty feet wide from property line to property line, may be laid out to advantage as follows: Soil space between the property and the sidewalk, four feet; sidewalk, five feet; planting strip, six feet; roadway, thirty feet.

No street should be planted with more than one variety of tree, and these should be planted at uniform distances apart, and in an even line.

ONTARIO FARMERS WANT TO COMMENCE TREE-GROWING

A sign of the farmers' interest in this important matter of increasing the forest area was given at the meeting of York (Ontario) County Council, by Reeve George Padget, of Markham Township, a farmer representing one of the best agricultural districts in the country, moving the appointment of a committee to investigate the possibilities for acquiring land in the county for reforestation by the county authorities. The council was unanimous in supporting Reeve Padget's suggestion, and in discussion of the matter members advanced strong arguments in favor of reforestation, not the least important of them being those in reference to the effect of forest growth on stream regulation, in preventing the occurrence of blow sand areas, and in providing refuge for wild birds; all matters affecting agriculture most directly.

Particularly interesting information with regard to the results of removing pine from sandy land without making provision for the encouragement of second growth was provided by Mr. F. Stickwood, a member of the council representing the Township of East Gwillimbury.

Mr. Stickwood spoke out of his own experience of lumbering pine on sandy land in the north-eastern portion of the county, with a view to growing crops on a portion of the cleared area. In cases where the second growth pine had been given reasonable encouragement by leaving the surrounding tree growth fairly thick, good results in the way of new timber had been attained. But where the land was cleared for the growth of farm crops ,and not provided with a libertl supply of humus artificially, the result had been disastrous after two years of cropping.

Interviewed with regard to the possibilities for growing crops on sandy land from which pine had been removed, Mr. Stickwood went into particulars of his experience on his own farm. For two seasons after removing a fine growth of pine from what is now one of his back fields, he secured excellent crops of fall wheat. But after the second year the black surface soil began to drift, and the subsoil that was left—a sharp sand—proved anything but satisfactory for crop-growing. Mr. Stickwood was emphatic in declaring that the pine land should either be kept in pine or, if cleared, should be treate dimmediately with heavy applications of barnyard manure in order to keep the good soil in place and provide for a supply of fertility for a considerable period.

COL. J. S. DENNIS' MESSAGE.

From a telegram sent to the annual meeting of the Canadian Forestry Association at Quebec by Col. J. S. Dennis, Chief Commissioner of Colonization and Development, Canadian Pacific Railway:

"The Association is doing magnificent work and is deserving of the strongest support possible from all Canadian interests."

In the December issue of the Forestry Journal omission was made of an acknowledgement to Mr. G. B. Sudworth, Dendrologist of the United States Forest Service, Washington, D.C., for his courtesy in allowing the use of a photograph showing a Sequoia tree stump.

"I believe the work you are doing is so important and the demands on your members so moderate that you should receive all the support possible."—Chas. M. Cotton, Barrister, Montreal.

"Personally, I consider the work of your Association is doing is very beneficial, not only to the holders of limits, but to Canada as a whole."—Col. William Hendrie, Hamilton.

"Anything that I can do to further the objects of your Association will afford me sincere pleasure."—Dr. J. L. Chabot, M.P., Ottawa.

"I sincerely hope the Federal Government will be prepared to back any action approved by your Association."—Major Hume Cronyn, M.P., London, Ont.

"I have always appreciated the great work the Canadian Forestry Association has been doing and have been studying your publications."—Fred V. Seibert, D.L.S., Edmonton.

"I am heartily with you, and am willing to do anything within reason to assist. I like the forest, and when I answer its call I like to find green trees and grass and not black stumps and ashes."—E. A. Paulson, Winnipeg.

PUTTING IN TREES WITH A PLANTING BOARD.

Planting seedling trees by the million at Indian Head Nursery Station, Saskatchewan. The Yale Board, which holds about fifty seedlings at one time, is filled by the women working at the portable cabin. A series of planks is used as a straight-edge and a workman with a spade makes a V-shaped trench. The loaded planting-board is then placed in the trench and earth is pressed against the roots. One side of the board swings open and the machine is withdrawn leaving the seedlings firmly in position, equally distanced. This method makes tree planting a rapid and accurate process.

Photo by B. R. Morton, Ottawa.

AN UNCOMMON TRICK OF NATURE.

The original Red Oak tree stood high on the slope. A land slide split the roots and moved one section many feet down the hill, but did not completely divide the upper trunk. As a result, both roots have continued to grow and the central trunk has thoroughly healed over.

SIR LOMER GOUIN'S ADVICE ON FORESTRY

(From report of address to Canadian Pulp and Paper Association)

They should not forget that their supply of pulpwod was not inexhaustible. Formerly they had been very exacting, but now they were using balsam and short trees, to the advantage both of their men and of their forests, which became more productive as they were cleaned.

Sir Lomer's advice was to only cut from timberland what the timberland produced yearly. This would mean increased expenditure, but such expenditure would make the limits produce more, and give them a chance to return sooner to fields which had been exploited.

It was not sufficient to reduce the volume of cutting. They should think of restocking the timberlands. If they would do their share in this direction, the Quebec Government would do its share, and a big share (applause). He had heard pessimistic views about the forests, but he had great faith in their future. Quebec Province had more than half the pulpwood supply of Canada, and the largest extent of pulpwood forest left in the world, and this forest, efficient-managed, could be made to produce enormous quantities for ever.

The Quebec Government proposed making an inventory of the virgin forests, and had established forest posts at Hamilton Bay, Ungava Bay, and James Bay, which it was proposed to connect by wireless and supply with airplanes.

They realized the importance of keeping Quebec produce for Quebec mills, and would not hesitate, if necessary, to limit cutting to the use of mills in the province.

They had created schools in the cities of Quebec and Montreal to meet the need for highly trained technical men, and if a school of paper-making were required, they would give it. He would ask in return that as a good investment, the manufacturers should do all possible to encourage these schools. By so doing they would help the recruiting of the best artisans and technical men for their work.

AN OLD WHIPPING POST AT ANNAPOLIS ROYAL, NOVA SCOTIA.

An historical group of willows, the centre one having been planted during the French regime.

CANON ON WILLOW RIVER, B.C.
Suggested development for Prince George hydro-electric supply

NECHAKO RIVER, B.C.
Grand canon above outlet from Cheslatta lake.

GOVERNMENT RAILWAYS *and* ADJOINING FORESTS

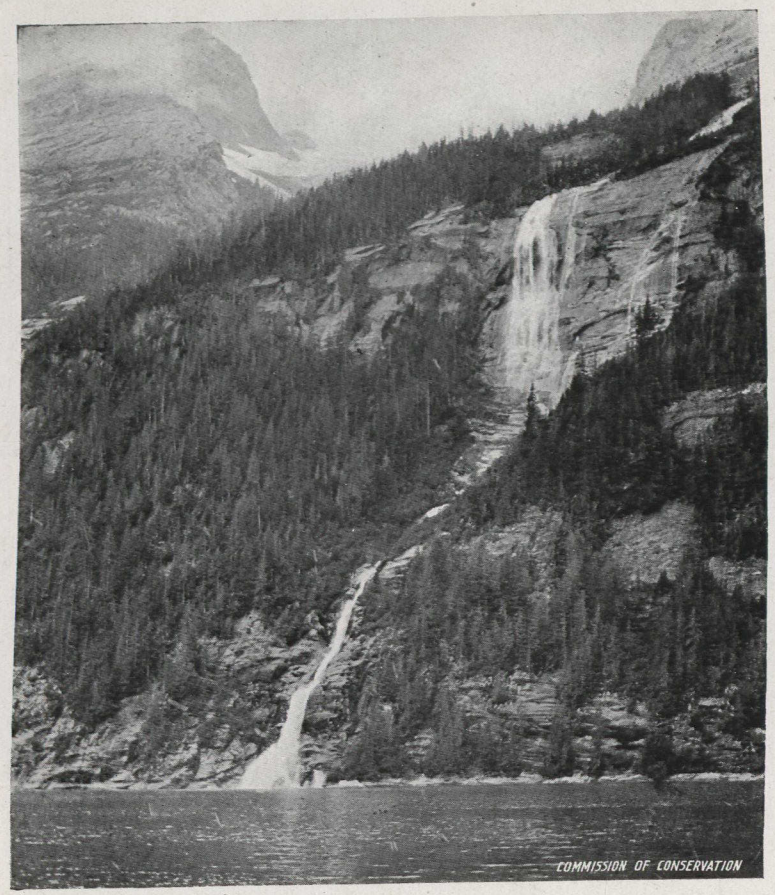
It has always been a queer anomaly that the Canadian Government should make fire prevention laws applicable to the company-owned lines, and not to Government railways. Whatever betterments in fire protection on Government railways has come about is due to more or less personal and local arrangements between provincial forest protective organizations and government railway executive officers. This, of course, does not apply to the former Canadian Northern lines which have retained their efficient protective arrangements under the new form of management. At the meeting of the Quebec Forest Protective Association at Montreal, January 28th, the following resolution was passed:

"That delegates be appointed from the province of Quebec to accompany those from the provinces of Ontario and New Brunswick who will place before the Federal Government the desirability and urgent necessity of placing under the jurisdiction of the Board of Railway Commissioners those railroads which are not now subject to that Commission with regard to forest protection.

"That a copy of this resolution be forwarded to the Governments of the Province of Quebec, Ontario and New Brunswick, as well as to the Canadian Lumbermen's Association, accompanied by a request that they give their support to the said resolution.

"That the Government of the Province of Quebec be petitioned to place all owners of private forest lands amenable to the obligations and penalties contained in Clause 1641 of the Revised Statutes of the Province of Quebec, which now are only applicable to the owners of lands under license."

Bute inlet. Mount Superb, elevation about 8,000 feet.



Gardner canal, showing stream of intermittent type descending from glacier above.

TYPICAL VIEWS OF THE BRITISH COLUMBIA COAST LINE BORDERING THE INLETS.

KEEPING COAST FORESTS PRODUCTIVE

By Hon. T. D. Pattullo, Minister of Lands, Victoria, B.C.

Scientfic Study Necessary to Surmount Forestry Problems and Keep the Areas Permanently Under Wood Crops.

Timber is, and always will be, one of the main assets of this province. The commercial prosperity of our cities and towns and villages depends very seriously upon forest industries, while in country districts, development is helped forward by money which the latter derives from the marketing of minor forest products. Responsibility is upon the Government of the Province to safeguard the future of forest industries as well as to assist in their present day development.

FIRE PREVENTION.

In an ordinary year, more than a thousand organized logging operators cut into the present stand of timber. There is each summer inevitable destruction by fire. Insects make heavy inroads in some localitites. The question that must never be lost sight of is this, what is happening in the aggregate to this source of provincial wealth? Are we securing necessary information to enable us to know? Are our plans for protection and management adequate?

Necessarily the first duties of the Government department in charge of forestry have been to set up efficient machinery for forest fire prevention, revenue collection and all such matters of current administration. The long five years of war prevented any general attempt to do more than deal with daily business. But with the return of men from overseas, it has been possible to review the whole field of work and to provide, in reorganizing the department, for definite study of the condition of our forest resources to be undertaken. From now on such study will be carried on side by side with administrative work.

ESTIMATE OF SUPPLY.

More or less conjectural estimates have been made of our forest areas. In a recent statement, the mature merchantable timber is figured as covering something over 40,000 square miles. Two and a half times that area—some 97,000 square miles—is thought by officers of the department to be productive forest land on most of which, young timber is growing up after previous destruction of the crop by fire and logging.

In the moist region of the Coast, we have some of the fastest growing timber in the world, a fact established by actual investigation which has shown, in places, an annual increase of Douglas fir, amounting to 1,000 board feet per acre. Generally speaking, our knowledge of rate of growth throughout the province, is very meagre. Cedar, for instance, is thought to be coming back slower than other species, though it grows fairly rapidly to pole size. In the interior, growth is, of course, far slower than on the coast, and already in certain sections, this matter is arousing attention because the immediately accessible timber of the present mature crop is beginning to approach the cut-out stage. But making all due allowance for annual loss from fire and insects and decay, the estimated average increase of 100 board feet per acre every year certainly appears conservative. Yet at this figure, the area of young growing forest now conjectured to exist would show an increase each year of something over six million feet, five times the annual cut at present.

DIMINISHING SUPPLY.

It is this figure which has aroused considerable criticism among lumbering operators who are faced, in their business, with an obviously diminishing supply of immediately accessible timber. Yet while a great proportion of the young forest is away back from present means of operation, it is there, growing up against the time when the cutting out of the present mature crop will compel the extension of operations into it. At the same time a note of alarm is struck by the statement of one investigator, who finds that half the logged-off lands in the southern coast region, are not sufficiently stocked with young growth. Plainly it is the duty of our forest service to secure definite information to replace such conjectural calculations, as those foregoing, since, in reality, the margin of safety may be far less than is supposed and

future policy in disposing of Crown timber cannot be soundly planned without. Attention to this is made more necessary because the cutting out of the timber supply of the Southern States, which has been so abnormally speeded up by war and reconstruction needs, will soon subject our western forests to a vastly increased demand.

YOUNG TIMBER SUFFERS.

While fires in mature timber are those most noticed, it is the young, growing forest that suffers most. Repeated burnings in areas no longer able to reseed themselves readily, destroy reproduction for long periods of years, and result in brush and scrub, where good young timber should be. From the reforestation point of view no duty comes before protection of young growth from fire—that is to say, young growth on true forest land. Obviously, for a Government department there is consequently the duty of land classification, so that that which is fit for agriculture, should be separated from that which nature properly devotes to forest reproduction. And to secure the future crop, forest fire prevention is the supreme duty of all.

It is upon this that our department has mainly concentrated hitherto. Through the adoption of up-to-date methods and most modern equipment ,every effort has been made to establish a high standard of efficiency. The increased cost of everything, makes necessary a corresponding increase in the fire tax to 2 cents an acre—cheerfully agreed to by the interests taxed —while the fire patrol system has been strengthened very considerably by the re-organization of staff, just completed. Prevention of forest fires is not the only matter involved—there is also the vitally important question of using fire to secure right reproduction, a question that needs careful and imediate study by the investigation office of the department.

INSECT DAMAGE.

Widespread devastation by bark beetles of some of the most valuable timber areas of the Province is taking place in the yellow pine country. Thirty million feet is the estimate of damage done in the Princeton section—no one knows the full extent of the loss. The whole stand of yellow pine in the interior is threatened with extermination.

STUDY OF DAMAGE.

Scientific study seems to promise some slight hope of checking the devastation, and a combined effort is being made this winter by the department and the timber owners concerned, with the co-operation of the Dominion Entomologist, to see what can be done in the recently attacked area of the Coldwater Valley. More than the loss of timber is at stake—there is the loss of industrial activity, commercial business, public revenue in the sections of the Province thus affected. The winter's work is concerned with cutting and salvaging the infested timber and burning the debris from it, so as to destroy the insects before they migrate to fresh timber in the spring. Provision is being made in the forthcoming estimates for continuing control experiments and everything that the department can do to hold the devastation in check will be done. Here again is shown the grave necessity of carrying on forest investigation as a maojr function of the department. Insect damage obviously offers a most difficult problem since the cost of control may in some cases be prohibitive; and it is by no means confined to yellow pine. Larch and lodgepole pine in the C. P. R. tie reserves in the Yahk country are known to be infected. The spruce budworm is reported in the Lillooet district and on Vancouver Island. and public attention has been drawn to the damage done in the big timber in Stanley Park. The blister rust is threatening extermination of the eastern white pine. Measures have been taken to prevent its spread westward, but we must watch carefully for it here.

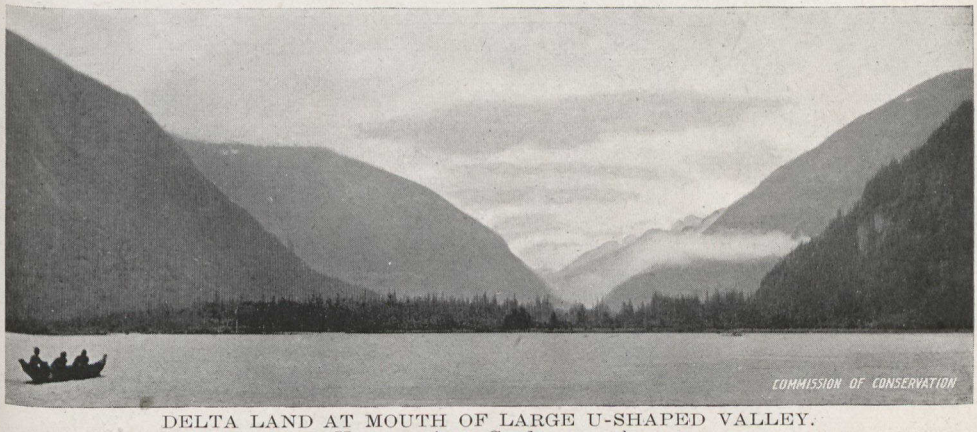
PULP INDUSTRY DEVELOPMENT.

On the coast the pulp and paper industry is already on an established footing. The vast pulpwood areas of the interior and the north are still untouched. Increasing exhaustion of supply in the Eastern States means, inevitably, development of the pulp industry in interior British Columbia, in the near future. To compile information concerning our resources as a necessary function of a forest investigation office.

FORESTRY IN 1920.

The collection of a three million dollar forest revenue and the carrying out of current business, including the organized prevention of forest fires, is thus only one side of the work the department must carry on in 1920 if it is to discharge its duty properly. Vague theoretical studies are not in question—there is direct necessity for investigation of matters which have a practical bearing on current business and plans for the immediate future. Information is needed as a guide in the use of fire after logging, especially now that the law provides for a comprehensive scheme of slash disposal all over the province; as a basis of regulations in

CHARACTERISTIC VIEW OF INLET ON COAST.
East arm of Matheson channel.



DELTA LAND AT MOUTH OF LARGE U-SHAPED VALLEY.
Kemano river, Gardner canal.

HOMATHKO RIVER, LOOKING DOWNSTREAM TOWARDS BUTE INLET.

selling Crown timber; to secure proper land classification ; to ascertain the real facts about reforestation and to show what can be done to hasten and improve the new crop.

BEST SPECIES REQUIRED.

We do not want inferior species to reproduce at the expense of better ones; we do not want money wasted on measures which fuller information might prove unnecessary. We need timber maps and yield tables and sample plots; data to furnish our cruisers with when estimating sale timber; establishment of working plans for large untouched, unalienated areas of reserve timber, such as the Yahk basin; much technical information which war time has made it impossible hitherto to secure. Forest investigation must be recognized as an essential of forest administration. Not for their wrecking value, but as a perpetual crop must we administer the great timber resources of British Columbia.

PRAIRIE TREE PLANTING ON WHOLESALE BASIS

Readers of the Forestry Journal who have followed recent articles on tree planting on the prairies will read appreciatively this editorial from the alert "Regina Post":

It is interesting to note that a committee of the Legislature under the chairmanship of Mr. Murdo Cameron (Saskatoon County), spent a couple of hours yesterday hearing an address on the project of tree-planting, and discussion of the topic.

The subject is one which the Post has dealt with in several editorials. It is a small matter, in a way, and yet a very important one, inasmuch as tree-planting will do a great deal in the way of making Saskatchewan a better place to live in. Every home in the province can be made more attractive and more of a real home with the expenditure of comparatively little money and time. And at the same time several hundred dollars may be added to the value of every farm.

MORE TREES REQUIRED.

Two considerable handicaps to Saskatchewan are the cold winds which sweep over the prairie in the winter time, and the hot winds which dry the soil so rapidly in the crop season. The cold winds of the winter make life on the farm much less pleasant, and make it more difficult to care for live-stock. The roads are blocked by snow-drifts, and the farm folk find difficulty in getting to town or in visiting their neighbors. The hot winds of the summer take moisture from the plowed grounds at a rapid rate. Both can be greatly ameliorated by tree-planting along the roads, around the homes, and in clumps at convenient locations.

No one who has lived on the prairie needs to be told the difference in conditions observable when driving from the open prairie into an avenue of trees. There is actually no difference in temperature, of course, but the difference seems to the wayfarer about thirty degrees because of the wind-break. The home is more easily heated when surrounded by trees. Live-stock can be left out in much more severe weather. In the summer time the trees bring more moisture to the soil and retard evaporation by breaking the force of the hot breezes.

THE MENACE OF CONSTANT WIND.

The tree nurseries of the Dominion Government at Indian Head and at Sutherland are supplying millions of trees and cuttings to the farmers of the province every year, and the appearance of the "treeless prairies" is slowly being altered, as everyone who travels over the country knows. But the pity is that the number of trees set out each year is not multiplied by four or five or six. They are obtainable free of charge, and each one adds sufficient value to the farm on which it is planted to amply repay the farmer for any expenditure of time or energy necessary for the work. Along with the trees, by the way, the nursery stations supply full instructions as to planting methods.

Whatever assistance the government and legislature can give to advance the work of tree-planting ought to be given. It might, for instance, assist the municipalities in getting the roads lined with trees, by providing part of the money to defray the cost, just as it does with actual road construction.

ESTABLISHING A PRAIRIE TREE PLANTATION.

The upper picture was taken in 1916 and shows the preparation of land for tree growing at Indian Head, Sask. Some of the trenches have already been filled with young spruce trees.

The lower picture was taken over the same area in 1919, and illustrates rapid and healthy development.

THE ASSOCIATION'S ANNUAL MEETING

At the annual meeting of the Canadian Forestry Association, held at the Chateau Frontenac, Que., on Feb. 3rd, Mr. Clyde Leavitt acted as Chairman, in the absence of Mr. J. S. Gillies, the President.

A motion was introduced by Mr. R. O. Sweezey favoring the increase in the number of Directors of the Association from 35 to 45. Mr. Sweezey explained that since the Association's original board had been appointed, relatively few changes in personnel had occurred, and several important interests, such as the publishers, the banks, and the people of the prairie provinces were now inadequately represented. The motion carried without dissent. The Nominating Committee submitted to the meeting a list of officers and directors, with Mr. C. E. E. Ussher (passenger traffic manager of the C.P.R. and one of the first directors of the Association) as President, and Mr. Dan McLachlin of Arnprior, Ont., a well-known lumberman, as Vice-President. The following new Directors were appointed: Hon. Arthur Meighen, Angus McLean, J. A. Gillies, John Black, T. W. Dwight, Col. Thos. Cantley, W. E. Golding, Hon. N. Garneau, David Champoux, Avila Bedard, W. E. Bigwood, Cyril Young, Vere C. Brown, John W. Dafoe, G. P. Marnoch, R. O. Sweezey.

The Treasurer's report for 1919 showed receipts of $20,167.00, including $4,600 from Government grants; $7,565.78 from membership fees, and $6,840.00 from special subscriptions. Expenditures amounted to $20,072.58, leaving a balance at Dec. 31, 1919, of $1,024.33.

Col. Harkom brought up the question of appointing regional committees, or boards ,to advise the Central Executive regarding special local problems. A motion was put through embodying the suggestion and commending consideration of it to the incoming executive:

The following resolution was passed:

"Whereas, the Canadian Forestry Association has demonstrated its usefulness in the spread of forestry propaganda throughout Canada and has endeavored to be of maximum usefulness in the protection of the forests administered by the Dominion Government;

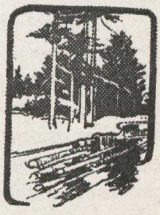
"Resolved, that this Association, here assembled, petition the Minister of the Interior to restore the annual grant of $4,000 hitherto given to the Association's work, and recently suspended."

BRIDGE RIVER VALLEY ABOVE CANON, BRITISH COLUMBIA.

THE YEAR'S STORY OF OUR ASSOCIATION

(Constituting the Directors' Report for 1919)

Membership Has Reached 10,000, and All Forms of Educational Activity Have Met With Success.



On the eve of our twentieth birthday, January 15th, 1920, it is interesting to recall one or two facts surrounding the Association's birth on January 15th, 1900.

The preliminary steps towards the formation of the Canadian Forestry Association were taken by Mr. E. Stewart, then Chief Inspector of Forestry and Timber for the Dominion (now of Toronto), who sent out a circular letter on January 8th, 1900, to a number of men interested in the subject of forestry, asking them to meet at his office on the 15th of that month. At that meeting were present: Sir Henri Joly de Lotbiniere; Mr. Saunders; Mr. William Little; Mr. Thos. Southworth, Director of Forestry for Ontario; Mr. E. Stewart; Prof. John Macoun, Assistant Director of the Geological Survey; Mr. Little was elected Chairman, and Mr. Stewart, Secretary.

On March 7th, 1901, the membership was 244 and the total receipts $192.45.

We have had in 1919 three chief campaigns to improve forest laws and administration, keeping in view always the sane balance that must be maintained between public regulations and the economic status of the wood-using industries.

In some parts of Canada, the absence of any real government machinery to carry out the public responsibility in forest conservation provided opportunities for constructive work along educational lines.

A good deal of time and effort have been expended upon Nova Scotia. The interest of the government in our proposals for the appointment of a Provincial Forester and the commencement of a Forest Service seemed to fluctuate considerably in the past two years, during which we have addressed ourselves to the situation in that province. This necessitated several brief campaigns to revive public pressure. Results, however, have recently been in evidence. The Provincial Government has offered the position of Provincial Forester to a well-qualified Canadian, and it is the Association's belief that this will lead to the reformation of Nova Scotia's fire protection system and the spread of forestry principles and practices amongst the Nova Scotia limit-holders who own the great bulk of the forest areas.

THE DOMINION CAMPAIGN

In the Dominion field the Association's effort to extend technical forestry supervision over the licensed timber berths in the three prairie provinces and the railway belt of British Columbia, as set forth in the last Directors' Report duly passed at the last annual meeting, met with strenuous opposition on the part of the Minister of the Interior, who finally suspended our annual grant from the Dominion Treasury. Every effort has been made towards securing a modification of the Minister's decision. It may be pointed out that the Association's attitude regarding the licensed timber berths on Dominion lands has been one of the cardinal points, not only in our own educational propaganda for many years past, but in the programme of the Commission of Conservation. We have asked only that the Department of the Interior apply forestry supervision to the timber berths within the reserve boundaries, just as it has for years with respect to the unlicensed lands within the reserves. The Association was governed wholly by considerations of public welfare and feels confident that its case will be overwhelmingly supported by the people of Western Canada who are most directly concerned, and whose interests are our primary consideration. It will be the Association's duty to continue to prosecute forestry propaganda in the Prairie Provinces to the utmost of its power.

The campaigns for reforms of forest administration in Ontario, Nova Scotia, and on Dominion lands, can be regarded, as in previous years, as the main task of the Association. The reform of the forest protection system of Ontario, the inauguration of a Forest Service in New Brunswick, the securing of fire legislation in the

prairie provinces, and other enterprises involving open agitation have well illustrated the potency of our educational propaganda, when focused upon special objects.

FOREST PROTECTION PROPAGANDA.

Educational work aimed at enlisting public co-operation in forest fire prevention was carried forward to the limit of the Association's purse. The Secretary gave a total of 40 lectures, with motion pictures, encountering large audiences whether in New Brunswick or the western provinces. A western series of meetings in October gained public support quite unprecedented in the Secretary's experience, large business organizations taking the meetings in charge and assuring excellent attendance. Newspaper co-operation in the Association's objects is everywhere unstinted and has proved of high value. In the western field particularly, Universities, Canadian Clubs, Rotary Clubs, and Normal schools provided the Association with many more invitations for addresses than could be filled. The attitude of prairie province business men towards conservation of their provincial forests and the development of tree planting in the southern areas has materially changed during the war period and constitutes a rich field for educational cultivation.

Mr. A. H. Beaubien was again engaged by the Association for French lectures in Quebec and covered 20 communities with almost unvaried success. Quantities of French literature and good motion pictures accompanied him.

By courtesy of the Dominion Forestry Branch, Mr. James R. Dickson was secured by us for a tour of Northern Ontario in charge of our Exhibition Car. Mr. Dickson spent three weeks in our service, together with a motion picture operator, visiting about twenty towns in regions where forest protection required stimulating. He was able to deliver nightly lectures with motion picture illustrations and was given a happy reception throughout.

Again, through the Dominion Forestry Branch we secured Mr. R. M. Watt, of Dauphin, Man., to take our Exhibition Car through the prairie provinces. Mr. Watt did sterling work and was indefatigable in his efforts to secure large attendances and interest the people. Thus at various periods of the year four lecturers have been working in the Association's campaigns. In New Brunswick, we were allowed the valued service of Mr. Kinghorn during the visits of our Car to the Fredericton and Chatham exhibitions.

THE RAILWAY EXHIBITION CAR.

Special attention is directed towards the Association's Railway Car which, as has been said, is a "forest protection school on wheels." With no alternative other than to secure exhibits by borrowing, some very attractive objects were brought together from many parts of the continent, including a complete display of all things made from pulp and paper for war purposes; a maple bush model; a model forest nursery; displays of wood distillates and wood samples; a ship model; entomological exhibits and wireless telegraph and telephones in operation, and a score of other objects, the whole assembled within the cleared space of a railway car with ornamentations of transparencies and flags. The car has been handed over to us temporarily by the Canadian National Railways, to which our hearty thanks are due. The car will start out again with improved equipment in May this year and, if our funds will allow, there would be an excellent opportunity in the western provinces for a second car arranged to emphasize especially tree planting in the southern prairies. The route taken by the car in 1919 included scores of small towns from Chatham, New Brunswick, to Calgary, Alberta.

Our custom of printing and distributing educational booklets for children and a variety of special issues aimed at such classes as settlers, was again followed with what seemed to be satisfactory results.

A number of large painted banners with fire prevention inscriptions were placed along railway lines. The Imperial Tobacco Company co-operated wtih us effectively by placing in cigarette packages warnings against carelessness with fire in the forest. Ten thousand menu cards in the dining cars of the main railway lines had our sermonettes on forest protection attached. We also had a fine response from lumber companies who were supplied by us with advertising copy as a substitute for their regular advertising in the newspapers. These are but representative of other publicity devices put into effect by the Association in 1919.

Articles for the newspapers and magazines have been supplied at frequent intervals and have been made use of freely. Our Travelling Lecture Sets, with slides and manuscript, proved once more an attractive educational medium.

IMPERIAL FORESTRY CONFERENCE.

Although somewhat outside the regular programme of our work, it may be pertinent to mention the move made by the Secretary of the Association to inaugurate an Imperial Forestry Conference having as its object a round-table discussion of the forestry problems and policies

of the various sections of the British Empire. This was designed to aid all foresters in public administrative positions and to inaugurate some method of permanent inter-communication between them. It was thought also that a logical development of such conferences would be the stimulation of inter-Imperial trade in forest products. Thus, it was suggested, there might come about a clearing-house of information on trade opportunities in timber and its manufactures that would prove of great advantage to Canada. The scheme was eagerly taken up by Scottish and English forestry authorities and gained the endorsation of the British Government's new Forestry Commission. Recently the Chairman of the Commission was authorized to call an Empire Forestry Conference for July, 1920, to take place at the same time as the Empire Timber Exhibit in London.

MEMBERSHIP.

The development of membership in the Canadian Forestry Association requires constant promotion work through every day of the year. There is practically no unsolicited accretion of strength and this is in keeping with the experience of nearly all other associations. The securing of members requires a very large volume of correspondence, quantities of special literature, and the use of local solicitors. The results for 1919 amounted to 3,000 new members, representing 37½ per cent increase in the one year, and 333 per cent increase since the commencement of the war period. We have now a healthy membership strength of 10,000 scattered over the entire Dominion. We have also members in India, Ceylon, Russia, Sweden, Denmark, South Africa, Australia, New Zealand, France, Spain, 250 in the United States, and a substantial body in the British Isles.

THE NEW MEMBERSHIP FEE.

In the correspondence of new members, abundant evidence is given that the responsibility of the state in administrating the forest resources has taken a strong hold upon popular thought. The Association has gained new adherents mainly by emphasizing the economic soundness of its policies, its detachment from all government and commercial bodies and the consistency of its objects with public welfare. We look forward to an even larger addition to the membership in 1920. It was decided by an almost unanimous vote of the Directors to establish an annual charge of one dollar for subscription to the Journal, in addition to the dollar membership fee. This is necessary in order to secure from the body of members not only the cost of printing the Forestry Journal, but a supplementary revenue for the general educational work of the Association.

The Canadian Forestry Journal, our official monthly, has proved a great factor in holding old members and gaining new ones. It has rendered an educational service to which many of our members bear a hearty tribute. Month by month, through text and illustration, the Journal spreads into all parts of Canada the Association's creed in forest protection and administration. We have made a special point of building up public interest in the economic magnitude of the wood-using industries of Canada and the need for the fullest public co-operation in maintaining their raw materials of standing timber.

The Forestry Journal hitherto has been prevented from developing its advertising patronage through lack of circulation. Having successfully passed the 10,000 mark, the Journal takes on new rank as an advertising medium, according to Canadian advertising experts consulted. We expect thereby to cut down the cost of the Journal's publication in 1920. The Secretary managed in December last to reduce the printing cost for 1920 by $800 over 1919, and by $1,300 over the best other tender we could obtain.

As to the collection of special subscriptions, the record for 1919 suggests how steadily the Association's educational work is gaining in favor of observant individuals and companies.

SPECIAL SUBSCRIPTIONS IN 1919.

Laurentide Co.	$400
Laurentian Forest Protective Association	100
Southern St. Lawrence Protective Association	100
H. N. Haberer	100
A. H. Campbell	50
Wayagamack Co.	25
W. C. Edwards & Co.	100
River Ouelle Pulp and Paper Co.	100
Riordon Pulp and Paper Co.	300
W. H. Johnson	100
Spanish River Pulp and Paper Mills	200
Abitibi Pulp and Paper Co.	200
J. R. Booth	200
H. H. Hettler	50
J. K. McDonald	25
Brown Corporation	200
N. B. Railway Co.	100
Colonial Lumber Co.	50
James McLaren Co.	200
Baie St. Paul Lumber Co.	50
Shevlin-Clarke Co.	200
H. A. Calvin	50
Bathurst Lumber Co.	200
Pembroke Lumber Co.	50

Ontario Paper Co.	200
C. Beck Manufacturing Co.	50
Bronson Co.	100
Graves, Bigwood & Co.	50
Port Arthur Pulp and Paper Co.	50
N. S. Steel and Coal Co.	100
Belgo-Canadian Pulp and Paper Co.	200
St. Maurice Forest Protective Association	100
North American Bent Chair Co.	25
Price Bros.	200
Northern Timber Co.	25
Beardmore & Co.	25
Randolph and Baker	10
Merchants Bank	100
Keewatin Lumber Co.	25
J. Kaufman	25
Canada Paper Co.	150
Fraser & Co.	75
Gillies Bros.	100
St. Maurice Paper Co.	100
International Nickel Co.	25
W. J. Bell	100
Stetson, Cutler & Co.	50
New Ontario Colonization Co.	25
Canada Western Lumber Co.	50
Fraser's, Limited	50
McLachlin Bros.	100
Brompton Pulp and Paper Co.	100
Nashwaak Pulp and Paper Co.	50
James Richardson Co.	50
Hon. N. Curry	100
M. J. O'Brien	100
Shives Lumber Co.	25
J. B. Snowball Co.	50
Mirimachi Lumber Co.	50
Estate of Wm. Hendrie	100
Haight & Dickson Lumber Co.	5
Howard Smith Paper Mills	100
Genoa Bay Lumber Co.	50
New Ontario Contracting Co.	50
Harold Kennedy	100
Standard Chemical Co.	100
F. D. J. Barnjum	100
Hope Lumber Co.	50
Excelsior Lumber Co.	25
Cushing Bros.	25
Nova Scotia Steel & Coal Co.	100
Imperial Bank	50
Royal Securities Corporation	200

73 contributors totalling	$6,840
Quebec firms contributed	$3,800
Ontario firms contributed	1,905
New Brunswick firms contributed	585
Nova Scotia firms contributed	400
British Columbia firms contributed	100
Alberta firms contributed	50

A further tabulation of special subscriptions gives this result:

Pulp and paper firms	$3,625
Lumber firms	2,415
Other donors	800

It is but fitting to convey our hearty thanks to the members of the Financial Committee who co-operated so splendidly with the Secretary. The commitee was composed of: W. E. Bigwood, W. G. Clarke, A. T. Cushing, Hon. A. C. Flummerfelt, W. E. Golding, I. H. Weldon, H. R. MacMillan, W. Gerard Power and Carl Riordon.

How widely based is the financial support of the Association appears from the 1919 list of donors. Our grants from special sources, independent of governments, have advanced as follows:

1916—the first year in which the Secretary sought special donations	$1,010.10
1917	2,235.00
1918	3,750.00
1919	6,840.00

OUR FINANCIAL GROWTH.

There is offered here an interesting comparison of our total revenues from all sources since the outbreak of the war:

1915	$5,279.23
1916	7,182.60
1917	11,192.16
1918	14,296.10
1919	20,067.70

Despite the entirely unexpected action of the Minister of the Interior in cutting off $1,000 of the 1919 grant in October, sufficient new money was quickly raised to give us a surplus at the end of the calendar year of $1,024.33.

It is obvious, however, that the Association is forced to travel on too slender financial resources. In the absence of any endowment or large government grants there is always the necessity of struggling to keep ahead of expenses. The mapping out of new fields of effort cannot be proceeded with in any satisfactory way unless means are devised of establishing the Association's income so that a programme may be drawn up for the entire year and not be subject to fluctuations in order to accord with the income probabilities.

The Directors wish to submit to the Annual Meeting the question whether the employment of an Assistant Secretary is advisable.

The Association may well consider also the establishment of a Resident Western Secretary as soon as the funds permit. The growth of the Association in the three prairie provinces has been unprecedented during 1919 and in such a city as Winnipeg, hitherto considered not the most promising field for membership develop-

ment in a forestry society, the number of members has increased from 300 to over 1,500 within the last six months. In discussing the project with many bodies of western business men in October last, it was impressed upon the Secretary that the appointment of a western propagandist, giving attention to the prairie provinces and British Columbia, would give new vitality to our enterprises beyond the Great Lakes.

Another project from which we are temporarily debarred by lack of financial support is the establishment of a Children's Lecturer, devoting his time entirely to propagandist work with Boy Scouts, school children, etc. The contact already established between our work and the growing generation demonstrates the remarkable attractiveness of the forest conservation idea to the child mind and the great possibilities of inculcating during the early stages sound ideals for the public administration of the natural resources.

ROBSON BLACK, *Secretary.*

DR. FERNOW ON THE TASK AHEAD

(A letter written by the Dean Emeritus of the Faculty of Forestry, Toronto, to the annual meeting of the Canadian Forestry Association at Quebec.)

Being by my physical condition prevented from attending your meeting, I accept gladly the invitation to express in writing some thoughts fit for the occasion.

In the first place, I want to congratulate you on the excellent progress which the Association has made under your guidance in spite of war conditions. Having myself been identified with the forestry movement on this continent for some forty years, nearly half that time as Secretary and as Chairman of the Executive Committee of the American Forestry Association, I know and appreciate fully the difficulties of introducing an economic reform in which the human element is lacking or at least indirect.

In this endeavor there are three phases of development to be recognized, namely: the formation of public opinion; the influencing of government activity; the providing of technical knowledge and ability. The growth of the Association testifies to the success of having secured large and influential public opinion on the necessity of forestry reform. A partial success has been attained in persuading the authorities that the abandonment of methods fit for the pioneering stages of national existence is necessary and are awaiting advice how to secure such reform. But the third phase of the development, the procuring of the means for providing such advice is largely deferred.

We have begun in earnest to eradicate the greatest enemy of our forests—the fire; at least we know how to combat it if the necessary funds are furnished. Forestry, however, is not accomplished by such protection against destruction. Forestry means reproduction, regeneration, reforestation—silviculture. Of this science we know but little that is applicable under our special conditions. Silviculture is based upon empiricism, experiment and experience in the woods, and, to secure such, time is required —a long time. In the forestry schools we can impart the fundamental basis for silvicultural practice and turn out men who may become foresters if opportunity is given them to experiment and gather experience in the woods.

Such experimentation—or research—to use a term now become popular—has been begun in a small way by the Commission of Conservation, the federal Forestry Branch, and a few private concerns. It should be taken up on a large scale by the Departments of Lands of the provinces and by the Dominion Branch, so that they may learn what conditions to prescribe for the logging of their limits with a view of securing reproduction.

This in my opinion, is now a most urgent matter and should form a part of the programme of the Association, the securing of adequate endowments and opportunities for educating foresters and gaining silvicultural experience.

Sincerely yours,

B. E. FERNOW,

SOUTHERN STATES DEMAND NEW FOREST METHODS

Canadians will be interested in this expression of the Southern Forestry Congress at New Orleans last month. The lumber industry of the Eastern States is now focused in the south, where the main body of eastern timber stands. The depletion of this timber by current methods of logging brought from the Congress of business men and foresters the following resolution:

FOREST DENUDATION.

Whereas, the supplies of softwood and hardwood timber in the Southern States are rapidly diminishing, with a consequent influence upon the price of lumber and other forest products.

Be it resolved, by the Southern Forestry Congress that it deplores the continuance of such practice of denudation and urges, in order that such practice may be avoided, the enactment of legislation by the Southern States that will require or make possible the adoption of measures by owners that will prevent such denudation and wil lafford an opportunity for a natural replacement of forest growth on lands not suited or not needed for agriculture or settlement; and, furthermore, the Southern Forestry Congress urges the States and the Federal Government jointly to co-operate liberally with owners in this direction.

SEED TREES.

Whereas, the south is approaching the end of its virgin timber supplies, and

Whereas, great necessity exists for retaining on cut-over lands enough seed-bearing trees to restock these lands; therefore

Be it resolved, that the Southern Forestry Congress urges all owners of forest lands in the south to pay particular attention to this matter which is of such vital concern to the south's welfare.

BOY SCOUTS TO GRADUATE AS "FOREST RANGERS"

Canadian Boy Scouts will be interested in a newly-launched organization in Chicago called the "Forest Rangers," which is intended to begin where the Boy Scouts leave off, and afford older boys a sort of post graduate course in woodcraft and the elements of forestry, at the same time instilling the wholesome principles of life for which the Boy Scout movement has always stood. The new organization is sponsored by Chief Forester Rance Kennicott, of the Cook County (Illinois) forest preserve. As in other juvenile organizations, there has been a tendency on the part of the older scouts to drop out at about the age of eighteen, or even younger, notwithstanding special tasks with corresponding honors, medals, etc., designed to interest and hold the older boys. The advent of the "long pants" age has to a large degree been the signal for getting out—simply gecause the 18-year old boy quite naturally regards himself as almost, if not quite, a man; and does not care to retain membership, unless as a scoutmaster or aid, in an organization that carries the word "boy" in its title, particularly as the bulk of its membership is made up of lads of from 12 to 16 years of age.

This objection seems to be effectively answered by the new organization, which its promoters believe will spread over the entire country and to foreign lands, just as tse Boy Scout movement which it is designed to supplement—not supplant—has done. Already the natty green caps which form part of the winter uniform of the rangers are, upon Saturdays and holidays, seen quite numerously in the Cook county forest preserve, where the boys, as Chief Forester Kennicott says, "are learning how to take care of themselves in the woods, and how to take care of the woods they are in." The age limits for admission to membership in the rangers are 15 to 21 years, and candidates are expected to "enlist" for a term of three years. The courses of study, and practice, will include woodcraft and elemental forestry, instruction in preventing and in fighting forest fires, camping, radio operation, etc.

WORKING PLANS FOR QUEBEC'S TREE CUTTING

Hon. Honore Mercier, Minister of Lands and Forests, in addressing the Canadian Lumbermen's Association at its annual banquet at Quebec, referred to fire protection and reforestation, dealing with constructive policies that should prove of undougted benefit. While he dealt primarily with conditions in Quebec, his words have a national application.

"Quebec has before it a vast colonization programme," said Hon. Mr. Mercier. "With a determination to understand each other's needs there is no reason why the lumbermen and the settlers should not get on perfectly well together. The lumbermen of St. Maurice have much for which to thank the settlers of Abitibi. With mutual forbearance and consideration, I feel there will not be much difficulty in deciding where the forests are to remain and where the land may be taken by settlers. A law was passed requiring settlers to take permits before burning to clear their lands. They have complied with this enactment and we have now a system of fire protection which is the envy of all the other provinces. The province has now to look to the development of its unsettled lands.

WILL MAKE COMPLETE SURVEY.

"Lumber has always meant much to Quebec, and the forests still remain one of the chief assets of the province. Our resources are great. We have 45,000,000 acres of timber lands under license, and approximately 75,000,000 of virgin timber lands. We do not, however, know the value of these forests, and we should like to make a complete survey of all forest land in order to build up a definite forest policy. For this we shall require the assistance of limit-holders so far as the survey of their limits is concerned; and the task of the Government in surveying the remaining territory will still be a vast one. In a word, the time has come for us to require the preparation of working plans in lumbering operations. You will admit that it is in the public interests as well as your own to plan your operations ahead, so as to leave the forest after cutting it in the best possible condition for future growth. The objection which may once have existed to such a policy has disappeared. With our well-organized fire protective system, due largely to your co-operation, the danger of fire has been greatly reduced and therefore you can afford not to cut the forest too close, in order that you can cut over again in a reasonable time.

ADVOCATES REFORESTATION.

"For the same reason private owners of waste lands may safely commence their reforestation. The Government intends to deal with lumber limits in a generous manner, but expects the limit-holders to do their share, too. The lumber industry in the past has done wonderful things to encourage the efficiency of mill operations and to reduce waste in the utilization of wood products. There is still much more to be done in this respect, notably in the use of hardwoods which have been practically untouched by present operations. I think we may rely upon lumbermen to devise proper and adequate methods of transportating these logs from the forest to the mill."

SCIENTIFIC INVESTIGATION SUPPORTED

"Whereas, it is manifestly to the interest of Canada as a whole, and of the wood-using industries in particular, that the fullest possible information be made available as to the character and extent of the forest resources of the Dominion, and as to the conditions which govern the reproduction and growth of the commercially valuable tree species;

"Resolved, tha t this meeting endorse the work along these lines already under way by the Commission of Conservation, with particular reference to the survey of the forest resources of the several provinces, in co-operation with the provincial governments, and the investigation of conditions of growth and reproduction of pulpwood species, in co-operation with pulp and paper companies, and the Dominion Forestry Branch and the Provincial Forestry Services, and recommend to the Dominion Government that financial provision be made for the continuation of these projects upon a more adequate scale."

(A resolution adopted at the meeting of the Woodlands Section, Canadian Pulp and Paper Association, Montreal.)

WAR ON FOREST INSECTS.

The Resolutions Committee further recommended:

First—That the Woodlands Section of the Canadian Pulp and Paper Association wish to place on record their deep appreciation of the commercial utility of the work of the Dominion Entomological Branch of the Department of Agriculture, particularly the Forest Insects section, under Dr. Swaine, which directly concerns our industry and recommend sufficient funds be provided in the estimates and placed at the disposal of this department to at least double the number of field parties in 1920.

Second—That in view of the large number of fires caused by coal-burning locomotives passing through our forest areas and the great losses resulting therefrom, that this meeting recommend that such railways be electrified where the water-falls in the forest areas are ample to supply the necessary power."

"LIGHT BURNING" CONDEMNED BY U. S. FOREST SERVICE.

By H. S. Graves, Chief Forester of the United States.

Light burning advocates assert that by firing pine forests every few years the woods will be kept clean and inflammable debris without injury to the merchantable stumpage, even without substantial injury to the young growth. The constant cleaning out of small stuff, underbrush and litter supposedly would thus protect the woods from serious conflagrations. It has even been claimed that pine forests protected by this system will no burn, and he whole thing is to be done at a cost of a fraction of a cent an acre.

BRUSH PATCHES ARE RESULT.

As a matter of fact it is precisely the repeated firing of the woods which has steadily eaten up the pine forests of California. Our national forests of that state contain close to two million acres of brush patches, which once were heavily timbered. Wiping out the forests on these areas in the national forests alone has cost the timber resources of California on the basis of average figures, around 37 billion feet of stumpage, and probably $75,000,000 in value at the present time. This loss is not the result of a few large conflagrations. Largely it has come about from one ground fire after another, extending over a total period of 50 or 100 years. Not only does each of these ground fires destroy much or all of the young growth; the butts of the old timber are eaten out, inch by inch. After every burning a few more of the old trees topple over in the wind. The ultimate result is a brush patch.

To me it is an absurd proposition that we can now go into the pine forests and fire large areas deliberately at a negligible cost per acre, which is one of the main claims of the advocates of the system, without continuing the same process of gradual but irresistible destruction. The light burning is supposed to be "controlled." In practice this control apparently amounts only to choosing the time of year when the woods are fired. The Forest Service has studied every area which it was able to learn about where intentional light burning has been practiced. Its effects have been substantially the same as those of the unintentional ground fire in the California pine forests. In every case at least a large part of the young growth is killed. In every case more or less injury has been done to old timber, except, where large trees have been protected by costly methods, such as raking debris from the butts or piling earth around them, methods so costly that the light burners have now abandoned them.

NO YOUNG GROWTH TO SPARE.

The Forest Service has no young growth to burn up. Neither has it any merchantable stumpage to sacrifice to a theory of protection which is essentially destructive. Hundreds of thousands of acres of national forest land in the western pine belt, which have been protected successfully for 12 or 15 years, now furnish a practical demonstration of what these forests can be made to produce under a genuine system of fire protection. Their brush patches are disappearing in thickets of pine saplings. The net growth per acre has been tremendously increased. The timber which the whole country will need when our virgin forests are depleted is now being produced. The Forest Service must oppose with the utmost vigor any system of protection which will wreck these growing forests or which will make it impossible to produce similar forests in the western pine belt generally.

INDEX FOR 1919

Chief Articles Published in Canadian Forestry Journal.

THESE MEN ARE INVESTORS IN CANADA'S FUTURE

By no means have all the members of the Canadian Forestry Association had an opportunity at the date of this issue, of taking a Contributing Membership for 1920 at a cost of five dollars. At the time of publication, February 11th, the following had accepted responsibility as Contributing Members. The gift of a few extra dollars over and above the normal membership fee, is a great help in carrying out the Association's programme. Without Government connections and with no commercial affiliation, the Forestry Association is forced to depend upon the good-will and enthusiasm of its members. To this we appeal in full confidence. It remains with the body of membership to decide whether we shall appoint a Resident Western Secretary and a Children's Lecturer, to carry the potent message of forest conservation to classes and localities not now within our reach.

Joseph Allison
Hon. G. E. Amyot
J. H .Ashdown
Abitibi Power & Paper Co.
W. G. M. Byers
Theo. A. Burrows
Hon. N. A. Belcourt
Frank K. Brown
Chas. Beck Mfg. Co.
J. B. Beveridge
H. L. Bradbury
Patrick Burns
W. A. Begg, K.C.
O. B. Brown
Walter A. Black
E. R. Bremner
John Beattie
Mark Bredin
George Boulter
W. G. Clarke
Hugh J. Chisholm
R. S. Cassels
J. H. Connor & Son
James G. Cane
R. J. Christie
Alfred Collyer
E. Coatsworth
Can. Land & Immigration Co.
A. E. Cross
L. Cushing
J. O. Cameron
James Cooper
J. A. Duthie
S. F. Duncan
H. R. Drummond
C. Draimin
H. A. Downs
E. M. Dechène
R. J. Dale
G. Durnford
C. E. Edmonds
F. J. Elliott
C. E. Friend
W .E. Fish
Thomas Fynes
Fassett Lumber Co.
Hon. Sydney Fisher
Mrs. R. C. Fisher
Sir Joseph Flavelle
John D. Flavelle
E. J. Freyseng
J. L. Goodhue & Co.
J. N. Greenshields, K.C.
C. S. Gzowski
Alex. B. Gordon
Peleg Howland
A. C. Hardy
Lieut.-Col. J. W. Harkom
R. K. Hope
C. H. Johnson & Sons, Limited
Keewatin Lumber Co.
Keenan Bros, Limited
Geo. M. Kelley
Louison Lumber Co.
O. Lefebvre
C. B. Lowndes
D. McLeod
Hon. Honoré Mercier
José A. Machado
E. W. Mudge
McAuliffe Davis Lumber Co.
Miss Alice McLennan
Sir W. R. Meredith
Miramichi Lumber Co.
Fraser Napier
Hugh Paton
John Penman
Price Brothers & Co.
T. M. Partridge Lumber Co.
Albert F. Park
C. E. L. Porteous
R. W. Reford
J. S. Russell
Senator E. D. Smith
Shives Lumber Company
R. Southam
Cecil Sutherland
Soper Lumber Co.
St. Maurice Paper Co.
Geo. H. Stacey
T. K. Smith
Hon. E .A. Smith
Angus Shaw
Stetson Cutler & Co.
Shevlin Clarke Co.
Nap. Thomas
A. St. L. Trigge
C. H. Waterous
W. J. Williamson
Mrs. H. D. Warren
F. C. Whitman
F. H. Wilson
T. Walklate
E. R. Wood
Robert B. Whiteside
Henrk K. Wicksteed
Cyril T. Young

QUESNEL RIVER—FALL ON NORTH FORK.
About two miles below Cariboo lake. Attempt to construct fish ladder seen on left.

CONDITIONS IN PRAIRIE PROVINCE FORESTS

By H. C. Wallin, Chief of Surveys, Dominion Forestry Branch.

We have examined in Manitoba altogether 46,272 square miles. This area covers the country from the settled districts northwards to about township 58, east of Lake Winnipeg, and to township 51 west of said lake and Lake Winnipegosis. It also includes the country adjacent to the Hudson's Bay Railway, and the Riding Mountain, Duck Mountain, and Porcupine No. 1 Forest Reserve. In the following estimate, these reserves and the country along the H. B. Railway are not included. The area to which the figures, I now give, refer is therefore 30,340 square miles. Of this 24 per cent is timbered (posts, poles, included)

36% recent burn or covered with young reproduction;
35% muskeg;
5% grassland, water or cultivated.

Of the timber, approximately 25,000,000 cords, about 30 per cent is poplar, 25 per cent jack pine, 25 per cent spruce, and the remaining 16 per cent is tamarack, birch and poplar.

IN SASKATCHEWAN.

In Saskatchewan the total area examined is 27,504 square miles, covering a tract reaching from the settled district northwards to about township 66. If we deduct the area of the forest reserves, with the exception of the Big River Reserve, we have an area of about 20,000 square miles, covering the country around Big River, Beaver River, Waterhen Lake, Dore Lake, Montreal Lake, Candle Lake, and Amish Lake. Of this—

41% is timbered;
18% is burn;
33% is muskeg, and
8% is grassland, water, etc.

The amount of timber per square mile is here greater than in Manitoba, no doubt due to the fact that a lesser area has been burned over in recent years. The total number of cords available is estimated to be between 40 and 50 million cords. Of this about 75 per cent is aspen and poplar, 13 per cent spruce, 10 per cent jack pine, and 2 per cent tamarack, birch and balsam.

ALBERTA'S FORESTS.

In Alberta, we have examined 63,000 square miles covering the Rocky Mountain Forest Reserve, the Grand Prairie and Clear Hills District, the Peace River Block, the country between the Athabasca River and Lesser Slave Lake, the Pembina Mountain, Lac la Biche, Christina Lake, and Cold Lake Districts, leaving out the Rocky Mountain Forest Reserve. This area occupies 41,371 square miles, of which

48% is timbered;
32% burn;
5% muskeg;
15% prairie.

The timber amounts to some 100 million cords, of which 40 per cent is poplar, 30 per cent spruce, 25 per cent jack pine and lodgepole pine ,and 5 per cent tamarack, balsam fir and birch.

From the above it follows that at present aspen is the predominating species in the district north of the prairies in the middle west. Spruce (and jack pine) which of course is commercially the more important species, lags considerably behind. The only practical way of reversing the situation is to keep the fires out until the forest has returned to the original type and wait for many years, except, perhaps, on limited areas on forest reserves where through a judicious system of cutting, or through planting, reproduction of spruce may be established at an earlier date.

TO REACH THE CHILDREN OF CANADA

The doors of ten thousand schools are now open to the interesting propaganda of the Canadian Forestry Association.

Invitations to carry on educational addresses with motion pictures are coming in in such numbers as make the Association's facilities conspicuously inadequate. Cape Breton, New Brunswick, Quebec, Ontario—indeed every section of the Dominion—offers us the opportunity to win the younger generation to an intelligent understanding of the forest resources and their protection from needless waste.

The cost of establishing and maintaining a proficient Children's Lecturer would be about $6,000 a year.

The consequences of his efforts in even one year could hardly be measured by a sum even one hundred times the annual outlay.

What member of the Association is willing to assume the first year's expenses of a Children's Lecturer working from Coast to Coast and to have his name identified with the benefaction?

What members of the Association are willing to aid, in any amount, this most promising enterprise?

The Secretary, Mr. Robson Black, 206 Booth Building, will be glad to enter into correspondence with members regarding this proposal.

A TYPICAL LETTER.

From the International Elevator Co., Winnipeg.

"We have pleasure in enclosing money order for $2.00.

"We appreciate the good work your Association is doing and the valuable information contained in the Journal, and we wish you continued success in your undertaking.

MORE LAND FOR MANITOBA.

Winnipeg.—Reclamation of 700,000 acres of fertile land in the Pas District will be carried out after the necessary legislation has been secured at the Manitoba Legislature, according to Hon. Edward Brown, Provincial Treasurer. The project will cost $2,000,000, and in addition to this $1 per acre must be paid to the Dominion Government. The land, which is situated in Northern Manitoba, close to the Saskatchewan border, will be worth $20 per acre. It lies in a triangle shape between the Saskatchewan river, the Carrot river, and the Sapanok channel.

IN PENNSYLVANIA.

Mining companies planted over 290,000 forest trees during 1919, all of which were distributed by the Pennsylvania Department of Forestry.

In Lackawanna county, seven tree planters set out 324,000 forest trees during 1919.

In the whole State of Pennsylvania 791 tree planters set out 3,139,631 forest trees during 1919.

A GUIDE TO ONTARIO TREE PLANTERS

By F. S. Newman, Manager of the Provincial Forest Nurseries, St. Williams, Ont.

The urgent necessity for extensive reforestation is evident when we observe the rapidity with which the productive forest area in Ontario is decreasing and the condition in which the greater part of the cut-over land is left. Heretofore when one region was exploited, and the timber removed, new areas of virgin forests were cut, leaving ever increasing tracts of waste land. In the southern part of the province, or "Old Ontario" there are frequent farm woodlots, which although providing wood products now, are not reproducing naturally. The time is fast approaching when these woodlots will be entirely cut down, hence it is apparent that future wood crops must be provided by means of reforestation.

MEANING OF REFORESTATION.

Reforestation means the growing of new forests. This may be attained by natural reproduction from "mother" trees, or by artificial restocking. The latter system has been found to be the most satisfactory, providing uniform stands of pure or mixed sorts as desired. Natural seeding is patchy, uncertain and incomplete. Abandoned farms and waste lands that have been allowed to run out, or that have been repeatedly lumbered and burned over, are more often lacking in sufficient seed trees, and consequently reproduction is possible only by means of artificial reproduction. This issue is attained by procuring forest seedlings with due regard to their suitability to the area or site on which they are to be planted.

CHOICE OF SPECIES.

Although the first factor in the choice of species is that those selected are sufficiently corelated to develop into a good stand, they must also conform to the particular object that the owner has in view when he makes the selection.

The two general objects that are usually entertained in establishing a plantation may be classified, viz:

(a) The production of wood or other forest products;

(b) The protection which a forest affords.

Where the choice is made with the object of producing fuel, posts, lumber, etc., in the greatest quantity in the shortest possible time, such species as birch and Carolina poplar form a rapid wood crop, which though of somewhat inferior quality, provides good summer wood and brings a fair price on the market. Black locust is without peer for posts and poles, making an exceptionally rapid growth and possessing excellent qualities as to durability. Where a timber crop is the object, White, Scotch, and Red Pines excel in lumber production.

TO MODERATE WINDS.

Trees grown for protective purposes should be effective in checking wind velocity, in preventing land slip on steep hill sides, in regulating water flow and in retarding soil erosion by both wind and water. Hemlocks, pines and spruces for mthe best windbreaks, while the deeper-rooted hickories and oaks excel in preventing land slip and erosion. The nature of the soil whereon the planting is to be done, must also be taken into consideration. Artificial regeneration may fail on account of the soil not meeting with the requirements of certain species. All trees grow better on deep, porous, moist, soil, rich in humus and mineral nutrients.

In many places although the soil is fertile, the ground surface is so steep and rough that farming thereon is impossible. On such places as these, walnut, white ash, cherry, beech and other exacting species might be advisably planted. On less exacting sites, that is on light sandy or gravelly soils, white pine, Scotch pine, red pine, red cedar and upland oaks should do well, while the shallow rooted species such as spruce, maple, elm, etc., are best suited to the heavier clay soils. A safe guide in choosing which species are best suited to the prospective area to be planted, is to observe stands of timber on adjacent woodlands, comparing the soil conditions and assessing the development in order to judge, whether or not, the trees are growing under favorable conditions.

WHERE SEEDLINGS ARE OBTAINED.

Careful attention having been given as to choice of species, the next step is to procure the seedlings. Upon applying to E. J. Zavitz, Provincial Forester for Ontario, Forestry Branch, 17 Queen's Park, Toronto, forest seedlings may be obtained from the provincial forest nurseries at St. Williams, Ont. These seedlings are packed and shipped early in May. They

are free, the only expense to the consignee being the transportation charges thereon.

PROCEDUURE WHEN PLANTING.

When the seedlings arrive they should be unpacked at once and "heeled in," on or near the area to be planted. By "healing in" we mean, that the seedlings are dipped in water, the roots placed in a trench, after which they are covered with earth which is firmly packed around the young trees by tramping and "heeling in." This excludes all air, thus preventing the roots from drying. If the area that is to be planted is grassy, remove about 1½ feet square of sod at the spot where each seedling is to be placed. This procedure entails a little extra labor and expense, but will pay in the end. Another quicker and cheaper method of planting where it is soddy may be applied by ploughing furrows at the required distance apart and planting the trees in the furrows. In many places, however, the removal of sod is unnecessary.

When actually planting, too great care cannot be taken. Two men form one planting gang. One man prepares the hole while the other carries the seedlings roots immersed in a pail of water. A V-shaped hole is made, in which the seedling is placed in an erect position. Particular pains should be taken to plant at the old depth and in tramping the earth firmly about the roots.

GRAZING TRESPASS PUNISHED.

The first case to establish the right of the Forestry Branch of the Department of the Interior to collect a penalty from ranchers grazing live stock on the forestry reserves, was tried in the Supreme Court at Macleod, Alberta, recently, and Mr. Justice Walsh decreed in favor of the Department of the Interior. John Nelson, of Meadow Creek, was the defendant, and he was fined $595 and costs. Witness fees totalled $390.

The decision was considered important in view of the fact that close to 50,000 head of cattle and horses graze within the forest reserves of Alberta. The Department charges eight cents a month per head for cattle, and ten cents per month for every horse .

The Manitoba Free Press: "Regarded both from the viewpoint of our own convenience and as a chief source of national wealth, the forests of the Dominion commend themselves to the particular care of the Canadian people. Their very magnitude may easily result in their destruction, or at least in a net reduction of their extent, which no amount of contortion and regret will avail to make good. A definite policy of conservation and replacement is required as a precautionary measure and to fulfill the duty of this generation as trustees for posterity."

"I want to congratulate you on the excellent progress the Association has made . . . . in spite of war conditions."—Dr. B. E. Fernow, Dean Emeritus, Faculty of Forestry, University of Toronto.

The nest of a red-tailed hawk, made of twigs, large enough to fill a tub. Photo taken on the Spruce Woods Forest Reserve, Manitoba.

TO EVERY MEMBER—A TIMELY WORD!

The Dominion Government grant, which has been paid to the Canadian Forestry Association for the past twelve years, has been suspended. In 1919 the amount provided in the Parliamentary Estimates for the Association was $4,000. Only a part of this was received and the Association has no notification that any further sums will be paid to it from the Dominion Treasury.

The Association appeals to its great body of members to modify the handicap placed upon its work through the loss of the Dominion grant by prompt payment of the annual fees.

Please bear in mind that your Membership in the Association is a vital force working towards a great national end. The subscription to the Illus trated Journal is just one feature of your relation to the Association. The two-dollar inclusive fee for 1920 pays for the higher publishing costs of the Journal and puts muscle into the widespread educational activities of the Association.

The Canadian Forestry Association is not identified with any Government or commercial interests. It is a Union of Ten Thousand Citizens.

BRITISH COLUMBIA'S FINE RECORD

The cost of fire-fighting during the 1919 season is placed at $153,000, to which is added the cost of patrol, trails, forest fire pumps, cars, launches, and fire-fighting tools, bringing the total for the year to approximately $330,000. When this is compared with the fire loss for the neighboring United States Forest District No. 1, with the destruction of three billion feet of green timber and a fire-fighting cost of $2,500,000, it will be seen that the British Columbia Forest Service emerged from a season of exceptional fire hazard with a comparatively small loss and not a little credit.

EXCEPTIONAL HAZARDS.

Special mention is made of the fact that the fire season of 1919 was one of exceptional hazard not only throughout British Columbia, but throughout the Dominion and the United States. Quite early in the fire season, the forest protection force was actively engaged in fire-fighting, the most serious situation being found in the southern interior.

AREA PATROLLED.

The actual area over which patrol is maintained is 124 million acres, divided into seven districts under district foresters. These are again divided into ranger districts, of which there are fifty in the province. During the close season, from May 1 to Oct. 1, an additional temporary force is employed. This force of assistant forest rangers acts under the local ranger. For certain districts, which have periods of intense fire risk, an additional force of patrolmen, employed for periods ranging from one month upwards, are put on to help in the work of fire prevention. Appointments to the ranger and assistant ranger positions are by examination; woods experience, fire fighting and general knowledge being taken into consideration. Practically every vacancy in these positions during the season 1919 was filled by a returned soldier.

PLENTY OF EQUIPMENT.

The report shows that modern fire fighting equipment has been tried out, notably the forest fire pump, which proved to be of great value to fire fighters during the past season. During the coming year, a far greater number of these pumps will be placed in the hands of the field force. These pumps will embody all the improvements suggested as a result of last year's trials.

GOING TO BUILD SCOTLAND'S FORESTS.
Portion of 600 sacks of Sitka Spruce cones on the dock at Port Clements, Queen Charlotte Islands, B.C. Collected for the Board of Agriculture for Scotland by the Dominion Forestry Branch, under direction of B. R. Morton.

REFORESTING SCOTLAND WITH CANADIAN SEEDS

In reply to a letter asking how well British Columbia seeds were doing in the Scottish reforestation operations, Col. W. S. Fotheringham, in charge, writes as follows:

"During the years 1918 and 1919, considerable quantities of seed of various coniferous species were specially collected in Canada under the direction of R. H. Campbell, of the Dominion Forestry Branch. In 1918, consignments of seed of white spruce, white pine, lowland fir and red cedar were received. The seed was distributed between two nurseries, one in the north-east of Scotland and the other in the west. Before being sown, the seed was tested at the seed testing station of the Scottish Board of Agriculture and showed satisfactory results in the case of white spruce and western red cedar. The lowland fir and white pine gave only poor results. The subsequent germination of the nursery beds confirmed these tests. A large number of seedlings of white spruce and western red cedar were obtained. The preparation and cleaning of the seed had been carefully done, as the tests for purity confirmed.

"In the year 1919, seeds were received of Douglas fir, Sitka spruce and birch. The germination and purity tests were again of a high order, and about 2½ million seedlings were obtained. In this case, a quantity of the Douglas fir seed was sown at Murthly, in Perthshire, and the number of seedlings obtained per pound of seed was much greater than that obtained in the northern nursery.

"The species of Canadian seed principally required are Douglas fir and Sitka spruce, and it is highly desirable that the localities in which these seeds are collected should conform as nearly as possible with the climatic conditions in which the trees are to be grown ultimately. A note regarding the climate conditions of the various districts in which seed is collected would be of considerable value in allocating the seed and subsequently the seedlings to districts in Scotland, such as east or west coasts, high or low elevations, and generally to place the trees under conditions of growth as similar as possible to that of their native habitat."

CONVENTION SPEECHES.

Men would rather hear one practical plan for doing one thing than the principles for doing a thousand.

Many a speech would never have been delivered if the speaker had first had some one read it to him.

People like a speaker who talks a little too long, just the same as they like a train that is a little too late.

Remember, your speech is not just twenty minutes long—it is twenty minutes multiplied by the number of people in the room.

—*American Lumberman.*

HOW FAST DO SPRUCE FORESTS GROW?

"If the pulp and paper mills of Canada can use 90 or 95 per cent of balsam in newsprint manufacture we have nothing much to worry about as to the future pulp wood supply of Eastern Canada," said Dr. C. D. Howe, at the meeting of the Woodlands Section of the Canadian Pulp and Paper Association at Montreal last month. Dr. Howe's interesting remark was brought out by questions from members of the audience as to the economic effect of the very slow reproduction of spruce on the cut-over lands of Central Quebec. Dr. Howe emphasized, however, that spruce must be produced to meet the demands for better grades of paper and for sawlogs.

As to the rate of growth of spruce trees on the sample plots established by the Commission of Conservation and the pulp and paper companies in Central Quebec, Dr. Howe said that he found the new spruce trees, coming in since the previous cut, showed a growth of one ince in diameter in forty years and two inches in sixty years.

THE FIRE EXPERIENCE OF QUEBEC ASSOCIATIONS

The months of May and June last year constituted one of the most hazardous seasons that has imperilled the forests in the St. Maurice Valley for many years. This put a special pressure upon the organization of the St. Maurice Forest Protective Association (Henry Sorgius, manager), but as usual, found this association equal to any emergency. Fifty-two per cent of the fires were traceable to the railway companies, chiefly the government-owned railways. President Robert F. Grant strongly recommends that more money should be expended for educational purposes.

Manager Sorgius reports that the fire losses in 1919 were the heaviest since 1915. The patrol force consisted of six inspectors, one sub-inspector, and 69 patrolmen. There were 169 forest fires, 48 per cent of the total area burned was cut-over land, 37 per cent in old burn, and 15 per cent in merchantable timber and young growth. Fifty-nine per cent of the damage done was caused by two fires set by locomotive and dam-keepers. The area burned amounted to 41,320 acres.

The Ottawa River Forest Protective Association, Mr. Arthur Graham, manager, covers 26,618 square miles of territory. In 1919 was encountered one of the worst fire seasons since 1914. The permanent patrol staff numbered 200 men, including 11 inspectors. In the eastern section, 4,717 acres were burned over, only 218 acres representing merchantable timber. In the western section 83,467 acres were burned over, of which 20,694 acres were under merchantable timber. These figures include both member and non-member areas.

The Laurentian Forest Protective Association utilized a staff of 67 men, covering an area of 11,163 square miles. There was a total of 69 fires as against 96 in 1918. The damage, however, was the heaviest since the association was formed, 58,037 acres being burned over. Mr. R. L. Seaborne, manager of the association, lays emphasis upon the carelessness of employees of the companies and fishermen in failing to extinguish fires during the dry season. He also stresses the urgent need of more intensive educational work.

The report of the Eastern Division of the Southern St. Lawrence Forest Protective Association, gives a total of 148 fires in 1919, burning over 1,590 acres. The total area patrolled was over 5,700,000 acres. Mr. J. D. Brule, manager of the eastern section, did most valuable work along publicity lines and managed to deliver 25 lectures during February and March, and do a great deal of other valuable educational work. In the western section, the manager, Mr. C. B. Guerin, reports 76 fires, which burned 1,726 acres. Mr. Guerin's territory covers over 3,400,000 acres. As with the other managers of the Forest Protective Association, Mr. Guerin is an enthusiast regarding educational work and has given every co-operation to the Canadian Forestry Associa tion, besides inaugurating special features of his own.

NEW OFFICERS WOODLANDS SECTION.

President, Brigadier-General J. B. White, D. S.O.; vice-president, S. H. DeCarteret; members of council, Frank Ritchie, Ellwood Wilson, and T. F. Kenny.

THE USES AND ABUSES OF AIRCRAFT

By Major K. E. Clayton-Kennedy.
(In an interview with the Canadian Forestry Journal)

"The flying man has an excusable and laudable desire to fly. If he is very junior he may desire publicity and plaudits and delight in being pictured as a 'hero birdman,' instead of realizing that an aeroplane pilot in commercial aviation is about as heroic as a taxi-driver. The 'hard-headed businessman' usually wants to accomplish certain objects, obtain information quickly, travel more expeditiously, etc.

"Unfortunately there have been several instances when the aforesaid hard-headed businessman has not applied ordinary business judgment and 'horse sense' to the schemes and proposals put forward by enthusiasts, for the combination of the theoretically romantic flying with some more prosaic business. A great majority of our returned flying officers are very young men of little business or organization experience. They went overseas, received intensive training for certain purposes, were given a machine, and detailed to do a certain job, which, in the majority of cases they did, to the entire satisfaction of all those against whom their efforts were not directed. If they brought the machine back so much the better. Mechanics took charge of it, and the flying officer did not usually think of it again until the next job of work came along. If he 'crashed,' he was told he was a careless lad, and to go and get another. Not three in a hundred knew the rudiments of maintenance, and practically none knew or cared anything of the costs thereof.

"So much may be attained by successful commercial aerial development, while the difficulties which admittedly exist and must be overcome are so great that immature attempts are apt to prove disastrous to the development of aviation. It must be realized that carrying out an aerial service involves skilled organization, and that the actual flying is really a very small part of the undertaking. To fly a machine intermittently is quite a simple matter, but to maintain a regular service is much more difficult, and involves a great deal of knowledge and executive ability quite aside from flying knowledge. Mapping from aid photographs is really a very highly technical undertaking, and the ordinary simple mosaic is not at all a true record and will not conform to an accurate survey unless it is carefully scaled and distortions corrected. The ordinary picture of this sort, shows all the topographical features in great detail, but there is no means of determining the exact scale, or the amount of distortions due to the camera not being truly vertical at the moment of exposure, except by the utilization of mechanical devices for measuring a tilt of the camera and its height at the moment of exposure, or by determining on the ground the correct positions of a sufficient number of points which can be identified on the photographs and deducting the scale and distortions of each photograph by comparing the relative positions of such fixed points as appear on it, with their true relative position as fixed on the ground. This involves the utilization of instruments of considerable precision in the hands of experts."

PRUSSIAN FORESTS AND THE REVOLUTION

The following from the Deutsche Forstzeitung, is of interest:

The social upheaval in Germany following the cessation of hostilities affected even the forests. For instance, on Jan. 11th, a party of about 50 people, armed with axes and saws, invaded the state forest in the Hanau district, and began to fell trees indiscriminately right in front of the forester's house. When he protested they drove him off with axes. Soldiers stationed nearby sided with the trespassers. A few days later another party of 50 or 60 men committed similar depredations on another part of the same forest, informing the forest officer that they were authorized to do so by the official appointed by the Soldiers' and Workers' Council of Hanau.

The forests near Nuremburg suffered even worse. Hundreds of men, women and children helped themselves to the timber, not only for their own use but to sell. Areas of 20 to 30 hectares were cut clean; even telephone and telegraph poles were cut and the wire carried away. From 60,000 to 70,000 marks' worth of wood was thus stolen from the Nuremberg crown forest each day.

IMPROVED WOODS METHODS FOR QUEBEC

Report of Committee on "Improved Logging Operations for Quebec," unanimously adopted at meeting of Woodlands Section at Montreal:

Your committee have the honor to report:

First—That the suggestion of having a committee to consult with the Hon. Minister of Lands and Forests, Quebec, is approved of, and we recommend that such committee shall consist of the members of the executive committee of the Province of Quebec Limit Holders' Association, to confer with the Minister on all matters relating to lands held under license from the Province of Quebec.

Second—That experiments be made in clean-burning at the option of the limit holder in conjunction with the Government Forest Service. The sample plots on which these experiments are made to remain a distinct forest reserve for a sufficient length of time to permit of the results being studied.

Third—Operating companies to forward applications for inspections which they wish made by the Forestry Service of their territories six months before beginning operations.

Fourth—In order to increase the output, all operators should utilize and remove all diseased, lodged, blown-down, or burnt trees and tops in their cutting areas, if of a commercial value to the operator.

Fifth—That the personnel of the Forestry Service be increased and larger cash appropriations be made.

Sixth—That operators be advised that there are forestry engineers ,graduates of the Quebec Forestry School, who might be available where their services are required.

Seventh—Any limit-holder wishing to reforest any part of the territory he holds under license to cut from the Province of Quebec shall furnish a plan showing location of tract to be reforested and a programme of reforesting; these same to be studied and reported on by the Forestry Service.

The Government to furnish the necessary stock free.

The limit-holder to plant the stock in co-operation with the Forestry Service.

The expenditure to be reimbursed by the Gov ernment, deducting the amount from the limit-holder's stumpage account for the current year.

The lands so reforested to continue to form part of the license.

CAN LUMBERMEN AFFORD TO BURN DEBRIS?

A forestry meeting that is certain to have an excellent effect was held at Montreal on January 28th, under the auspices of the Quebec Forest Protective Association. The attendance was excellent and the policy of having few formal papers and giving maximum time for general discussion proved most successful. The programme included the subjects of railway fire protection and slash disposal. An interesting paper, published elsewhere in this issue was read by Mr. Lyons of the Laurentide Company. Mr. J. D. Brule had also much interesting data derived from experiments in slash disposal on the limits of John Fenderson & Co., Sayabec, Que. The latter experiment lasted six days, three men being used to follow the logging crew. As trees were felled the limbs were piled and burned. Much difficulty was encountered in keeping the fires going. Mr. Brule based his figures of costs on a charge of $2 per day per man, and board at 75 cents per day per man. The stand contained 39 per cent spruce, 20 per cent fir, and 50 per cent cedar. The logging slash of 1,640 bd. feet was disposed of at a total cost of $4.42 per M. on one section. Other experiments showed a cost per M. of $3.20, $2.70, $2.50, $2.53, and for a solid cedar stand of $4.58, making an average of $3.32. For fir and spruce alone Mr. Brule gave an average cost of $2.73 per M.

COST HIGH FOR COMPANIES.

"Speaking of my section," said Mr. Brule, "lumbermen would have to increase from seven to ten the personnel of each logging crew if a clean burning of slash is to be obtained. At that rate it is certainly evident that operators will not attempt to do the work unless the Provincial Government is willing to meet them halfway in the expenditure."

As against the factor of increased cost, Mr. Brule believed that the chances for more generous reproduction of young trees were greatly increased. On an area of four to five acres he counted 297 young trees which were liberated through the piling and burning of slash. The destruction of natural nests for insect and fung-

ous infections was also accomplished by slash disposal.

THE WINDFALL MENACE.

Hon. W. R. Brown, of the Brown Corporation, expressed hismelf as unconvinced regarding the merits of top-lopping. After seven years he could discern very little beneficial effect in spruce operations.

Mr. J. A. Bothwell, President of the Canadian Pulp and Paper Association, stated that windfalls were responsible for more damage than logging slash. He thought that entomological work should take precedence to any plan for general slash disposal.

Mr. W. Gerard Power agreed with Mr. Bothwell, as to the great menace of windfalls in supplying fuel for fires. As concerns the River Ouelle Pulp and Lumber Company he was going to continue making experiments in slash disposal, and hoped in time to obtain some reliable data. Mr. Power said that he was absolutely in favor of clearing one hundred feet along the railways and a suitable distance adjacent to the main roads. His company had already done a good deal of slash burning along its roads.

Mr. R. P. Kernan, Chairman of the meeting, also emphasized the need of burning up debris along tote roads and main trails.

LOW COSTS IN PRAIRIE PROVINCES.

At the evening meeting of the Canadian Society of Forest Engineers, the question of disposal of logging debris was taken up by several foresters. Mr. Bristol, of the Delaware and Hudson Railway Company, told of the New York State law requiring lopping down to a three-inch top and regarded this regulation as materially reducing the fire hazard. Mr. E. H. Finlayson, District Inspector of Forest Reserves, Calgary, said that all sales by the Dominion Forestry Branch called for brush disposal. Some operations had shown a piling and burning cost of $1.85 per thousand board feet in stands where the crews were taking out to a diameter of five inches. Under more efficient methods the cost should not have been over $1.10 or $1.15 per thousand feet. In another large sale for railway tie purposes the cost reckoned up was 3 cents per tie.

Mr. C. MacFayden, District Inspector of Forest Reserves at Prince Albert, told the meeting that in Dominion Forestry Branch sales in Sas-

katchewan brush disposal was now taken as a matter of fact and Saskatchewan men were competing successfully with outsiders who were free from such restrictions. He gave an instance where on cordwood operations the brush disposal costs were 75 cents per cord.

PENNSYLVANIA'S TREE PLANTING.

Almost fifty million forest trees have been raised in the nurseries operated by the Pennsylvania Department of Forestry.

More than 34 million trees have been planted on the state forests during the last twenty years.

The water companies of Pennsylvania have received 1,730,000 forest trees for planting purposes from the Pennsylvania Department of Forestry during the last five years. They planted 599,275 tres in 1919.

In Union county, Pennsylvania, 58 tree planted 599,275 trees in 1919.

A PROGRESSIVE SUBSCRIBER.

Parry Sound, Ont.

"Enclosed please find my cheque to cover subscription for our eight camp foremen at Pakesley, and my own here. The foremen take a keen interest in the Journal, and I believe it will have a good effect on them regarding the care of fires in the bush during dry seasons. Also enclose cheque for $5.00 Contributing Fee. Wishing you every success in this work, I remain, yours truly,

"JAMES LUDGATE."

FROM REGINA, SASK.

"The breezy forcefulness of the 'Journal' indicate, to my mind, powers of initiative and originality, which should push your campaigns along rapidly.

"More strength to your arm.

"I take much pleasure in enclosing the fee of $5 to cover a 'Contributing Membership'."

WASTE PAPER AS A TREE SAVER.

(American Lumberman)

It is true, of course, that the demands for paper are now rather heavily crowding the present available capacity of present plants. There are, however, plenty of sites for paper mills within easy reach of many years' future supply. Our use of present paper supplies is also of the most wasteful sort imaginable. No rational effort has ever been made to gather up the once used paper and remanufacture it. The process is entirely practicable and economical, but the trouble is that the "dear public" is expected to gather up and tender the old newspapers as its contribution to conservation, without any adequate financial recompense. The price of 30 cents a hundred pounds for newspapers folded and bundled, offered by the man in the alley with the ramshackle wagon, dejected-looking horse and suspicious spring scales, represents $6 a ton, of which at least $1 is absorbed in the actual cost of gathering, folding and bunlding the papers. That leaves $5 a ton, and the fuel value of such newspapers is more than that if they are used in the furnace, especially for a quick fire in warming up the house on a cold morning. Why should the public save its old papers under such circumstances?

WHAT IT COSTS TO CLEAN UP A FOREST

The following interesting statements regarding the results of experiments in piling and burning the debris of logging operations on the Laurentide Company's limits, was presented at the Montreal Forestry Convention by Robert W. Lyons, B.Sc.F.

The following was carried out while making experimental cuttings in a balsam-spruce type, balsam forming 64 per cent of the stand. This area was cut over for white pine some years ago. Strips from one chain wide to three chains wide and fifty chains long were cut clean, and all logs were taken down to three inches top diameter. The slash on each alternate cut strip was burned.

Therefore, as a safe and economical method to dispose of slash, piling and burning as logging progresses, was employed as a practical remedy. The object was to burn the brush prior to the removal of logs. The plan followed promised to be feasible. It is, in brief, working two cutting crews together with two additional men for burning the brush. These men take the branches as they are cut and place them on the fire. These fires were usually placed to save reproduction and in a place suitable to the felling. The cutting crews were instructed to bunch the tops close to the fires, a 20-foot radius being the limit. If the branches should be wet, or after a fall of snow, the fire was usually started before the work commenced for the day. It took from three to five minutes to make, and two minutes more elapsed before branches could be thrown upon it steadily. However, if the branches were dry, the custom was to pile the debris into round compact piles, all the large ends lying in one direction, set fire to it and then continue piling on the slash. This relieved the men from facing a hot fire while the branches close to it were being piled. These piles could be started by the smallest blaze, and in a country of white birch, the time spent in making fires was practically eliminated. Therefore, thirty to forty minutes were saved daily. It might be noted, also, that in piling the

(Continued on page 92)

Northern Electric

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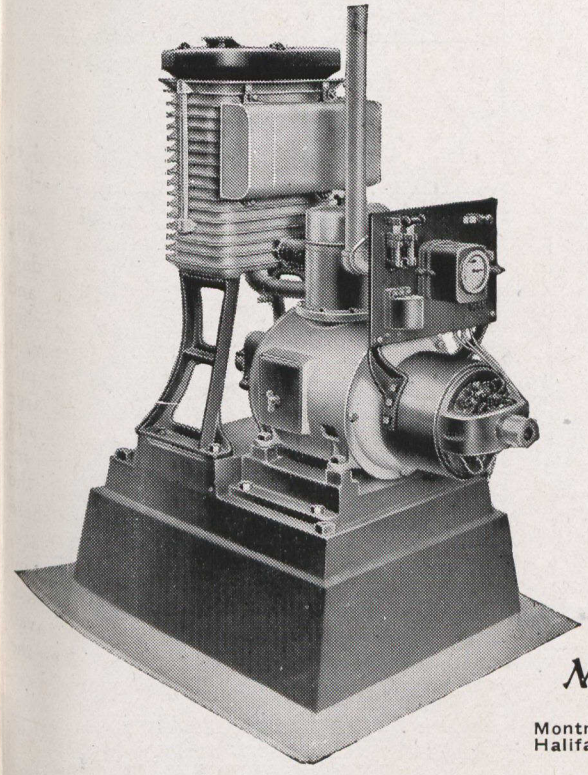

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Especially adapted to camps—saw-mills—construction work—stores—farms and all country houses.

This cut shows the Utility model ¾ K.W. usually furnished wtih storage battery, but obtainable as a one-piece generating unit.

Its features include: Bosch Magneto—S.K.F. Ball Bearings—Electric Governor—and concealed Flywheel—it is self-cranking and stops itself when battery is charged.

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CITIZENSHIP AT WORK!

A Short Statement on the National Purpose Behind the Canadian Forestry Association.

The Canadian Forestry Association is a co-operative union of ten thousand Canadians who believe that the care of the public-owned forest resources is a first duty of their Citizenship.

Of all the resources, the forests are the most easily destructible. Lands, mines, fisheries, water-powers—mighty factors in the national machine—are subject to abuse and deterioration, but none is so exposed to rapid destruction as the forest.

Two-thirds of Canada's forests already have been destroyed by forest fires.

The story of purposeless devastation has applied uniformly from Coast to Coast.

Changing conditions only add to the enormity of timber destruction. As the forest areas decrease, the world's demand for the thousand-and-one products of the forest intensifies. Consider one forest product—the modern newspaper! Forty million newspapers are whirled from the presses of the United States and Canada every working day. A blank newspaper is but a flattened log.

America has to have for her newspapers every twelve months, a pile of spruce logs four feet high and nearly 9,000 miles long.

Small wonder that the industries and Governments have decided to face the question of impending forest "exhaustion" and find a remedy in fire prevention and sane forest management.

Canada is a country of public-owned forest lands. Fully nine-tenths of all the forest lands of the country are in possession of the state. The protection and management of these forest properties so as to keep the great resource self-perpetuating for all time to come is a long-time enterprise. It involves policies extending far beyond the "life expectancy" of any individual and most corporations. For such peculiar reasons, Forest Conservation is primarily a state responsibility devolving upon the whole of the people. The chief burden of forest depreciation and the greater part of the dividends of good handling are assumed by the Canadian people.

YOUR SERVICE TO CANADA.

Then, why the Canadian Forestry Association?

Because in democratic countries, legislation seldom runs in advance of public opinion. There must first be an informed public before there will be genuine forest protection. The Canadian Forestry Association takes upon itself that educational task.

"But," the reader may say, "I am not benefiting by this propaganda—not personally." Neither does the great bulk of our ten thousand members. Forest Conservation is but your synonym for alert citizenship. It is not primarily a technical or trade matter. It is national welfare.

THE MAN WHO SETS FIRES.

"Does the Association reach the man who actually causes the forest fires?"

"That is a question everyone is interested in. We have our lecturers working in various sections of Canada. They use motion pictures freely. We have what are called "Travelling Lecture Sets" for use in the schools and churches. Then our Railway Exhibition Car, a sort of "Forestry School on Wheels," it has gone into most of the provinces with its unique display and daily lectures.

We prepare and distribute free booklets, well-pictured, to tens of thousands of young people. We issue special editions of attractive literature to settlers, railroad men, etc. Maybe you have encountered our sermonettes in a cigarette package, or attached to the menu cards of a dining car! They have been used by thousands in such ways.

We place large fire-warning banners at some of the railway junctions, and no doubt you have read numerous of our newspaper and magazine articles sent out by our Publicity Bureau. Then, too, we get a great many business concerns to substitute our fire prevention advertisements for their regular ads in the papers.

"Why not allow the Governments to undertake this work?"

"Eventually they may, but mainly as a consequence of the Canadian Forestry Association's twenty years of propaganda. For the present, much of the Association's effort is expended in persuading some Governments to institute

proper forestry policies. Without the driving force of such concentrated public sentiment, many of the sound and practical laws and improved administration in our Canadian provinces would to-day be lacking.

These are but a few of the methods we use to win the Canadian people to careful guardianship of their forest resources.

FOR 1920 WE WANT

To establish a Resident Secretary in the Prairie Provinces to develop a tree-planting campaign and arouse interest in forest fire prevention.

To establish a Children's Lecturer, working exclusively with young folks in all parts of Canada, and having the aid of motion pictures in all his public meetings.

To intensify all our campaigns of education.

IT DEPENDS UPON YOU.

We have no identity with any Government or commercial body. Every dollar received is a voluntary contribution. The prompt payment of the annual fee is the very best method of keeping our constructive propaganda active.

"We recognize the extremely good work done by the Association, and have pleasure in enclosing our cheque for $50 towards carrying out your programme."—Jas. Richardson Co., Matane, P.Q.

TORONTO FORESTERS AT BANQUET.

Addresses covering a wide range of forestry subjects were delivered at the fifth annual banquet of the Foresters' Club, Faculty of Forestry, University of Toronto, at the Carls-Rite Hotel, February 7th. A. W. Beatty, president of the club, presided, and addresses were given by D. R. Campbell, E. J. Zavitz and E. H. Finlayson. The guests of honor present were: Clyde Leavitt, Chief Forester, Commission of Conservation, Ottawa; D. R. Cameron, Dominion Forestry Branch, District Inspector for British Columbia; Charles MacFayden, Dominion Forestry Branch, District Inspector for Saskatchewan; E. H. Finlayson, District Inspector for Alberta and E. J. Zavitz, Provincial Forester for Ontario.

SEEDING IN FURROWS VS. PLANTING

Hegemeister Streck, of the German Forestry Service, in a magazine article, asserts that regeneration of clear-cut areas can be done fully as successfuly by seeding as by planting. He has used a system of strip seeding with excellent results both as to germination and as to survival through dry years such as 1911, 1915, 1917, and 1918. In 1911 and in 1918 the spring droughts were so severe as to kill even ten-year-old pines, while the one to four year old plants in the seeded strips all survived. The 1918 seeding which covered 23 hectares was a complete success. He cleans off the raw humus from strips 50 cm. wide, spaced 1.5 meters apart, and in the middle of the strip makes a furrow 10 cm. wide and of the same depth. This is done in the fall, and early the next spring the seed is sowed in the furrows and covered. Emphasis is laid on the need for carefully removing all of the raw humus, and for sowing the seed early so as to take advantage of the winter moisture.

WHAT IT COSTS TO CLEAN UP A FOREST

(Continued from page 86)

big ends in one direction everything is burned, and allows the burners to proceed with the fellers. There are two main difficulties in this way:

1. The opposition of the men doing the work, even though desired by their superiors.

2. The present system of placing the men.

These are more serious problems than would be supposed. Good men are scarce, and they object to the heat and sparks from the fires. Therefore, the poorer workers drift into a job they cannot handle properly. However, this can be overcome by piece-work, with a bonus and proper supervision.

Cost. This cost has been obtained from the time reported as work done by the men on the job. However, the costs were kept separately for each strip ,therefore we have been able to obtain also a comparative cost on same. For obtaining the number of cords, the logs were measured at the mid-diameter, 4,000 logs on the burned area being measured, and the result used as a converting figure. The Quebec rule was used in obtaining the board measure.

The following has been compiled from the actual time recorded against the operation. A daily time sheet shows for the whole operation:

Before the brush was burned on one of the Laurentide Company's experimental strips.

40 man days at $3.10	$124.00
2 man days at 2.70	5.40
1 man day at 2.50	2.50
Board at $1.25 per day	53.74
	$185.64

They have burned 15 acres on which there were 172.1 cords of wood, or 84,775 B.M. Therefore, the cost per cord is $1.07, and the cost per M., $2.18.

Mr. Lyons' figures further showed that on one strip of five acres, felling and limbing cost $2.94 per cord, with 89 cents per cord additional for piling and burning. A second strip of five acres showed a cost of $1.11 per cord for brush disposal.

As to the time check kept on the operation, Mr. Lyons stated that the periods accounted for included the time spent in actually piling and burning the brush. It was found that it took one man one hour to pile the brush from seven trees averaging 8 inches stump diameter. Therefore, in measuring the same, computing into cords and at the wages paid, the result was 87 cents per cord.

B.C.'S CUT FOR 1919.

Victoria, B.C.—The total log scale for the province for the year 1919 is 1,758,329,995 feet, as compared with 1,761,184,406 feet in 1918, according to a statement issued by Hon. T. D. Pattullo, Minister of Lands.

COMING B. C. LEGISLATION.

"It is also foreshadowed that a measure will be brought down looking to the conservation in perpetuity of the timber of the province, and the Legislature will be asked to grant a special appropriation in this connection. Irrigation conditions in the dry belt will again be considered with the object of providing for a more thorough system of protection to the water service generally in the districts affected. In this respect the minister of lands will introduce a comprehensive proposal for the consideration of the House."

—*Vancouver Province.*

BARK BEETLE MENACE AT COAST.

War has been declared by the B.C. Forest Branch on the pine beetle which for years has been carying on its destructive work in certain sections of the interior of the province.

Mr. Ralph Hopping, an entomologist, who has had wide experience in fighting the pine beetle on both sides of the international boundary, has been loaned by the Entomological Branch of the Department of the Interior at Ottawa. He is now on the ground directing operations for the curtailment of the energies of the beetle, and, it is hoped, for its ultimate control.

B. C.'S STAFF REORGANIZED.

The British Columbia Forest Branch has recently undergone a complete rearrangement of its administrative organization, which will enable it to handle its large volume of work more adequately, and render better service to the public, than ever before. The return of the great bulk of its technically trained forestry staff fro moverseas service, coupled with the acquisition of some new men, has rendered this progressive action possible.

In recognition of valuable services rendered, as well as of increased living costs ,the salary scales have also ben revised upward in a way that will set the standard for other governmental forestry organizations throughout Canada.

One of the features of the administrative reorganization is the establishment of an office of investigations, whose duty it will be to conduct studies and researches into the various problems connected with the administration of Provincial Crown timber lands. This will include growth studies, volume studies, regeneration surveys, methods and costs of slash disposal, etc.

The Forest Branch has full charge of all phases of Crown timber land administration, including not only fire protection, but the enforcement of timber regulations, scaling, collection of forest revenue, grazing and the development of domestic and foreign trade in British Columbia timber. The forest revenue to the province aggregates upwards of $2,700,000 per year and is now to be further materially increased, due to the enhanced selling price of lumber, upon the basis of which stumpage prices for timber cut on Crown lands will be increased, in accordance with the Forest Act.

CLYDE LEAVITT.