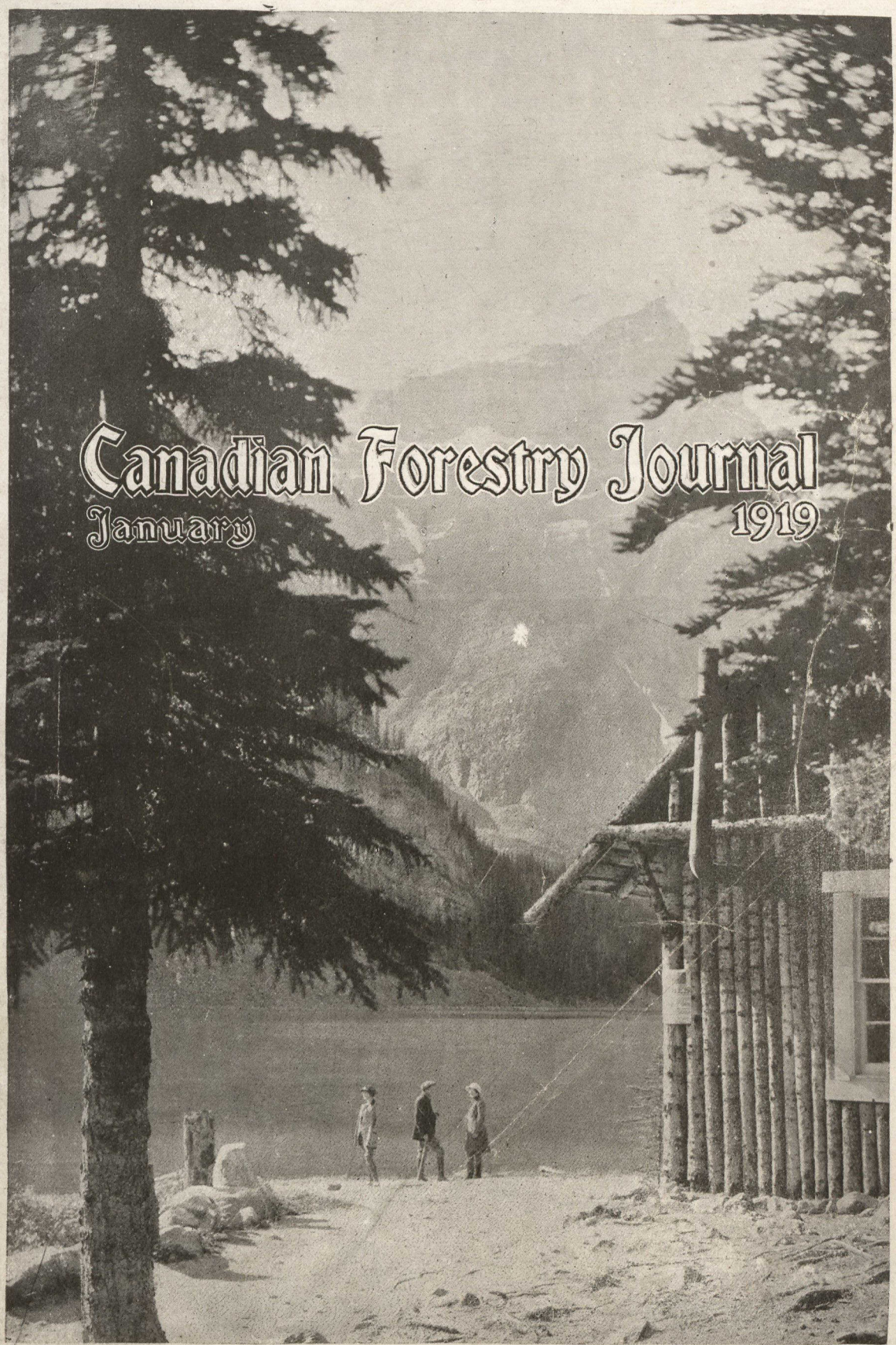

Canadian Forestry Journal
January
1919

Canadian Forestry Journal

VOL. XIV. JANUARY, 1919 No. 1

RECONSTRUCTION IS A CONSERVATION QUESTION

By Gifford Pinchot, Former Chief Forester of the United States.

December 9, 1918.

How can we make use of the earth in order to make its forests and waters, lands and minerals, more available for the service of humanity than ever before—more effective toward the greatest good to the greatest number for the longest time?

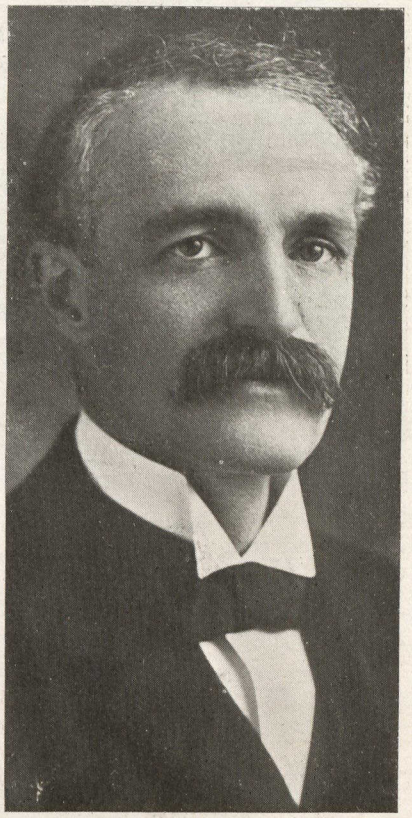
That is the fundamental question in reconstruction. The second question is, How shall the benefits from the use of the earth be distributed so that more people will be prosperous and happy than ever before?

Reconstruction is a conservation question, and can not be handled successfully unless the conservation point of view is fully kept in mind.

In many ways the forest is the fundamental natural resource, for it not only supplies a basic raw material of modern civilization, but makes it possible for us to get and use the other raw materials which it does not itself supply. Without wood, men have not advanced beyond the Esquimaux stage. Reconstruction can not be successfully handled by neglecting the forests.

You in Canada are more fortunate than we in the United States in having begun to save your forests before destruction had advanced to the point it had in ours. You have begun to prepare your plans for reconstruction earlier also. I venture to express the earnest hope that in planning for the new, greater, and more glorious Canada which we rejoice to see emerging from the War, you will keep in the forefront of your minds the FOREST, mother of men and source of prosperity, and that you will build firmly for your immeasurable future in forestry, and in all other branches of the great problem of reconstruction.

GIFFORD PINCHOT.



MR. GIFFORD PINCHOT
formerly Chief Forester of the United States, and one of the dynamic figures in the forest conservation movement on this continent.

The planted approach to the C.P.R. Irrigation Offices.

No more 'bald prairie' for this man! A thriving plantation of Spruce and Manitoba Maple at the Watermaster's headquarters, Crowfoot, Alberta.

PLANTING UP THE IRRIGATION BLOCK

A Simple Scheme to Offset the "Move-on" Instinct of the Prairie Farmer in the Treeless Home.

A far-seeing scheme of tree planting has been put into effect by the Department of Natural Resources of the Canadian Pacific Railway Compaiy on the irrigation block east of Calgary. Naturally devoid of any tree growth and yet with great potentialities in agricultural production under the stimulus of an irrigation system, it was early realized by the management that no matter how fine the building that may be put up on the bald prairie, it can never be a real home unless there are some trees and shrubs upon the ground. Most of the settlers coming to the irrigated lands had their origin in well treed districts and all of their old associations are very intimately connected with the trees growing about their old homesteads and the leaf-shaded lanes through which they played as children. The aesthetic side of prairie farming is coming to be recognized as having vast practical importance. For example, if a settler can be induced to become interested in the appearance of his farm, particularly to the point where he will plant a grove of trees, it is reasonably certain that, unlike many prairie farmers, he will soon have something more than a transient business interest in the property. Once that attitude is developed it is but logical to assume that the settler will not start out to "mine" the soil with the object of getting as much quick money as possible and then selling out. The Canadian Pacific Raiway Company has done a splendid service in encouraging planting of trees around the homes on the irrigation block and has distributed each year, without charge, quantities of trees which have been found by experiment to be hardy in the district. Mr. R. D. Prettie is the Company's Superintendent of Forestry at Calgary.

MAPLE SUGAR OPPORTUNITIES.

One of the opportunities open to Canadians is the development of the maple sugar industry, according to a bulletin on the subject of maple sugar issued by the Department of Agriculture.

The production of maple sugar and syrup should have increased with the increasing market for luxuries, but have not done so, the bulletin points out. The yearly production of maple sugar, together with its equivalent in syrup, has fallen from more than 22,000 pounds in the eighties of the past century, to about 20,000 pounds during recent seasons.

THE ASSOCIATION'S MAIL BAG.

"We are in hearty sympathy with the objects of the Forestry Association, particularly with the educational work it is doing."

D. M. McDOUGALL, President,
Nova Scotia Steel & Coal Co.

"We cannot speak too highly of the effort you are making towards the safeguarding of Canadian forests from fire."

NICOLA PINE MILLS Limited,
Canford Mills, B.C.

RESULTS OF EDUCATION.

CANADIAN PULP AND PAPER ASSOCIATION.

Windsor, Que., Dec. 10, 1918.

Canadian Forestry Association,
Ottawa, Ont.

Dear Sirs:

I notice with great interest among the people throughout the country a gradual awakening to the seriousness of loss from bush fires. So much of this is due to the constant effort of your Association that it is with great pleasure I extend congratulations

Yours truly,

(Sgd.) F. J. CAMPBPELL,
President, Canadian Pulp &
Paper Association.

BUILDING UP NEW TRADE MEANS BUILDING UP NEW FORESTS!

By Rt. Hon. Sir George E. Foster, K.C.M.G.,
Minister of Trade and Commerce.

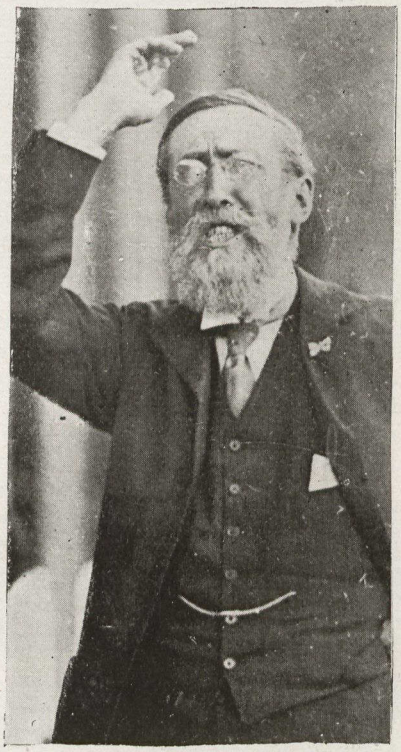
A Call to National Action in the Interests of Canada's Future Population.

Editor, "Canadian Forestry Journal."

My deep interest in the subject prompts me to send you this brief reply to your two questions:

1. What in my view is the position assured to Canadian forest products in future export markets?

In respect to this the situation is obvoius. For nearly four years and a half the most destructive war of the ages has raged over a great part of the world on land, on sea and in the air. It has been a war of tremendous equipments and of most destructive appliances in offence and defence. For this equipment in ships, airplanes, bridges, trench housing and packing construction, the call upon forest resources has been almost incalculable. This call has not been satisfied from the usual timber resources, but has been made with peculiar insistence upon private and public timber areas hitherto little cut, which constituted as it were, great growing reserves for future use. In this way the standing and preserved areas in Great Britain, France, Belgium and Central Europe have been sadly depleted. This, however, is only one side of the picture.



A World of Bare Shelves.

Whilst this severe and pitiless requisition on standing timber was benig made, forces of destruction by virtue of and armed by this very supply were incessantly at work sinking, burning, and battering to atoms structures of all conceivable kinds in which wood formed the material in whole or in part. So that here we have had the merry race of devastation feverishly employing the living material in order through its destruction to destroy the vast accumulation of dead and built in material. It needs but a moment's thought to conceive the effect of this double orgy of destruction upon the world's forest resources. But it will tatx the capacity of the best statisticians to display the incalculable loss.

Now when peace comes, the world's shelves are bare, the world's resources are diminished and the world's needs are greater than ever. The deduction is plain.

Canada which possesses large forest resources will be imperatively called upon to contribute to the reconstruction necessities of the devastated portions of Europe.

Organisation, intelligent and economic methods of production and financial credits wlil do the rest. Are our Captains of Lumber ready? If not, it is time they were "up and doing."

2. Your second question as to the importance of Forest Conservation is, if anything, the more serious of the two.

When Canada has 25 Millions!

It is so easy to make sweeping generalizations from insufficient data and lack of careful information. So especially have we been led into error, I hope not fatal, in respect to the immensity of our Canadian timber resources. Are they inexhaustible? We have too long gone on practically upon this assumption and the assumption all along has been a false one. And so we have cut and slashed, culled the choice and burned or bunched the rest to dry for kindling new forest fires, and suffered tremendous destruction by both wasteful cutting methods and by preventable fire waste, until to-day those who think and know are pessimistic as to our available supplies of merchantable timber. And in reafforestation we have done nothing.

Canada has 8,000,000 people, who have so far enjoyed easy facilities for lumber supplies. But when Canada has 25,000,000 people with their wants, which will certainly not be less than ours of this generation, what will be the sources of supply?

We must provide for our own needs here and now; we must furnish in part from our comparative abundance what our devastated allied countries need to reconstruct and we must, as trustees of the future, keep sufficient for our growing nation.

Must Improve Our Methods.

The argument need be pressed no further. The conclusions seem obvious. Canada must supervise and improve her methods of cutting and very possibly limit the yearly cut in the interests of future generations. Canada must protect her forests from fire by the wise expenditure of money in guarding and supervision. Canada must set herself diligently to the task of afforestation.

If these conclusions are just, can we not all get together, Governments, municipalities, timber owners, and all thoughtful units of citizenship, to conserve and perpetuate so indispensable and valuable an asset of the nation?

Yours sincerely,

GEORGE E. FOSTER.

Ottawa, Nov. 8, 1918.

CANADIAN LUMBERJACKS WIN.

Novel features were introduced when forestry troops from Canada, Australia, New Zealand and Great Britain held an athletic and field day "somewhere in France." There were 17 companies represented, 12 of whom were from one district group of the Canadian Foserty Corps. There were contests in cross-cut sawing, log loading, tree felling and log rolling, on land and in water. The Canadians won four of these five contests.

In the cross-cut sawing two experienced lumberjacks, who formerly worked in the neighborhood of the Ottawa River, finished the job in thirty seconds. The second and third prizes were won by men from two other Canadian companies. Speed and neatness were the qualifications required in the log loading. Three Canadian units were winners, the first doing the job in five minutes, twenty seconds.

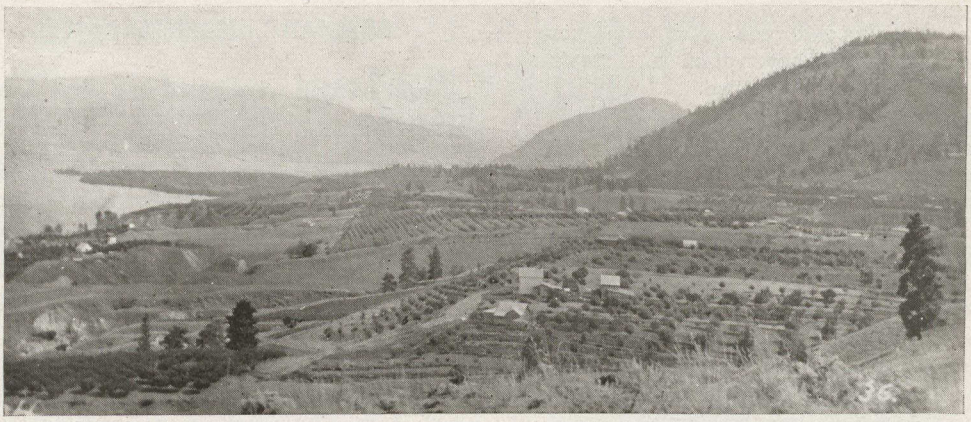
A French-Canadian won the log rolling in water easily. He was an experienced river driver from lower Quebec, for he quickly put most of his opponents off the logs into the water. The second prize winner was a British Columbian. Three Canadians won the log rolling on land.

The director of timber operations in France gave a cup to the company winning the most points during the day. This cup went to No. 2 Canadian company, with nineteen. A private in No. 26 company, Canadian Forestry Corps, won the gold medal donated by the A.D.S.C., Canadian detached forces. Two men in these same companiese made an equal number of points in the athletic events and technical contests, and so the British army forestry officer who offered a cup for the man making the best aggregate, agreed to give each of the two men a cup.

There are 25,000,000 acres in the forest reserves in the prairie provinces and the 'railway belt' of British Columbia. The proportion of forest reserves to total area is very low, in comparison with the ratio regarded as 'good business' by progressive European states.

About $40,000,000 a year is paid in wages to workers in the forest industries.

The United States possesses about four times as much timber as Canada.



Where the forest maintains the fruit-grower's water supply. Looking toward Penticton, B.C., showing the Giant's Head Mountain and benches, with the famous Summerland orchards.

COUPLING THE FOREST TO THE FRUIT FARM

By Geo. P. Melrose, District Forester, Vernon, British Columbia.

How British Columbia's Richest Valleys Depend Upon Natural Water Storage of Wooded Mountains.

The Okanagan Valley is one of the richest and most productive of any of the valleys in British Columbia. Its annual export of fruit alone is well in excess of two and a half million dollars, and vegetables, dairy products and live-stock amount to as much more.

The valley is in the heart of the interior Dry Belt of the Province, and has an almost semi-arid climate with an average rainfall of about 12 inches in the north and 10 inches in the south. The summers are long and dry, whilst the winters are short and have a light snowfall. The bulk of the precipitation occurs during the winter months.

Distributing Water.

Agriculture in the valley is dependent entirely upon irrigation and numerous water distributing companies and corporations with hundreds of miles of ditches and flumes handle the water between the mountain streams and the farm lands.

As mentioned before, the bulk of the precipitation occurs in the winter in the form of snow. It is heaviest in the mountains and often very light indeed in the valley. This snow lies in the hills all winter and as spring and summer follow it gradually melts, first at low levels and last of all in the high peaks, and finds its way into the streams.

Luckily, the mountains surrounding the Okanagan Valley from which it secures its irrigation water are covered with a bountiful growth of trees. The forest extends unbroken from one end of the water shed to the other and from near the bottom of the valley to 5,000 feet above it. Upon these forests depend the whole success of the irrigation systms and the fruit and produce growing of the valley.

A steady supply of water during the growing season of the year is what is required for proper irrigation. The forest makes this possible in the following ways:

First of all they protect the winter snow from quickly melting by shading it from the direct rays of the sun and protecting it from the winds. The snow melts much slower in the woods than in the open, as everyone knows who has been in the woods in the early spring and seen the banks of snow there, while in the open the grass was already green. Thus the run-off from the snow is distributed over a longer period and held till well towards the growing season.

In the forest there is a continual fall of leaves, twigs and cones that gradually decay and form a spongy, half rotten top-layer to the soil called "humus." When the snow melts this humus soaks up an enormous quantity of the resulting water and holds it like a sponge. After the snow has all disappeared and surface run-off ceased, the "humus" starts giving up its mois-

ture by seepage. This process takes a long time and generally keeps a steady supply of water flowing into the streams all summer long. In effect it acts like a huge reservoir, giving up its contents during the growing season when it is most wanted. The "humus" acts in a similar manner with rain that may fall during the summer.

Again, when the humus has soaked up its fill and the water starts to run off over the surface of the ground, the roots and trunks of the trees so retard its speed that it cannot assume flood proportions. The roots hold the soil together so that the little streams cannot wash it away. This causes floods which wash down the soil and rocks into the valley bottoms, silt up farm lands and in some cases has been known to cover an orchard five feet deep in rocks and gravel. When the snow stops melting the run-off is over, but the damage has been done. No further water can be hoped for from that watershed unless there comes a rain and in that case the run-off will be just as quick and the benefits just as problematical.

The Forest Saves Money.

In all cases where a watershed is tapped for water for irrigation, reservoirs have to be secured. These need only be small in the case of well wooded watersheds on account of the steady flow of water into them as mentioned above. In the case of denuded watersheds, reservoirs have to be of a huge size to hold sufficient of the spring floods to last all summer. This necessitates great outlay of money and there is constant expense on account of the washing down of earth and rocks and the consequent filling up of the reservoir. Luckily, no such problems are presented in the Okanagan.

The foe to fertile valleys. This recent photograph shows an almost total obliteration of the valuable forest cover in the Okanagan Valley of British Columbia. View taken from Kathleen Mountain, looking west.

and so we have absence of floods and pure clear water coming down into the creeks and rivers in the spring.

When Trees are Absent.

Now consider what happens on a watershed that has been denuded of trees by fire or other cause. These effects have all been actually observed to be the result of forest denudation in different parts of the country. The snow melts quickly in the spring, as it is not sheltered in any way from the sun. The bare mineral soil has very poor absorptive qualities and can soak up little of the water and so the bulk of it must run off over the surface in a very short time.

Fires are the main cause of the forest denudation and in several cases the flow of creeks in the Okanagan has been observed to become less regular with more flood water in the spring and

At the head of Whiteman's Creek, Okanagan Watershed. Excellent forest cover of Douglas Fir and Lodgepole Pine. The value of this green area in maintaining proper drainage conditions in the fruit growing districts is obvious.

In the Okanagan district, B.C. After the Red Creek fire of 1914, showing weeds only coming up after a very severe burn. This area was thick with Jack Pine and was stripped completely, even the grass cover being removed.

less during the summer, following partial denudation by fire of the forests on the watershed.

A $5,000,000 Crop.

From the above points it may safely be concluded that the success of the irrigation system of the Okanagan Valley, and thus the safety of that valley's five million dollar crop is dependent upon the forest cover on the watersheds. For that reason as well as for the intrinsic value of the timber and second growth, the British Columbia forest service maintains a very efficient system of fire protection in action in the Okanagan and so far has been able to preserve the important watersheds intact. Their continued protection rests as much with the public in general and particularly with those who travel in the forests, as with the Forest Service. Most fires are set by human agency and if the public can be educated to the point where they will set no fires at all, practically 95% of all the fires that occur will be eliminated. The other 5% are caused by lightning. It comes down to this: the output of the Okanagan is in the hands of the people in more ways than one. They must protect their water supply while growing their crops. The Forest Service will maintain its protection system to look after all accidental fires and by constant publicity try to eliminate all fires of human origin.

We are thankful to say that a very commendable public spirit is manifest in the valley and each year we see a little betterment of conditions and a better spirit of co-operation and care with fire on the part of the citizens.

GEO. P. MELROSE.

WHY SHOULD A TREE DIE?

Dr. Bernard E. Fernow.

So impressed was Dr. Asa Gray with the persistence of individual tree life that he questioned whether a tree need ever die: for the tree (unlike the animal) is gradually developed by the successive addition of new parts. It annually renews not only its buds and leaves, but its wood and its roots; everything, indeed, that is concerned in its life and growth. Thus, like the fabled Aeson, being restored from the decrepitude of age to the bloom of youth,—the most recent branchlets being placed by means of the latest layer of wood in favorable communication with the newly formed roots, and these extending at a corresponding rate into fresh soil,—why has not the tree all the conditions of existence in the thousandth that is possessed in the hundredth or the twentieth year of its age? The old central part of the trunk may, indeed, decay, but this is of little moment, so long as new layers are regularly formed at the circumference. The tree survives, and it is difficult to show that it is liable to death from old age in any proper sense of the term.

However this may be, we know trees succumb to external causes. Nevertheless they are perennial enough to outlive aught else, to be the oldest inhabitants of the globe, to be more ancient than any human monument, exhibiting in some of its survivors a living antiquity, compared with which the mouldering relics of the earliest Egyptian civilization, the pyramids themselves, are but structures of yesterday. These dragon trees, so called, a genus of the Lily family, found on the island of Teneriffe, off the African coast, are believed to be many thousand years old. The largest is only 15 feet in diameter and 75 feet high. The Sequoias or Big Trees and Redwoods on the California coast are more rapid growers, and attain more than double these dimensions in 3,000 to 4,000 years, which may be the highest age of living ones.

BUFFALO HERDS ARE THRIVING

The current report of the Commissioner of Dominion Parks contains information regarding the national buffalo herds in Buffalo and Elk Island parks.

It is not very widely known that the Commissioner of Dominion Parks has under his care nearly three thousand buffalo, that live under natural conditions, with the same habits of feeding and the same liberty of range, within certain limitations, enjoyed by the herds on the prairies in the early days. These animals are healthy and in splendid condition. Their handsome appearance and the fact that the normal increase is taking place afford excellent proof that they are in their natural surroundings. During the year 1917 there was an increase of 356 buffalo in Buffalo Park, and 28 calves were born in Elk Island park. The report states that the younk stock are splendid types and are thriving.

COMBATTING INSECT FOES OF THE FOREST.

Fires, insects and parasitic fungi are the most destructive enemies of our forests. Each season fresh forest areas are swept by fires or devastated by outbreaks of injurious insects and fungi. The extensive balsam injury in Eastern Canada illustrates the serious nature of these insects and fungus enemies. The primary injury was caused by the Spruce Budworm, and in Quebec Province, although the Budworm outbreak has passed by, thousands of balsams have died from the primary defoliation and great numbers of the weakened trees are dying now from attacks of more recent enemies, notably the Eastern Balsam Bark-beetle, the Balsam Bark Weevil, and a very destructive sapwood fungus.

The insect enemies of Canadian Forests are being studied by the Entomological Branch of the Dominion Department of Agriculture. A bulletin dealing with Canadian Bark-beetles has been issued recently by the Forest Insect Division of the Entomological Branch, written by Mr. J. M. Swaine, Parts 1 and 2 have been published thus far. Part 1, "Descriptions of New Species," describes 40 new species of Bark-beetles from Canada and the Northern United States. Part 2 gives "A Preliminary Classification with an account of the Habits and Means of Control." In the First section of the 2nd part, the beetles and their habits are described, with a detailed account of the interesting and sometimes beautiful system of tunnels cut by the adults and their larvae. The Second section deals with Bark-beetle injuries and the means of control. Bark-beeltes are probably our most destructive forest insects. They are very small, dark beetles, varying from one to nine millimetres in length. Both adults and larvae excavate tunnels in the inner bark of trunks and branches of many of our timber trees. When green timber is attacked the multitude of small tunnels girdles the trunk in hundreds of places and the tree usually dies in less than a year from the time of attack. Their most extensive injuries to our forest in recent years have been caused in British Columbia, but they are everywhere destructive throughout the eastern woods. The injury to eastern balsam by the Eastern Balsam Bark-beetle at the present time is a good example. In addition to many "primary" species, which attack and kill green timber, many "secondary" species are always found in weakened and dying trees. These secondary enemies assist the more destructive species in killing trees, following up the original attack, but are often found initiating outbreaks in green timber on their own account.

Value of Slash Burning.

The Control Measures discussed in this chapter include the destruction of the broods of beetles during winter by modified logging operations, and properly conducted slash-burning. With the destructive species the winter is passed by the beetles and their small whitish larvae or grubs under or in the bark of the trees attacked by them that summer, and in the green slash and stumps. If infested trunks are removed and treated, by driving for instance, so that the broods in the bark are killed before June, and if, in addition, the slash is burned, the number of the destructive species may be so reduced that satisfactory control is effected in one season. Slash-burning is strongly recommended as an effective method of insect and fungus control.

The Third section gives a short account of the structural characters of bark-beetles, sufficient to explain the technical terms employed in the keys for determination in the section which follows.

The Fourth Section, comprising about 100 pages, presents an arrangement of the Canadian Bark-beetles with keys for determination, so that students and foresters with a little training in the use of keys of this kind may be able to determine the species of bark-beetles for themselves.

Accuracy Essential.

The control measures depend entirely upon the habits of the beetles, and the habits vary with the species. It is therefore necessary to determine exactly which species is causing the primary injury. There may be a dozen species of bark-beetles in the bark of a group of dying spruce, but only one or two of them will be concerned in the primary attack on the green timber.

The bulletin is fully illustrated with 31 full page plates, twenty-seven of these by the heliotype process, and five text figures, over 265 figures in all. It is distributed free in Canada to those interested in forest protection, and may be obtained through the Dominion Entomologist, Entomological Branch, Department of Agriculture, Ottawa.

Can any part of Canada furnish finer spruces than those of Mr. William Pearce of Calgary? These trees were planted by Mr. Pearce about his residence and are greatly admired.

MANITOBA 75 PER CENT. UNDER FOREST.

The provinces of Manitoba, Saskatchewan, and Alberta are frequently styled the "Prairie Provinces." While possibly the prairies may be regarded as their outstanding feature, the term is rather misleading in that it suggests the greater area to be prairie, whereas these prairies, however extensive, occupy only a small percentage of the total area of the provinces. At least 75 per cent of the entire land surface of Manitoba is covered by forests. The entire central and northern parts of the province are still practically unbroken forests. The heaviest growth in Manitoba and Saskatchewan lies generally along the Saskatchewan river from Prince Albert to lake Winnipeg, and extending some miles to the north and south.

A closer view of one of Mr. William Pearce's beautiful spruce trees on his grounds at Calgary.

South of the Saskatchewan river some of the principal tracts of valuable timber have been set aside by the Dominion Government as "forest reserves." These generally occur on elevated ridges or plateaus. North of the Saskatchewan river, throughout the mining district of this region and extending almost to Hudson bay, the country may be described as wooded, till the "barren lands" and open shores of the bay are reached.

White Spruce of Value.

Though this forest area is very extensive, it does not represent a high average of value. The hardwoods and most valuable of soft woods are missing, while the growth of prevailing trees is

Changing the tune of the prairie to "Home, Sweet Home." A fine growth of Manitoba Maple on the farm of Mr. W. Slade, in the Carseland district, Alberta.

generally retarded. The principal trees of Northern Manitoba include only a few species, namely, spruce, white and black, poplar, tamarack, birch, and jack pine. Of these, the white spruce is practically the only durable species for saw-mill purposes. It grows to a fair size on high land surrounding the lakes, averaging from 18 to 24 inches in diameter. Samples up to 36 inches diameter have been found on the shores of Reed lake. It generally grows tall and straight, up to 90 feet in height, and makes excellent lumber, pulp and paper. The black spruce is a slower-growing tree and does not usually reach such a size as the white spruce. It is found in low swampy ground. Jack pine is found on nearly all dry sandy ridges. It is used extensively for ties. Tamarack grows extensively throughout the district, and is used for poles, fences, ties, and fuel. The poplars, aspens or cottonwoods, and the birches have not yet been found of much commercial importance, but are extensively used locally as fuel.

The Fire Loss.

The greater part of Northern Manitoba was covered with a much heavier forest than that at present standing. This was nearly destroyed by disastrous fires many years ago. The present forests are principally second-growth—following such fire. Many regions, for instance, the Burntwood River district, have not reforested.

The cut of timber in Manitoba has been comparatively small, in 1916 being less than one million dollars in value as compared with sixty-six milloins for the whole of Canada. The Finger mill, located at The Pas, is one of the largest operating in the Prairie Provinces, the cut for 1917 being 15 million board-feet. This consisted entirely of spruce cut on timber berths along the Carrot river within the boundaries of Saskatchewan. Three small portable saw-mills are in operation north of The Pas. The Hudson Bay Construction Company operate one at mile 185, for their own use. The Mandy Mining Company have one on Schist lake, while one has recently been installed on Wekusko lake in connection with the Rex mine. The annual cut of these three mills amounts to about half a million feet.

A Pulpwood Plant.

Great quantities of wood for the manufacture of pulp are available, and plans are being considered for the erection of a plant at Grand Rapids, where the Saskatchewan river enters lake Winnipeg. Water-power is available at this point, and the location is favourable for the transportation of wood to the site.

Other resources of these forest areas are the extensive bogs and swamps which occur in low-lying parts. While no steps have been taken to utilize them it is believed that thy might be made to profitably yield vast quantities of peat. The production of either pulp or peat, however, has yet to be inaugurated, and more definite information must first be obtained with respect to the extent of the raw material available. It is reasonable, however, to expect that great possi-

bilities are in store for industries along these lines.

As pointed out by the Director of Forestry in an address before the Canadian Forestry Association at Winnipeg in 1913, Manitoba may yet become a great forest province. The information in this connection given in the following paragraphs are obtained from this source.

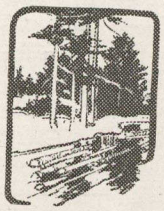
Northern Manitoba offers an attractive field for the practice of commercial forestry. Several European countries, with similar conditions in respect to geological and climatic conditions have made great successes of such ventures, and are deriving handsome revenues from them. Investigations have shown that the rate of tree growth in Manitoba compares favourably with that in Germany, France, and Sweden.

Sweden's Example.

The case of Sweden might be cited as an indication of what could be hoped for in Manitoba by following a suitable forest policy. Sweden is a northern country having similar conditions of climate and soil, much of it being underlain by a granite formation like that of the Laurentian area. It is about equal in extent to Northern Manitoba, its total area being 172,876 square miles as compared with Northern Manitoba's area of 178,100 square miles.

By following a systematic forestry policy during recent years Sweden has placed the industry on a profitable basis, and is now receiving a national revenue and providing employment for thousands of her people, at the same time providing for replenishing the forest supply in proportion to the consumption. In 1905 her woodworking industries included 1,370 saw-mills, 138 pulp-mills and 20 match factories, giving employmen to 56,424 people. The government forests themselves employed a staff of 971 rangers and officials, and yet yielded a net revenue of $2,122,625. The total values of her forest products for the year were $107,000,000. Comparing this with Manitoba's products of less than one million dollars but with natural conditions as favourable, it cannot but suggest the great opportunities that await the province in commercial forestry.

RECONSTRUCTION!– AND THE CALL OF THE FORESTS!



By Ellwood Wilson, Chief Forester,
The Laurentide Company, Grandmere, P.Q.

A Challenge to Canadians to Face Critical National Problems with Courage and Daring.

The effort necessary to win the war has stimulated all the nations engaged to a pitch of effort never before approached. There has been a great awakening and quickening of life both material and spiritual. Old formulas have gone by the board, the old catch words by which the politicians have fooled us have been exposed in all their pitiful nakedness and old abuses which have been tolerated for centuries have been swept away in a day. For some time to come it is going to be harder to fool the people than ever before. We have seen the terrible burden of alcohol almost removed, the nationalization and rational handling of a few of the businesses which make modern life possible, the apportionment of food and coal so that all could have their share, and the curtailment of luxuries. Why can we not continue to be sensible and patriotic now that the war is over? A very small fraction of the money which has been spent for the war would see the country covered with good schools, with good roads, and our people instructed in the proper care of their health by competent men under a Minister of Public Health. If it was necessary to train our men and to put them in the pink of condition to win the war, why is it not far more important to bring up our children with sound minds and well trained bodies fitted to take their place in our great country and not left to grow up haphazard, half starved, uneducated and untrained, some of them condemned to fill the jails, the asylums and the brothels. When our men come back from the front they are going to ask some of these questions and they are going to insist that they be answered in the affirmative. The

world has been made safe politically, now it must be made safe economically.

Great Enterprises Ahead.

The great lesson of this war is the necessity for careful planning of all operations and their correlation. The Japanese in the Russo-Japanese war showed how sickness among the troops could be prevented by careful planning. The Germans showed what a definite national aim and planning can do for a country and their detailed plans and preparations almost won the war at the first rush. The fact that their aim was a wicked one defeated them. It was only when the Allies settled down to coordinated operations under a single head, when they had learned to plan ahead for every possible contingency, that the war was won. Remember how our attacks were planned in the most mniute detail. This system should now be employed to make our country the best in the world. We must choose a high aim, to make Canada in every respect a truly great nation.

We must plan first of all for a better educational system. Our present one is inadequate and antiquated, our teachers paid little better than day laborers. We must plan for better housing and hygienic conditionos so that our future citizens may grow up sound and healthy men and women. We must teach them their duties as citizens so that they may understand and appreciate their part and duty in our development.

We must plan for good roads which will make it possible for the children in rural commulities to take proper advantage of the schools and the farmers to get their produce to market and keep in touch with the outside world.

State Control Essential.

One of the questions which has been waiting for a sensible settlement is that of the care of the greatest of our national resources, our forests. We must face and settle this question at once. We must see that our forests are secured from the fate which befell those of the United States and guard them, by keeping them in the hands of the Governments. The time required for the growth of trees makes it imperative that something should be done at once and that the authority managing them should have a definite policy which shall be continuous. We need land classification so that non-agricultural lands shall not be opened to settlement. Where they have been settled or where settlement has been tried we see misery and squalor, illiteracy and the abandoned farm. We must have adequate fire protection so that carelessness cannot wipe out millions of dollars worth of irreplacable timber in a day or so. We must have proper care in cutting so that our supply will be continuous and we must have replanting so that the increasing needs of the future will be taken care of.

A Work for Government Services.

Had it not been for the foresight and carefully worked out plans of the French Foresters in planting up their waste lands and keeping up their supply of timber we should in all probability have lost the war, as there were not enough ships to take over the huge amounts necessary. The planting of the Landes district in France took a lot of courage and entailed the expenditure of millions of dollars but it has paid financially and in the time of need helped to save France.

A scheme is now on foot to reforest the British Isles which will require the expenditure of some fifty million dollars but which will ultimately pay back large revenues and go a long way toward making England independent of the outside world for a large part of her timber and, in case of another war, give her all that she would need.

Here in Canada we need some sort of definite policy for our forests. Our Government Services do little but administrative work and are letting the future pretty well take care of itself. Now that the fire hazard has been reduced by better protection methods, it is high time that plans for the proper use and continuation of our forests should be made and put into execution.

Employment for Soldiers.

Our soldiers who have been fighting abroad have been living out of doors with plenty of exercise and lots of action; it will be very hard for many of them to return to shops, factories and offices and our forests offer ideal employment for them, good physical work in the open, the constant change of scene which nature offers, and work which is fascinating and which has a high end in view. The kind of work is especially valuable for those who have been shell shocked or gassed and there are many kinds of work which can be carried on by those who have been wounded. Many of the returned flying men will be able to find work in the forest protection services where they can engage in patrol work and mapping. The large sections of this Dominion now uncharted can in a few years by means of flying boats and moving picture cameras be completely and accurately mapped. Not only that but the photographs so taken will give us at once the areas and Linds

"WHEN YE HAE NAETHING ELSE TO DO, YE MAY BE AYE STICKING IN A TREE. IT WILL BE GROWING WHEN YE'RE SLEEPING."
—Sir Walter Scott.

of timber which constitute our forests, giving us a complete inventory of this source of wealth with but a small fraction of the cost and time which would have to be expended, using the old methods, and with far greater accuracy.

Community Forests.

As is shown by Mr. Clapp of the U.S. Forest Service in his most interesting bulletin "Forestry and Community Development," Forests are almost absolutely necessary to the best development of agricultural communities. The work on a farm is seasonal, heavy in summer and light in winter and the forest offers winter occupation. Then too the farmer needs firewood, fencing and lumber, all of which can be supplied by the forest. The idea of settling soldiers on farms is a good one—if the soldier wants to become a farmer. Farming to-day, however, is a very technical and highly specialized business and for a man with no previous training or experience to undertake it is rather risky. He is likely to lose quite a little time and money in getting the experience for himself and so become discouraged. In settling returned soldiers upon the land they should not be given land haphazard but regular communities should be planned for and laid out, which would give much better chances for success. The land should be so laid out that each farm would be near the community centre, either by laying the farms out in units which would lie in a circle around the community centre or on the Quebec system of long narrow farms which brings all the houses close together on the roads and makes all the people neighbors. Only the agricultural land should be cleared and the forest lands left in trees or planted up and kept as a "community forest" which would be managed for the common good and would supply the community with forest products. This has been already tried out and been proved a great success, some towns paying all the municipal expenses out of their revenues from such forests, doing away with local taxes.

Soldiers are so accustomed to companionship that when they first return they are likely to be very lonely and when set down on isolated farms become very homesick and soon give up the life.

The life of the forest is a free, healthy life and breeds a splendid type of men, as witness the famous "Blue Devils," Chasseurs Alpins, and the German Jaeger Battalions.

Trained Woodsmen Wanted.

One of the great needs in Canada to-day is that for forest "rangers", that is, men who will act as fire-rangers, forest guards, scalers, inspectors of logging operations, drive foremen and the like. The day of the untrained man in the woods is passed. The old wasteful, careless methods must go, and for this we need the trained ranger. The professional forester we have already and he is more and more becoming a factor in the development of the country, but where we need one forester we need one hundred rangers, and there has been no effort to fill this want until rcently, a ranger school having been started in British Columbia. With such a school training returned soldiers, this want would be filled and a valuable new craft opened for them, for which their campaign experience would be extremely valuable. They could also be trained as game protectors and guides for both of which there is great need. Canada is not yet fully alive to the immense asset which the tourist traffic would be to her and this should be developed. The wonderful lake countries of Northern Ontario and Quebec only need to be rendered accessible to bring in large numbers of wood lovers who would prove an important source of revenue. But to-day in these sections good guides are almost unknown, the game is slaughtered with practically no attempt at law enforcement whatever.

The Soldier in Planting.

Another wonderful opportunity for the returned soldier would be in Provincial police forces modeled on the Northwest Mounted Police, whose method has been so successfully copied in New York and Pennsylvania.

With the beginning of planting operations on a large scale by corporations, whose example will soon be followed by the Provincial Governments, a large field opens up for the returned soldier with ranger training. The men who have been over with the so-called Forestry Battalions would be especially easy to train for woods work and should naturally be employed in lumbering operations in this country on their return. The lessons of the French forests with which these men have come in contact should make them valuable to us here.

The Task Only Begun.

We can well be proud of the work which has been accomplished by our Canadian Forestry Association, which has put Canada well in the van of forestry progress, but we must by no means rest content. We have only scratched the scurface, our fight has just begun and we still have many worlds to conquer. The secret of the whole thing is the education of the public in regard to our forest wealth and all that it means to the Country. We must strive first of all to build up an enlightened public opinion and then go forward to the conquest of the great problems which are crying out to us for solution. "Wake up Canada!"

THE PROBLEM OF ONTARIO'S PINE SUPPLY.

By W. F. V. Atkinson, Chief Forester,
Spanish River Pulp and Paper Mills.

The forests of Canada, from which practically speaking must come our future supply of wood for all purposes, are now suffering serious depletion and are within a measurable period of exhaustion, not only for export but also for home use, unless some efficient laws and regulations be soon put into effect. Indeed, this disaster is possible within the lives of some of our present citizens if the fact is not quickly admitted and sinks in deep enough to produce a definite and consistent organization to prevent it.

I have no doubt that the intelligence of our citizens will insist in efficiency with regard to their forest estate before total depletion takes place, but I wish to bring out the point that every season, almost every day, that passes while present methods prevail means a loss to the country as a whole, and to each citizen respectively. If each citizen to-day could realize how much it actually means to himself and to his family in dollars and cents which he, or they, will have to pay out in taxes for their share of this loss, I am sure that the necessary steps to a remedy would be immediately forthcoming. I wish this was as clear and real to all as it is to those of us who have had the opportunity to see and study conditions and the experience to appreciate them.

Regarding Ontario's Pine.

What should then be done under the circumstances? I maintain that no wood should be cut at all unless it is mature, that is to say, can no longer earn by growth increment sufficient to permit it to remain standing, or is so situated that it is liable to be destroyed before it can be cut down.

The only way this can be done is by selection. This means, speaking broadly, the marking of such trees as may be properly cut, or that must be cut, and the protection of those that must not be cut, and at the same time it entails full inspection and measurement of such trees as are cut. It would no doubt surprise some of our citizens to see 60 per cent of the contents of pine trees felled for lumber, left to rot upon the ground because the quality is not sufficiently good to pay the Crown dues. It would also astonish them tto learn that in the so-called pine reserves of the Province, taking the total contents of the stand of timber as a whole, there is no increase or growth increment whatever of the total quantity, and that this condition is not the case where stands of timber are properly operated. These details are only an insignificant part of a great number of conditions which exist to the detriment of the forest unknown to the owners which are in the last analysis the citizens of the Province.

The System at Fault.

With the present system the officers of the Crown are engaged in seeing that contracts and regulations, made largely by their predecessors, are carried out in the best way possible under the circumstances, and they have not either the time, the authority, nor the means at their disposal to carry on or control the exploitation of the people's forests to their greatest benefit. Even if they knew what was the best method, no fault lies with them, it is in the system.

It is only by continued personal inspection and properly graded instructions and the decision of moot points by a competent staff that the lumbermen can get fair treatment and at the same time be obliged to conform to regulations based on a continuous timber supply. This means a staff of employees not at present contemplated. The required staff should consist under the Provincial Forester, of District Foresters, Assistant Foresters, Forest Examiners, Forest Assessors, and a host of Forest Assistants to be graded and controlled by their respective chiefs and to be subject to promotion as well as to discharge on the recommendation of their superior officers after examination or appeal to a Board appointed by the whole body, and sitting with the Provincial Forester as its head.

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BIG ORDER OF CANADIAN LUMBER.

Ottawa, Jan. 7.—As the outcome of negotiations carried on by the Canadian Trades Commission for the past month the timber controller of Great Britain will purchase in Canada half a million standards of lumber, equivalent in the Dominion to one billion square fee. The lumber, which is to be of all grades, will be bought under the direction of the timber controller through British brokerage houses and Canadian timber agents in London who will deal direct with the Canadian lumber producers.

It is understood that every Canadian producer who is registered on the lists of the trade board at Ottawa will be given an equal opportunity to sell. There is also to be an allocation of purchases upon a territorial basis, thus ensuring a fair proportion of purchases to Western Canada.

This lumber is t be bought within the next twelve months. It will represent a total transaction in money value of about $40,000,000.

The necessary Canadian credit which rendered the large lumber transaction possible was arranged some weeks ago between the Dominion government at Ottawa and the Imperial government. This credit is to be availed of to the extent that is rendered necessary by the state of international exchange. The British government is to supply the shipping to carry this cated the character of business which it is lumber to Great Britain. The transaction indiexpected the trade mission will be able to obtain from now on, particularly upon the continent.

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THE JOURNAL'S QUESTION BOX.

Readers of the Forestry Journal are invited to take advantage of the Forestry Association's facilities for securing authentic answers to questions relating to forestry, tree planting, reforestation, and kindred subjects. A great number of questions are answered by mail and such of these as may have general interest will be used henceforth in the Journal.

Send along your question. We will do our utmost to obtain a satisfactory reply.

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You can talk on the long distance now between midnight and 4.30 a.m. for a quarter what it costs during the day; and, speaking of us Scotch again, we see where some folks are going to get very little sleep.

—*American Lumberman.*

Picture by courtesy Acton Pub. Co.

Muscular Canadian Lumberjacks at Work in a French Forest.

SURVEYING BY CAMERA FROM THE AIR

By Lieut.-Col. Cull, D.S.O., R.A.F.
in an address before the Geodetic Survey of Canada, December 3, 1918.

Photographing Lakes, Rivers, Mountains, and Forest from Aeroplane an Economical and Accurate Method.

EDITOR'S NOTE:—*The following most interesting paper by Col. Cull will be eagerly read by all who have developed an interest in the aeroplane and its adaptability to forest surveying and fire detection. Col. Cull has a notable war record, and was brought to Canada to organize the air service in connection with the Canadian naval forces.*

Before going into the detailed proposition I would like to briefly touch on the progress of aviation and aerial photography, as well as to submit lines along which, in my opinion, aerial work could be used as an adjunct to survey work.

Early Aviation.

As you know, some twelve years ago the first flight of any practical value was carried out in France by the Wright brothers. One is apt to forget about these pioneers, but whatever progress has since been made is in no small measure due to the Wrights. I was trying to get into aviation myself then, and cherish, together with a lot of other people, a very kindly feeling for them and the country to which they belong. I would like to say, too, that from what I saw of American pioneer flying officers in France; and latterly in my dealings with the United States Naval Aviation authorities over here, in connection with the formation of the Royal Canadian Naval Air Service, I have seen nothing to change those opinions. A few months before hostilities ceased, at a rather critical submarine time, they were very generous and of the greatest assistance to us over here in connection with the Atlantic coast.

During the four years preceding the war fairly rapid progress was made in aviation, particularly by the Germans, who took it up along methodical

military lines and made several records, such as a duration flight lasting twenty-four hours. The British and French were not much behind, but they never tackled the problem as methodically as the Germans did.

Aerial Photography.

As far as I know, nothing much was ever done about aerial photography before the war, the only aerial photographs that were taken probably being more or less amateur efforts with kodaks. When war broke out, everyone had to start in to try to develop aviation as quickly as possible. There is no need for me to tell you what progress has been made during the war as you know already. In every paper you see records of the extraordinary feats that are done nowadays.

Military Necessity.

One point I would like to emphasize is that during the four years of war all this progress has been made along military lines, and machines have been developed to obtain high military efficiency, consisting of very high climbing powers, very high speed, and abilities to maintain this speed at very great altitude.

Now that hostilities have ceased, I think we shall see progress just as rapid, or very nearly so, as during times of war; but machines will be developed along slightly different lines. The doing away with the necessity of carrying machine guns, ammunition, bombs, etc., as well as the necessity for very rapid climbing powers will give machines even more excess power than they possess today, thus allowing the engines to be run more throttled down and, in consequence, improving their reliability and their life—attention will be turned to developing much slower landing speeds than are now possible, which is a most important desideratum, and other advantages, such as increased stability, will result.

Commercial Uses.

With the application of aviation to commercial purposes, I think machines will tend to specialize for the various jobs they will be called upon to perform. For instance, machines intended for mail carrying purposes will still have to possess a high speed; machines intended for passengers or goods will sacrifice a certain amount of their high speed for big weight lifting capacities.

The particular thing I am supposed to be here tonight to talk about fits in very well with the machines as they exist at the present time. As you know, it was the custom on all fronts to make complete and detailed maps by aerial photography of all trench systems, as well as items of interest in the back areas, such as aerodromes, etc. Aerial photography has progressed out of all knowledge during the war, and the most marvellous photographs are now obtainable from very great heights.

Snapping From 20,000 Feet.

At the beginning of the war, machines used to sally forth with what would now be considered an obsolete camera and take fairly good photographs from low altitudes. As the efficiency of the anti-aircraft defences increased, machines were driven higher and higher, to escape being hit, and in consequence the efficiency of the cameras to be used had to be increased in proportion. Nowadays, photographs are usually taken from some height not below 15,000 feet, and in most cases the height of photographic work is in the neighbourhood of 20,000 or more feet Cameras used for this purpose have a focal lens of about 4½ feet and cover a plate 10 by 8 inches. I believe I am right in saying that the photograph taken includes about six square miles of country. The actual cameras themselves are comparatively simple looking arrangements containing a high class, wide angled lens, a focal plain shutter, and some form of plate changing apparatus. The early cameras used the Mackenzie Wishart system, but the manual operation required to work this, under conditions of extreme cold and attention to other necessary duties, such as defence against enemy aircraft, soon produced the more simple changing box which is quite workable with heavily gloved hands and which is capable of carrying fifty to one hundred plates in one lot.

Overlapping Pictures.

When taking a series of photographs, they are usually taken at fixed intervals of time, according to the speed of the machine and the number of plates carried. In all cases, however, they are taken so that each photograph along a certain line overlaps with the one before it and the one after. When one comes to join them together one merely has to pick out a landmark occurring in any two photographs, superimpose it, get the bearings of the photographs and any lines that may be on the photographs coinciding.

In addition, however, to those composite photographs, aerial photigraphy is used very largely from the stereoscopic point of view. By this I do not mean to say that actual stereoscopic cameras are used; but, to take an instance, suppose you are flying along a line in which a particular point occurs, of which detailed information is required. This particular point can

be made to occur in two photographs. What is then done is to cut out the part in each photograph containing the point and paste the two photographs alongside each other, on the usual stereoscopic card. Here it is necessary to get the positions of the two photographs by experiments, as for certain optical reasons, unknown to me, if you put one photograph on the right whereas it should be on the left, the proper effect of height and depth is reversed, although the two photographs may look identical. However, once this is successfully done the combination of the photographs can be used in the usual stereoscope and a very good idea of the proper perspective obtained.

Effects of Stereoscope.

Another interesting point is that two different photographs giving, for instance, a fuzzy appearance singly can, by viewing stereoscopically, be made to give a very good single image.

Using this method, it is possible to very closely examine positions on the ground, and in case of batteries I know it is possible to tell whether emplacements are made of concrete or of sand bags. This method obviously offers chances of value in the examination of items on the ground which, from a survey point of view, special information is required about.

Before coming over here I was stationed at Dunkirk for the last year, where a great deal of aerial photography was done over places such as Bruges, Ostend, etc., where the Archies were severer probably than anywhere else in the world.

Survey Photography.

To continue now with aerial photography, as applied to survey work.

When I came over here, I knew practically nothing about survey work. I gather now that photography plays a considerable part in survey work over mountainous country, and that expeditions set out in summer months in order to photograph ranges of mountains from known positions with the idea of getting the heights and positions of the mountains. I have seen some of these photographs taken by the Geodetic Survey and have admired them immensely, but looking at them it struck me that when you photograph a mountain there must be various foothills and minor mountains leading up to the main peak and that photographs taken from one point will not give any idea of what lies between these foothills and the mountain itself nor of what lies behind the mountain. I suppose to obtain particulars of these it is necessary for a party to go round to another point, at a different angle to the original, and to make another set of photographs from there. This further expedition is naturally a matter of time, and I think it possible that aerial photography may be able to make much of this unnecessary. The machines, working in conjunction with a surveying party and in touch with them by wireless telegraphy or wireless telephony, could receive orders to fly over any particular portion of the mountain and take such photographs as are required. For instance, a photograph taken immediately over the top of a mountain will show the general contour of the mountain and all its couloirs and surrounding peaks. It will give no idea of the altitude of the mountain, but it will certainly show a great deal which a photograph taken from some known point opposite will not show, such as the configuration of the snow fields round the peaks, the distance between individual peaks, and possibly such a photograph might give a good indication of the best method of climbing the peak, if this is required.

Mapping Rivers and Lakes.

To get away for a moment from mountain work, aerial photography could give very valuable results in the mapping out of rivers and lakes. These particular objects are especially adapted to aerial photography, as it is possible to obtain in one photograph the shape of an entire lake, and a series of photographs of a river will give the course of a river. Without knowing anything about mapping out rivers and lakes, I imagine it must be a case of covering most of the water in boats and fixing numerous positions along the shores by means of triangulation, so that in this case an aerial photograph might be able to dispense with many days of work. Photographs taken over water would also, to a great extent, show the configuration of the bottom, so that unless precise details were required, the necessity of taking soundings could be obviated.

Life of Aeroplanes.

Many people, without stopping to think, are of the opinion that for the purposes of flying all that is needed is a good looking machine, a pilot, and one mechanic. If one went by the papers one would be apt to think that all that has to be done is for the pilot to step into the machine, the mechanic to give the propeller a twist, and off the machine goes. As a matter of fact, this part of flying is only a very small item, and it should not be necessary for me to say that the whole success or otherwise of suc-

cessful and continuous flying depends on the preliminary organization, and on the organization during the period in which flying is carried out. This involves all kinds of detail, not the least among which is the transportation of the machines, stores, etc., to the point of departure, and in this country this particular item would be quite a serious matter. In a small country like England, it would be quite possible for a machine to fly to the point of departure, thus saving a lot of bother; but in a vast country like this it would be uneconomical, as aircraft engines have only a limited life before they require overhauling and machines would arrive at their final destination, after many stops, in a state requiring several days of careful overhauling, let alone the possibility of breakdown at some of the landing places en route.

Public Control.

If Canada has an Air Service my idea would be for any department requiring assistance in the aviation line to make application to the Air Department, stating their wants, and then rely on the Air Department to provide the necessary equipment to cope with the situation. In the early stages of an Air Department, the charge to the department requiring the work would probably be purely nominal, as one of the main wishes would be, to a certain extent, to educate the department and the rest of the public as to the possibilities of aviation. In a year or so, however, it would only be reasonable for the Air Department to send their account in for the actual working expenses; but this would not include any percentage of the cost of stores and spares which were not actually used, as on completion of the expedition these would all be returned, having been kept in good condition in the meantime, and be put back again into circulation, while the personnel would be returned to other duties.

Nationalization is Best.

To get off the track of this lecture for a second, aviation run by a private company on a very big scale, embracing as many diverse interests as possible, or as a National Service doing the same, could, in my opinion, be made to well pay for itself in this country, but the scale would, I think, be too big for any company to undertake for some years to come, and so everything points to nationalization here, as a company on a small scale trying to run things economically would only let themselves and the public down, and by their mistakes and shortcomings queer the pitch of aviation with the general public. You may take is at an axiom that false economy in aviation material and personnel is a great mistake, and that the best cannot be too good. There is good reason for saying that an Air Department should be run as a business concern, showing a balance sheet, as moderate working expenses would show it was being of value to the community, whereas big working expenses would show it was not and that a change of policy or organization was required.

The public are apt, in talking about aviation, to neglect the possibility of lighter than air craft; but with the advent of the efficient semi-rigid ship and very much more efficient rigid ship, based on the old Zepplein design, I think lighter than air work is going to play a very important part in the future of aviation.

Crossing the Atlantic.

Merely to give one instance of this possibility, I want to tell you that the modern Zeppelin, the total weight of which is from 60 tons, can carry sufficient fuel to cross and recross the Atlantic three times, as well as passengers, material, etc., to the extent of 20 tons, all this being carried out at a speed of some seventy miles an hour.

R. H. CAMPBELL RECOVERED.

It is with much pleasure that the Journal chronicles the full restoration to health of Mr. R. H. Campbell, Dominion Director of Forestry, who was seriously injured near the Pas, Manitoba, while on inspection duty. Mr. Campbell returned to Ottawa a few days before Christmas and took over most of his official duties.

A GREAT SERIES FOR THE 1919 FORESTRY JOURNAL.

Commencing with the February issue, Dr. C. D. Howe, of the Faculty of Forestry, University of Toronto, will write a valuable group of articles for the Canadian Forestry Journal, the first of which will be entitled "The Making of a Spruce Tree."

Every reader in whom the working of Nature has aroused a sense of wonder and curiosity will follow Dr. Howe's stories with eagerness from month to month. Not more than a page of two to each contribution—popularly written and well illustrated!

The first article by Dr. Howe comes in your February number, which will be issued by the Association not later than the 10th of the month.

The Loading Deck at 60th Company Camp, Canadian Forestry Battalion, Vosges Mountains, France. The logs are fir and spruce.

28th Company's Camp in the Vosges Mountains. These mills were designed to cut 20 thousand board feet in 10 hours, but under stress of war average 35 thousand feet, with some record cuts of over 50 thousand feet per ten hours.

A LAND WHERE THE FOREST IS AUTOCRAT

By R. G. Lewis, B.Sc.F., late Technical Officer with Canadian Forestry Corps in France.

In the Jura Mountains, almost every Town runs a Communal Forest to Ease Taxes.

During the war the French forests proved to be one of that country's most valuable assets. Not only did they provide the French Army with lumber and fuel wood, but they also supplied the needs of the American and British forces in France and to a certain extent those of the Italians. Owing to the foresight of the French Forest Service in times of peace the supply was ample in time of war, but in the early days of the conflict men in sufficient numbers were not available for the exploitation. A well-known militatry authority is on record as having stated that the need of wood in the trenches in 1916 so hampered military operations that, could men have been secured to cut and saw the timber in French forests for the use of the armies, the war would have ended in the fall of that year. This may have been a slight exaggeration but the fact remains that modern trench warfare is enormously dependent on wood. From the "duck board" that floors the trench in the front line to the storehouses at the base there are many uses to which this commodity, and it alone, can be put. Huts for housing troops, plank roads, gun emplacements, trench and dug-out construction all consume lumber in enormous quantities and every advance or retreat means a loss of material and an increased demand.

12,000 Canadians Used.

The Canadian Forestry Corps started as a modest battalion cutting timber on some of the large estates in England and Scotland. Its activities were extended to France during the winter of 1916-1917 and being formed into a Corps it grew until it became one of the most important parts of the Canadian force in France. At the termination of hostilities there were at least 12,000 Canadians engaged in cutting down French forests and sawing them into lumber for the French and British armies. Many American Engineer Companies were engaged in work of a similar nature for the American forces, French civilians and Russian troops in France working under the direction of the French Forest Service also made steady inroads into the supply of standing timber. Exact figures to the extent of this activity are not available, but one thing is certain, that the Forests of France have not been destroyed and they still remain as a valuable asset to the nation and a monument to its thrift and foresight. Is this not a striking argument in favor of scientific forest management?

Although the consumption of wood in France in peace times was so great that the importations were valued at three times the exportations, the administration had adopted the policy of reserving about a quarter of the available supply for emergency. When this emergency arose the timber was available to meet it without borrowing too heavily from the needs of future generations.

French forests are scattered through the farming, grazing and vine growing lands in such a way that no large areas exist at a great distance from settlement and transportation facilities. There is a ready local market for small material obtained from thinning and improvement cuttings, so that the expense of keeping the stands up to a high state of perfection is not great. Defective trees can be removed as soon as discovered and their wood disposed of at a profit for fuel. The result of this was evident to the Canadian lumbermen working in France. Defective material of saw log size was almost unknown.

Chips and Brush Picked Up.

The utilization is carried out in such a way that practically nothing is wasted, even chips and small brush are removed by the inhabitants for fuel. From the State forest the material is marketed in such a way that the minimum damage is done to the stand remaining. The material is sold, often by auction at a certain price per cubic metre, measured on the stump and including the entire volume of the tree, bark and branches as well as the trunk down to the root collar. There are fines levied for all damage done to the remaining stand, although allowance is made in fixing the rate of these fines for unavoidable damage. The result of this method of selling timber is that the contractor takes the

greatest possible care to cut his stumps as close to the ground as he can, to utilise the branches for fuel and to avoid damaging the remaining trees in felling those he has purchased. The upset price in the case of an auction is so fixed that with reasonable care the contractor can make a fair profit in his undertaking.

The French Lumberman's View.

Most of us are liable to fall into the error of supposing that scientific forestry is an affair of the government and we are surprised to learn that in France 65 per cent. of the forest area belongs to private individuals, while 21 per cent. is the property of the communes and public institutions. Only 12 per cent. is the actual property of the State. These communal forests are under the administration of the Forest Service to a large extent and their owners pay a small tax per acre for this service of advice and supervision. Even the forests owned by private indivdiuals are subject to State supervision to a less extent. They cannot be cleared or over-cut if such action is considered detrimental to the public welfare.

The inhabitants in and about the forests take an enormous pride in the forests whether they are owned by the State, by communes, or by private individuals. With true French frugality they make it their business to see that the regulations of the *régime forestier* are carried out and that there is no waste due to fires, trespass or careless utilization. This support which publci sentiment gives to the idea of scientific forestry is everywhere in evidence. Providing for the needs of the future generation is an essential part of the national spirit of France. I have been asked by many French people who had no direct proprietary interest in the matter why we Canadians cut such high stumps—and we did cut them high according to French ideas when we first started operating—why we broke so many trees in our felling operations and left so much valuable debris after we were finished with an exploitation. I explained that we were working under pressure of circumstances, that the army demanded increased production of lumber in order to win the war even at the expense of some considerable damage to the forest. The answer to this explanation was frequently the question, "What is the use of saving France from the Boche if all our beautfiul forests were destroyed in doing so. France cannot exist without her forests. What will our children and grandchildren do without wood when the forests are destroyed, if the Boche comes or not?" This argument was not sound as we were not destroying th forests, but the extent of public sentiment was plainly shown.

Municipal Forests.

Respect for the Forest service and its officers is almost universal. We had many occasions to call on Forest Service officers to adjust matters pertaining to damage to private property in connection with our exploitations. The owners realized that the damage was unavoidable and were always quite willing to submit to the arbitration of the Forester and to accept his estimate of the damage.

The communal ownership of forests in France is a very interesting condition for study with regard to the possibility of its adoption in some modified form in Canada. While this form of ownership in France is often the result of an adjustment of feudal conditions, many communities and public institutions have actually purchased forests as an investment for the benefit of their members and the future generation. In the Vosges and Jura Mountains almost every village and town has its communal forest from which it obtains a regular annual revenue. This revenue may consist of the funds obtained from the sale of material cut in the forest applied to local improvements with a resultant reduction in taxes. In many cases dwellers of the commune receive, pro rata, their supply of firewood and wood for fencing, building and construction of different kinds, from the communal forest. In some cases where the population of the commune is small and the forest large and productive the commune becomes a modern Utopia. No local improvement taxes, free firewood, and workwood and a revenue in actual cash, all derived from the wise investment of past generations. The forest being managed under certain State restrictions has become a permanent source of revenue.

R. G. Lewis.

GROWTH OF SPRUCE.

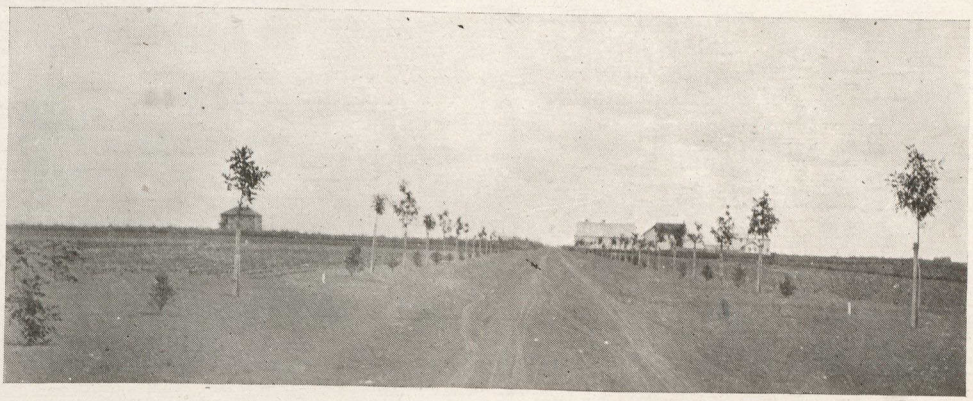
It takes about forty years for seedling spruce trees to attain a diameter of one inch, 100 years to makea 6-inch tree, and 150 years to reach the minimum diameter limit of 12 inches established by the cutting regulations for pulpwood in Quebec for white and black spruce, according to the ninth report of the Commission of Conservation.

Building up a new forest nursery, under the Dominion Forestry Branch, at Sutherland, near Saskatoon.

A NEW TREE SUPPLY BASE IN THE WEST

One and a Half Million Trees Set Out in the Past Year.

The Tree Planting Division of the Forestry Branch, Department of the Interior, has for the past eighteen years been encouraging the plant- of trees by settlers of the prairie in Western Canada. The primary purpose of this planting as planned by the Department is the providing of shelter belts against adverse winds for dwellings, live stock and gardens, and to beautify the home surroundings and later perhaps become a source of supply for fuel. That the Department's co-operative system for the distribution of trees has been an unqualified success is evidenced by the fact that the producing capacity of the 480-acre nursery at Indian Head, Saskatchewan, was reached several years ago. From 54 applicants for trees in 1901, the number steadily increased until it had reached 5,723 in 1910, and the trees set out each year during this time rose from 58,800 to 2,570,000. It became apparent that if the rates of increase in applications continued it would soon become necessary either to obtain some additional supply or to reduce considerably the number of trees sent out to each applicant. To take the latter step was not considered advisable, since satisfactory growth and protection can not be maintained unless the trees are closely planted, and the Department accordingly proceeded to secure a new nursery site. After carful investigation a half section of land located near the town of Sutherland in the outskirts of the city of Saskatoon, Saskatchewan, was chosen in 1912. In



Some encouraging results in the planting of hardwood trees at the Sutherland Forest Nursery.

selecting the site three ponits were kept in view, viz., suitability of soil and climate for growing trees; facilities for shipping stock; and the proximity of a temporary labour supply. The Saskatoon nursery is so situated that stock can be shipped by the Grand Trunk, Canadian Northern and Canadian Pacific Railways and serve all the country to the north of Saskatoon and the main lines and branches running east and west of Alberta and Manitoba, leaving the southern half of the provinces to be served by the Indian Head Nursery. Recipients of trees in the northern portion of the provinces are thus saved an appreciable amount for express charges.

The Saskatoon Nursery is operated on similar lines to the one at Indian Head under the direction of Mr. Norman M. Ross, Chief of the Tree Planting Division and the immediate supervision of the Superintendent, Mr. James MacLean. During the first four years of its existence no material was produced for distribution. This time was required to lay out the ground, erect buildings, prepare the soil for seed beds and establish the plantations necessary for the shelter of the nursery plots. In 1916 the first shipments were made to applicants and the number of trees sent out each year from the new nursery have been steadily increasing. In the spring of 1918 over one and one half million trees were distributed. The species included Manitoba maple, ash, Russian poplar, willow and Caranaga. Evergreens are not grown on the Saskatoon Nursery for distribution. At present all evergreen stock is sent out from the Indian Head Nursery. Later, when the newly established shelter belts on the Saskatoon Nursery can provide the necessary protection, the raising of these species may also be undertaken on this nursery.

As yet only a small part of this new nursery is being utilized for the growing of stock. As the demands increase the area will be enlarged. Those portions not best suited for the raising of young trees it is planned to utilize for permanent demonstration and experimental plantations, in the same manner as similar areas are being used on the Nursery at Indian Hed.—B. R. Morton.

A PINE-TREE AIN'T A MAPLE.

Old Crazy Pete he says to me,
"A pine-tree ain't a maple tree,

"A tamarack it ain't an oak."
"Of course," says I, "Now what's the joke?"

"Just this: At times a wife or boss
(They're much alike—it's hoss an' hoss)

"Expect an oak to be a pine—
Or so, at least, have all of mine."

"I guess that I don't follow you,"
Says I, "or what you're leadin' to."

"The oak is strong," he says. "It ain't
As soft as pine for takin' paint.

"For hardness maple sure is good,
But it don't give like other wood."

"Of course," says I, "they differ; each
Has its own value—even beech."

"Just so. The man who's built to lift
Ain't like to have no other gift.

"The man who's handy with his brain
Won't never bust no lawggin'-chain.

"The good provider may not lead
In table manners takin' feed.

"Whereas, upon the other hand,
The loafer's manners may be grand.

"I guess we all are just like these—
Have certain virtues, men an' trees.

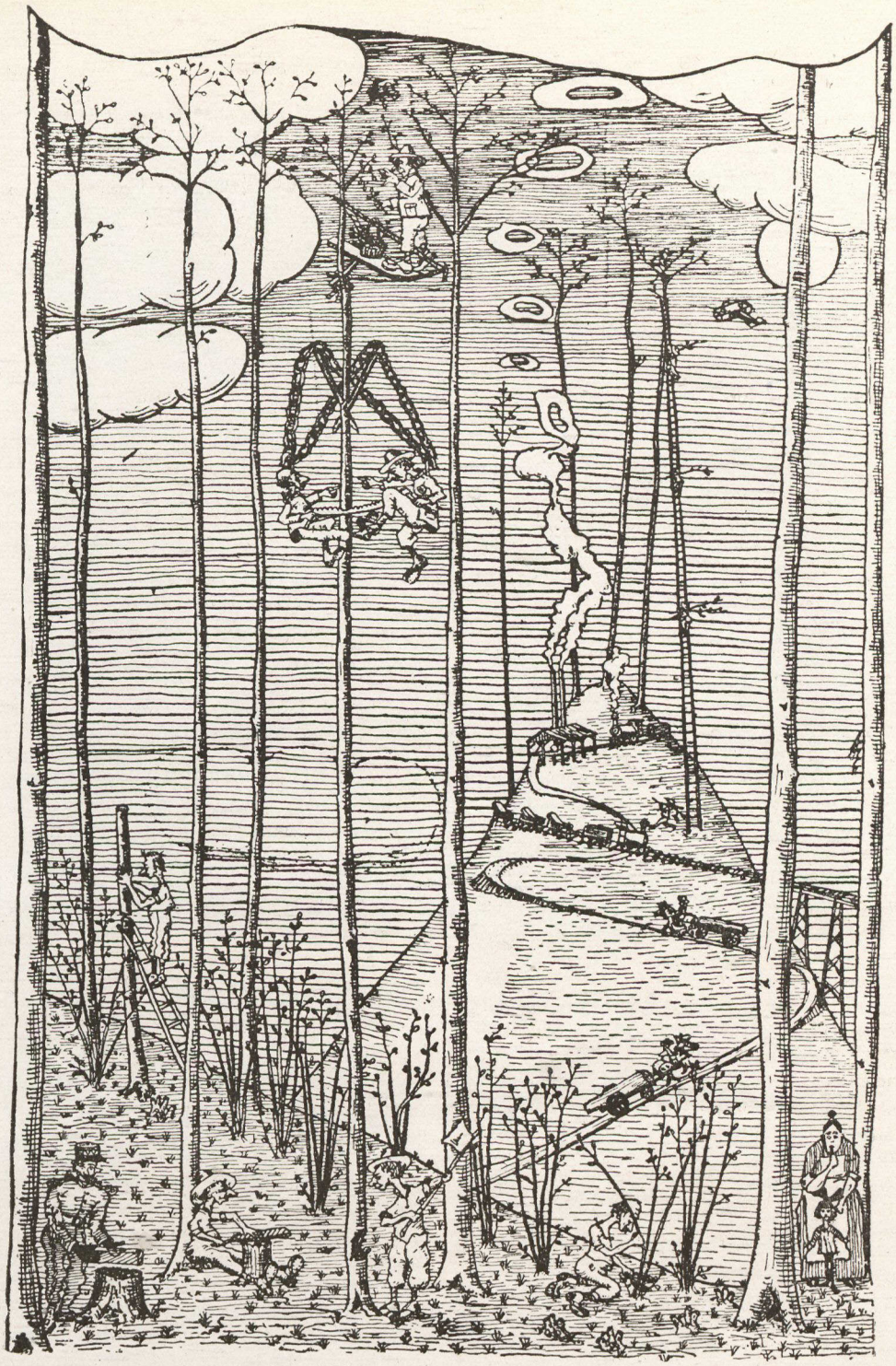
"An' yet some women set an' bawl
Because their man ain't got 'em all.

"I guess they ought to just be glad
We had the virtues that we had

"An' not be sad because us folks
Ain't tamaracks as well as oaks."

By Douglas Malloch.

A special article written for the Forestry Journal by Sir John Stirling-Maxwell, of Glasgow, noted champion of the forestry movement in the British Isles, appears in the February issue of the Canadian Forestry Journal.



Fun From the Forestry Camps.

The above cartoon is taken from a New Year Post Card received from Capt. L. M. Ellis, with the Canadian Forestry Corps in France. As a satire on French forestry and logging methods it is excellent. Note the three operations of cutting off the top, sawing the top log and chopping away the base—all going on at the same time, with a marvellous disregard of consequences. Lumbermen will appreciate the location of the sawmill at the top of the mountain and the long up-hill climb with the logs. To the left a French forester is placing a level on the butt to make sure that the sawing has been mathematically faultless. Tree planting also comes in for its share of attention.

OUR AEROPLANE WOOD RESERVE

British Columbia Production at Close of War Provided Material for 30,000 Planes.

The demands of the war have occasioned the most phenomenal development of many industries. Not the least among these is aeroplane lumber in British Columbia. This province, in the thirteen months since the first request came from the Imperial Government for this material, has provided approximately 9,000,000 feet of Douglas fir and 26,000,000 feet of Sitka spruce aeroplane lumber. This is sufficient wood for over 30,000 ordinary planes.

The output figures do not in themselves indicate the magnitude of the undertaking necessary to produce this material. In the first place, it must be remembered that wood for aeroplane construction must be of a special quality never before required in lumber specifications. It must be of the quality of a cabinet wood. The most important quality in aeroplane wood is straightness of grain on all four sides. Straight edge grained lumber can be produced easily by sawing parallel to the bark, but the prevailing tendency of trees to grow in more or less of a spiral form renders it difficult to secure lumber in which the fibres do not run diagonally across the flat grain faces. Very large amounts of perfectly clear sound lumber have had to be discarded on account of this spiral grain.

Spruce Hard to Reach.

In the second place, the spruce forests of the provinces are situated chiefly in the Queen Charlotte Islands and on the Northern mainland coast, several hundred miles from established lumber operations. The timber was largely owned privately, and cutting rights had to be secured, logging machinery, mills and labour had to be moved to these remote parts, and transportation facilities for logs, lumber and supplies established.

In order to secure the aeroplane material with as little delay as possible, the logging had to be done on a selective basis, only the clear straight grained spruce logs being cut. This naturally reduced the camp output of logs; but it increased the production of aeroplane material, as no time was wasted on inferior spruce or on the other species of timber.

When the operations commenced there were on the Queen Charlotte Islands three small sawmills at Massett Inlet and on the mainland pulp at Ocean Falls and Swanson Bay and a small sawmill at Georgetown, near Prince Rupert. The sawmills on Masset Inlet were put into commission and two new mills built. New plants were also constructed at Prince Rupert and Skeena City. Approximately three thousand men were employed on the work in the northern spruce forests.

The mainland mills were supplied largely with logs from the Queen Charlotte Islands. In order to transport the logs across Hecate Straits it was necessary to make them up into compact Davis rafts.

The placing of all contracts for logs and lumber was handled by the Imperial Munitions Board, under Major Austin C. Taylor, Director of the Department of Aeronautical Supplies.. The inspection of the lumber was done by the Aeronautical Inspection Department of the Imperial Ministry of Munitions, under Roland C. Craig, District Inspector. Forty examiners were employed in this department, and every piece of lumber was carefully inspected before being stamped for shipment. The requirements for aeroplane lumber are rigid. On the average it was possible to secure a recovery only of 20 per cent. from the selected logs.

During the thirteen months that operations were conducted the output was increased from 100,000 feet per month to 6,500,000 feet per month, and if the war had continued an even larger supply would have been secured.

Solid Trains of Lumber.

The lumber from the Queen Charlotte Islands and the northern mills was loaded on barges and towed to Prince Rupert, where the Grand Trunk Pacific Railway installed several cranes which transferred it to the cars. It was not an uncommon thing for solid trains of aeroplane lumber to be despatched from Prince Rupert. Owing to the urgency of the demand for this material it received preference over all other freight on both the railways and ships.

The Imperial authorities have tried all the known kinds of wood for aircraft and have found that Sitka spruce is far superior to any other. The quality of spruce growing in Northern British Columbia is undoubtedly the very best that can be secured. It is a well-established botanical fact that the farther north any plant can be grown successfully the better the quality, and this seems to be borne out in the case of Sitka spruce.

No Large Supplies Left.

Though the survey of the forest resources made by Roland D. Craig for the Commission of Conservation shows the amount of Sitka spruce as being estimated at fourteen billion feet, only a small proportion of this is suitable for aircraft construction; and besides, a large proportion of the aggregate is so scattered and mixed with other species that it cannot be logged separately on a commercial basis. In the Queen Charlotte Islands, however, there are large areas where the spruce exceeds thirty-five per cent. of the stand, and it is from these forests that the bulk of the output has been secured. It is estimated that the continuation of the cutting on a war basis would have practically exhausted the supply which could be secured at a reasonable expense of money and effort.

In view of this fact an effort should be made to conserve the remaining supplies of this timber. It cannot be replaced in centuries and it is doubtful if the succeeding growth will ever attain the same quality as this virgin spruce.

———o———

RANDOM

In Missouri the university forestry department is urging the farmers to raise walnut, which is much better than what the socialists in North Dakota are urging them to raise.

—*American Lumberman.*

A CAMPAIGN WITHOUT AN ARMISTICE!

Nineteen years ago on January 15th, the Canadian Forestry Association was born. At the annual meeting in 1901 the total membership was 244 and the total receipts $192.45.

On January 15th, 1919, the total membership is 8,000 and the total revenues $15,270.56. Total expenditures for 1918 were $14,340.65, leaving a balance for the 1919 campaigns of $929.91.

The Canadian Forestry Association has been advancing rapidly, even under the heavy handicaps of wartime. Since 1914, the membership has increased from 2900 to 8000, and the total revenues have gone up about three hundred per cent.

It cannot be emphasized too frequently that the Association is not identified with any government or commercial interests. While supported in a limited measure, financially, by the Governments of the Dominion, Ontario, Quebec, and New Brunswick, and by grants from public-spirited lumber and paper companies, it pursues a course in which the public interest is the one and only consideration.

Features of our 1918 campaigns were as follows:

Our Railway Exhibition Car, travelling through scores of back settlements in the areas of greatest forest fire hazard. Motion picture lectures given at each stop. Demonstrations of modern fire prevention methods given by a series of exhibits aboard the car.

6000 educational booklets written for and distributed in Saskatchewan, 6000 in Alberta, and 3000 in Manitoba.

10,000 copies of "Petit Catechisme de la foret" a primer for children, distributed in Quebec settlements. 10,000 copies of "The Child's Forest Book" placed in Northern Ontario.

Three issues of 5000 each of "Le Bulletin des Forets" circulated to the clergy and rangers of Quebec.

Fully 60,000 school children reached by Forestry Association educational stories through the teachers.

12,000 copies of "The Forests of Canada in Peace and War," sent to legislators and other public leaders.

3000 copies of "The Case for Nova Scotia's Forests," and 5000 copies "Nova Scotia's Stake in Forest Protection" placed in Nova Scotia.

10,000 copies of "A Partnership Offer" circulated in New Brunswick and Nova Scotia.

Five lecturers appearing under the Forestry Association's auspices held 120 public meetings between Spring and Fall. Two of above were provided by the Quebec Government and one by the Dominion Government.

A weekly service of lantern slide cartoons was provided for practically every motion picture theatre in the forested districts of the Dominion.

Motion pictures were similarly utilized to good effect.

Five school lecture sets were kept continually circulating between Boards of Education and Churches, reaching thousands of people.

Two special campaigns conducted with the governments of Alberta and Nova Scotia to secure improved protection of forests.

A Publicity Bureau reaching hundreds of Canadian newspapers. A vast amount of space has been devoted to forestry matters by the Canadian press in 1918.

The above comprise some of the more important activities of your Association during the past year.

One of the paramount considerations in the advancement of forest conservation is the development of the membership. We trust you will not suffer your own membership to lapse, and that you will score a new recruit for us during 1919.

The Canadian Forestry Association is a vital element in Canadian democracy. It has no selfish ends to serve. It is the instrument of intelligent citizenship, seeking to bring about sane administration of the forest resources. No Government possibly can perform this work; no commercial body would care to undertake it.

The responsibility and privilege of serving the future Canada in this way belong to YOU. There is no such thing as handling it by proxy.

—o—

You have a dollar.
I have a dollar.
We swap.
Now you have my dollar.
And I have yours.
We are not better off.
You have an dea.
I have an idea.
We swap.
Now you have two ideas.
And I have two ideas.
That's the difference.

—The Advertising News.

BRITAIN'S FORESTS AND NEW ENGLAND.

By E. C. Hirst, State Forester of New Hampshire.

Aroused by the exigencies of the war, Great Britain's reconstruction committee formulated a forest policy for the United Kingdom which was adopted before the armistice was signed and is now being organized. It provided for the requisition of land by the State for tree planting on a large scale, and by advances to private owners for tree planting on their own land on a profit sharing basis. By these means it is planned to build up home supplies of timber and the industries dependent on them. Can we learn a lesson from the experience of our ally?

It is certain that under the stimulus of war needs our pine mills have stripped over 35,000 acres in New England during the last two years, and probably over 100,000 have been cut over by all mills in the State. We can be proud of the fact that we were able so quickly to make available this large amount of New England lumber for the great cause which it served; but we must recognize the extent to which it has depleted our resources. To this end a broad policy should be worked out that will encourage the replanting of our cut over forest lands.

FRANCE'S POWER OF RESISTANCE.

An American lumberman serving in France has written the following most interesting tribute to the Forests of France in a letter to a friend:

"Over here the lumber business is good, especially the demand. If memory fails me not, in a conversation with you last winter, you mentioned that it was your understanding that they expected the forestry troops to get out about 20,000,000 feet a month, and you wondered where they were to get the timber to cut that much. Last month we cut 45,000,000 feet and we have orders for 100,000,000 feet a month for several months. Besides the lumber cut last month we made over 300,000 ties, 50,000 cords

of wood, thousands of pieces of piling, poles and posts, and some miscellaneous products. We have asked for several thousand more troops which are expected over soon. We now have seventy-five mills running day and night, and before spring we expect to have 100 more and to be make 100,000,000 feet a month. As for the available timber, it is here. About two weeks ago Maj. Kelly, now Lieut.-Col. Kelly, formerly of the Booth-Kelly Lumber Co., Portland, Ore., and I made an automobile trip to the Spanish border. We went down the western coast of France and returned through central France, inspecting several operations on the way. We went up the Pyrenees Mountains on mules to look over a tract of timber and the chances for logging. There were 100,000,000 feet in the one tract, all around one ravine or pocket. About two-thirds of this was in France and one-third in Spain. It was practically all beech, but there was a sprinkling of fir in it. Another tract looked over a short time ago had 500,000,000 feet in it. We are just starting to saw a tract of 50,000,000 feet of white oak, so you can readily realize there is a lot of timber in France. Besides our operations, the British have several operations and of course the French have, too.

TO REHABILITATE FRENCH FORESTS.

(Boston Transcript)

There is a fine sentiment in that gift of 3,000,000 pine seedlings that Pennsylvania is to send to France as a contribution toward the restoration of the war-riddled forests. This country is certainly indebted to the French nation for many things in connection with the war, not the least of which is the generosity with which she opened her highly prized forests that our armies might be supplied with the requisite timber for engineering works. Into those carefully tended woodlands our regiments of trained lumbermen moved, armed with all the up-to-date tools and machinery for the expeditious felling and sawing of the trees. Notwithstanding that this work was done under the guidance of French and American foresters and with as much regard for the future welfare of the forests as the circumstances would allow, the results must necessarily appear destructive to people so highly educated in the are of forest conservation.

Now that our forest regiments are to be withdrawn as rapidly as transport facilities will permit it will be the handsome thing for the United States to do what it can toward aiding in the repair of the damage that was permitted in its interest. There will still remain a million or more acres in northern France from which the axes and the guns of the enemy stripped the once thrifty forests and in the restoration of which Germany and her henchmen should be made to toil. What France really would be glad to have from this country in this reclamation work is not seedling trees, however good, but seed. This country has just now closed its own doors against foreign-grown nursery stock of all kinds in fear of the pestilence that the plants may carry. It would not be strange, therefore, if France felt a similar reluctance to accept our trees, not in retaliation for our prohibition but because of a justifiable dread of the possible consequences.

Seed, however, is clean and will be much in demand. Not unnaturally, though, the French foresters have their preferences in the matter of species and strangely enough from our point of view white pine from eastern America is not by any means a popular tree with them, not merely because it is subject to the blister rust but because its lumber commands a lower price in the market than even Scotch pine, regarded as inferior here. The acceptancy of Pennsylvania's gift is only another evidence of the traditional courtesy of the French people, who unquestionably appreciate the spirit in which it is made. Seed of some of our choicest species such as Douglas fir from the west coast and red oak from the east would be most welcome in large quantities, and the American Forestry Association at Washington has afforded an opportunity for all in this country who wish to bear a hand in the effort to make good the unavoidable wreckage by creating a fund for the collection and shipment of the seed.

G. A. GUTCHES TWICE PROMOTED.

G. A. Gutches, District Inspector of Forest Reserves (Dominion Forestry Branch) at Prince Albert, Sask., has received a substantial promotion by being appointed Superintendent of Government logging and sawmilling operations on Menominee Indian Reserve at Neopit, Wisconsin. Mr. Gutches will work under the immediate supervision of Mr. J. P. Kinney who is in charge, at Washington, of forestry work on Indian Reservations throughout the United States.

He was married on November 11th to Miss Alleen Armel Erb, daughter of Mr. and Mrs. G. W. Erb, of Winnipeg. Mr. and Mrs. Gutches are now at home at Neopit, Wis.

GUARDING THE MIGRATORY BIRDS.

The Dominion Parks Branch of the Department of the Interior has furnished the following data as to the aims and purposes of the Migratory Birds Convention Act, and as to the habits of the birds protected by the Act.

Last year a treaty between Canada and the United States for the protection of useful or harmless migratory birds, the first international treaty ever made in the interests of wild life conservation, was signed at Washington. Those seeking a solution of the problem of the protection of bird life on the continent of North America have for a long time realized that their object would best be reached by international treaty. As long as the matter was left in the hands of the various provinces and states of the two countries, birds protected in one part of the continent might be exposed to destruction, owing to the lack of protective laws, when they migrated to another part.

The Act passed by the Dominion Parliament sanctioning the treaty and providing legislation for its enforcement is known as the Migratory Birds Convention Act. It seems desirable to furnish the public with further information as to its objects. The general public should cooperate with game officers and peace officers to facilitate the strict carrying out of the regulations of the Act. The protection of bird life is of supreme importance.

Birds That Are Useful.

Insectivorous birds render a magnificent service by consuming insect species which if unchecked would soon multiply to vast hordes that would utterly destroy the forests and devastate the crops. Migratory game birds are of great value as a source of food and beneficial outdoor sport. In addition to their practical service, many birds are very important from esthetic point of view. The handsome plumage and vocal ability of many species add greatly to the beauty of nature and to the pleasure of the outdoors, and even the unmelodious and plain birds help to give character and animation to the open-air world. So much a part of our lives have the familiar birds grown that without them the world would seem to have lost much of its colour, light and interest. The uniform system of protection provided by the Act is a great step toward their preservation and encouragement, and the Act should have the enthusiastic support of every right-thinking citizen.

The economic service rendered by insectivorous migratory birds cannot be overestimated. There are few of us who fully appreciate this service. The fecundity of insect life is almost beyond belief, and tree and plant life in every stage of growth from the seed to maturity, is attacked by myriads of larvae and full-grown insects. If it were not for their persistent enemies, the birds, which devour vast numbers of eggs, larvae and perfect insects, the ravenous insect multitudes would spread desolation throughout the woods and fields. Without the constant help of the birds it would be impossible to protect crops and forests from the innumerable worms, caterpillars, beetles, borers, plant lice and larvae. The forests would not be long in existence but for the unceasing industry of the birds in the pursuit of insects, and protecting and encouraging the birds, and if possible increasing their numbers, is the most practical step that can be taken toward the preservation of the timberlands. All who appreciate the enormous value of the forests will realize the vast importance of bird protection.

For the protection of our forest trees we are particularly indebted to woodpeckers, nuthatches, creepers, titmice and warblers. There is hardly a crevice in the bark or a single leaf or stem that is overlooked by these birds in their tireless search for insect food, and every foot of ground and litter underneath the trees is minutely examined by the birds for hidden insects. It is of great interest that, to increase their efficiency, nature has assigned different work to the different species according to their habits and equipment, so that while some species with special organization for their tasks, pursue their prey on the trunks and larger limbs, others equipped for their particular work, hunt among the smaller branches and foliage.

In the past farmers and orchardists, as well as those to whom the smallest bird or animal is game, have destroyed large numbers of useful or harmless birds. The farmers and fruit growers did so under the impression that they were protecting their crops or fruit from the birds. Birds sometimes injure the crops of the farmer who in improving his land has cleared away the wild berry bushes and seed-bearing weeds, which provide the natural food of the birds, forcing them to feed upon the cultivated grain or fruit. But the little harm done by the birds, is infinitesimal, when compared with the

good they do. The aim of the Act, of course, is to protect the birds not only from those to whom all wild life is game, but from the farmer who owing to lack of knowledge of the habits of the birds, supposes that in killing them he is getting rid of pests.

Birds as Crop Savers.

Abundant evidence that cannot be questioned, to show the value of birds as crop savers, is available. Examination of bird stomachs by biologists of the United States Department of Agriculture showed that insects made up 100 per cent of the summer food of four common species of swallows, 100 per cent of the nighthawk's food, 98 per cent of the phoebe's, 94 per cent of that of the Baltimore Oriole, 98 per cent of the huse wren's, 80 per cent of the common crow's, 80 per cent of the kingbird's, 74 per cent of the meadowlark's, 68 per cent of the black-capped chickadee's, 80 per cent of that of four common species of woodpecker, 64 per cent of the brown thrasher's, 68 per cent of the bluebird's, 42 per cent of the robin's, and from one-half to one-third of the food of many other familiar species. This data was obtained from the examination of from over one thousand to not less than several hundred stomachs of each species. In winter, when insects disappear, many of the birds that remain during the cold weather consume large quantities of weed seeds, thus lessening the growth of noxious weeds during the following summer.

Mosquitos, flies, and others insects spread disease. The mosquito would be a much greater pest than it is but for nighthawks, whippoorwills, swallows, swifts, and flycatchers, which devour myriads of these troublesome insects. Ducks and other birds that inhabit ponds, lakes, and marshes consume enormous numbers of mosquito larvae. Flies are eaten by almost all species of birds.

Even Hawks and Crows.

Rats and field mice are a source of considerable damage to crops and stored grain, and frequently injure fruit trees by gnawing the bark from trunk and larger roots. Hawks, owls, and crows render a useful service by preying upon these rodents.

The Act establishes a continuous close season on the following migratory insectivorous birds: bobolinks, catbirds, chicadees, cuckoos, flickers, flycatchers, grosbeaks, humming birds, kinglets, martins, meadowlarks, nighthawks, nuthatches, orioles, robins, shrikes, swallows, swifts, tanagers, titmice, thrushes, vireos, warblers, waxwings, whippoorwills, woodpeckers and wrens, and all other perching birds which feed entirely or chiefly on insects. The Act provides that the close season on other migratory non-game birds shall continue throughout the year, except that Eskimos and Indians may take at any season auks, auklets, guillemots, murres, and puffins, and their eggs for food and their skins for clothing. Migratory game birds included in the terms of the Act are waterfowl, including brant, wild ducks, geese, and swans; cranes, including little brown, sandhill, and whooping cranes; rails, including coots, gallinules, sora, and other rails; shorebirds, including avocets, curlew, dowitchers, godwits, knots, oyster catchers, phalaropes, plovers, sandpipers, snipe, stilts, surf birds, turnstones, willet, woodcock, and yellowlegs; and pigeons, including doves and wild pigeons.

The Act provides that there shall be for the following migratory game birds: bandtailed next ten years a continuous close season on the pigeons, little brown, sandhill and whooping cranes, swans, curlew and all shorebirds (except the black-breasted and golden plover, Wilson or jack snipe woodcock and the greater and lesser yellowlegs), provided that during such ten years the close season on cranes, swans and curlew in the province of British Columbia shall be made by the proper authorities of that province within the general dates and limitations prescribed in the Act for the respective groups to which these birds belong.

Migratory non-game birds specified by the Act are: auks, aukets, bitterns, fumars, gannets, grebes, guillemots, gulls, herons, jaegers, loons, murres, petrels, puffins, shearwaters, and terns.

The taking of nests or eggs of any migratory bird, except under permit for scientific or propagating purposes, is prohibited.

ZEPPS. FOR FOREST SURVEYS.

The Forestry Journal aims to achieve a new standard of interest and value in its 1919 contents. An article by Flight Commander Barron, on the advantages of lighter-than-air machines—improved "Zeppelins"—in surveys and similar work will make bright reading.

Other special articles in the February number are from the pen of Sir John Stirling-Maxwell, of Glasgow; Hon. E. A. Smith, Minister of Lands, New Brunswick; and Dr. C. D. Howe of Toronto University Forest School.

Plenty of good illustrations, and a well-printed publication.

Lake Helena, at foot of Mt. Robson, British Columbia. Shoulder of Mt. Robson on right.

The Canadian Forestry Journal is usually liked by outdoors people. You can send it to a friend for an entire year for a dollar bill.

Ontario employed more than 1000 rangers in 1918 at a cost of about $500,000. Ontario has seventy million acres of forest land to guard against waste by fire.

Canada has the third largest forest supply in the world, Russia ranking first and the United States second.

THE EASY ROAD.

Some people like the prairie state
Without a hump or hollow,
With just a highway long an' straight
Across the world to follow,
With never not a hill to climb
Nor timber go a'trailin'—
With never nothin' all the time
But plain an' easy sailin.'

Up here the country's rather rough,
The roads are few an' narrow;
A man has got to be as tough
An' nimble as a sparrow.
There's rocks an' stones along the way
An' rivers to git over;
You see more thistles ev'ry day
Than ever any clover.

The roads of life are like the roads
Of earth, the way they vary;
An' some of us have got the loads,
An' some have none to carry.
Some thorofares are tempest-torn
An' others built of gravel—
For some to rocky roads are born,
An' some the smooth to travel.

The prairie road is level, wide,
An' mighty easy goin',
With painted signs on either side,
An' roses by it growin'.
The prairie highway hain't a tree
Or rock your courage testin';
An easy highway it must be—
An' darned uninterestin'.

DOUGLAS MALLOCH,
the "Lumberman's Poet."

7999 AND YOU

The Canadian Forestry Association is a union of progressive Canadians concerned in the preservation and proper utilization of the forest resources. The motive of national welfare predominates inasmuch as an overwhelming majority of the membership has not a penny of selfish interest in timber limits or wood-using industries. Conservation, as this Association has frequently emphasized, is Community Business. He who pretends to an interest in social advancement cannot well consent to the undermining of the material foundations beneath our national existence.

There are now 8000 Canadians within the membership of this Association. A clear addition of two thousand was obtained in 1918, largely through the loyalty of those who sought out recruits in their own neighborhoods.

Considering the hampering influences of war, the Association is making progress. The advance from 2900 members in 1914 to 8000 members in 1918 surely promises a splendid increase in days when the public mind is unclouded by the horrors of battle.

This month each member will receive two missives, one summing up what we have achieved in 1918, another giving the members a better perspective of their personal responsibility and privilege in a national cause which can be fought by the masses of people and by them alone.

Read both of these documents. They are brief and becomingly illustrated.

Then when the Association's memorandum of the dollar fee comes along (covering subscription to the Journal as well), you will probably feel fully content to stand by us through 1919.

Notice the improvement in this issue of the Forestry Journal—fine paper, fine illustrations, better articles. This will be improved upon exactly as the members manifest their loyalty by prompt payment of the small annual fee.

Our advertising revenue does not meet one-eighth of the cost of issuing this Journal. Our paper bill alone is more than $2200 annually, and when the price of engravnigs, printing, etc., is added to that, it will be found that the dollar fee does very little more than pay the cost of mechanical production.

Forest Protection Conference

WINDSOR HOTEL, MONTREAL, WEDNESDAY AND THURSDAY, JANUARY 29TH AND 30TH.

Continuing the series of successful public meetings of previous years, a Forest Protection Conference will be held at the Windsor Hotel, Montreal, commencing Wednesday morning, January 29th, and continuing until Thursday evening, under the auspices of the Quebec Forest Protective Association which includes the St. Maurice, Laurentian, and Southern St. Lawrence Forest Protective Associations.

The Canadian Forestry Association, co-operating with the foregoing, is organizing a public meeting for Wednesday afternoon, January 29th, at which such speakers as F. J. Campbell, President Canadian Pulp & Paper Association; W. G. Power, President Canadian Lumbermen's Association; Brig.-Gen. J. B. White; Major Barrington Moore (New York); and Hon. W. R. Brown, will discuss subjects of popular interest.

At the Thursday session of the Quebec Forest Protective Association, Lieut. Lewis will describe Aerial Photography.

"Lumbering in Scotland" will prove a most interesting address from Mr. E. C. Hirst, State Forester of New Hampshire, who recently returned from Overseas.

Mr. J. W. Swaine, who has charge of forest insect investigations for the Department of Agriculture, will tell of the importance of slash disposal in affording protection from insects.

There will also be a talk on the use of tractors in woods operations, and an address on aeroplane work in forest protection.

Meetings of the Woodlands Section of the Canadian Pulp and Paper Association, and the Canadian Society of Forest Engineers, have also been arranged.

New Motion Pictures will be shown.

The meetings last year were splendidly attended. This year's programmes will hold your attention every minute.

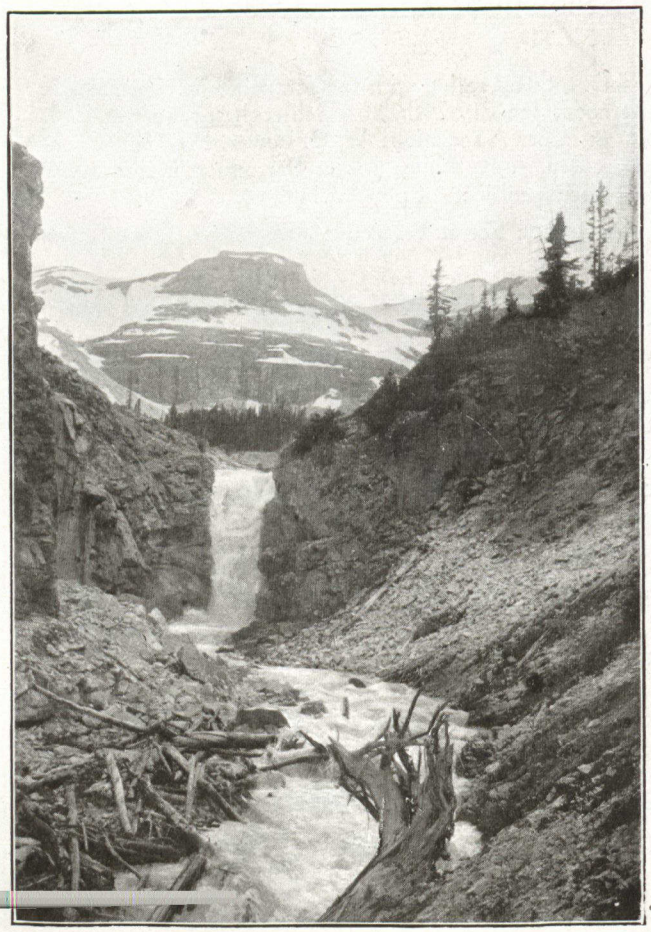
Keep the dates open and come along!

WEDNESDAY AND THURSDAY JANUARY 29th AND 30th, 1919.

TO POOL IDEAS FOR FIRE PROTECTION BETTERMENTS.

An excellent suggestion for the pooling of helpful ideas in connection with many branches of forest protection work was made at the last meeting of the forest protective associations in Montreal and during December was put into effect by the forming of a special committee with Mr. J. B. Harkin, Commissioner of Dominion Parks as Chairman, and H. C. Johnson of the Board of Railway Commissioners as Secretary. This committee will be widely representative of the government and private forest protective systems and of the Commission of Conservation, Canadian Forestry Association and other bodies having an interest in this work.

It has long been realized that no clearing house facilities existed whereby individuals having constructive suggestions or with the results of actual experiments, can co-operate and advise with other individuals or organizations engaged in forest guarding. This applies not only to the field of mechanical appliances, etc., but forest protection publicity. The need of this auxiliary channel has been felt by many of those having to do with the practical end of forest protection during the past several years. Meetings will be held periodically and it is anticipated that much advantage to fire prevention efforts throughout the Dominion will result.



Little Yoho Valley Falls, Yoho Park, B.C.