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# CANADIAN FORESTRY

## MAGAZINE



A SELF-RENEWING "GOLD MINE"—THE HEART OF A BRITISH COLUMBIA TIMBER STAND

# AIRCRAFT FOR FORESTRY SERVICE

## AIRPLANES USED SUCCESSFULLY IN FOREST SERVICE

### Firefighters Carried To Scene of Blaze and Prevent Spread of Flames.

PRINCE RUPERT, B. C., April 17.—“Fire on the Nechako river!” The words came distinctly out of the air. “Where?” asked a watcher at the forest patrol station near Prince George. The word whirred off into the sky. Traveling on aerial vibrations it shot across the forests. Thirty miles away another station caught it. “Forty-two miles south-by-east of Stuart lake,” was the answer returned out of the void of space.

#### PROMPT ON SCENE.

An airplane rose swiftly from the Prince George station. Under full power it skimmed through the sunlit silence over the wilderness of spruce and fir. Far off the three men in the fuselage spied a cloud of smoke boiling up from the horizon. Straight as the flight of an arrow they steered for it. Twenty minutes after the alarm was sounded they were on the ground fighting in the red track of the flames.

Before a strong wind the conflagration might have turned a hundred leagues of evergreen woodland into a black desert crowded with the gaunt skeletons of charred trees. The timely arrival of the fire fighters confined its destructive sweep to the compass of a few square miles.

Possibly a million dollars worth of good timber had been saved by the wireless telephone and the airplane.

More than this had been saved. The farm homes of settlers have transformed the Nechako and Bulkley valleys along the Grand Trunk Pacific railway into garden spots. Thriving villages dot the region. Lumbering camps and sawmills are numerous.

All these would have been wiped out if the flames had not been stopped in mid-career.

Government statistics show that 390,000 acres of British Columbia forests were destroyed by fire in 1920. This represents a loss of 236,000,000 feet of timber, valued at \$299,000. The damage to young growth is estimated at \$486,000, making a total loss of \$485,000.

Of the year's fires 345 or 28 per cent were put out before they had spread over a quarter of an acre and 391 or 31 per cent were extinguished before they had covered ten acres. The effectiveness of fire fighting under modern methods has greatly reduced losses as compared with former years.

We have had quite a little experience in the development of planes for use over forest areas—and would welcome the opportunity of discussing this experience with you and possibly adapting the use of airplanes in the solution of your problems.

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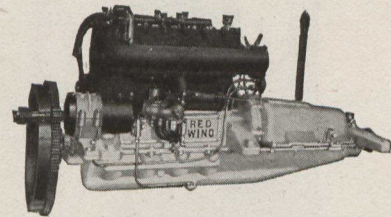
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THE  
ILLUSTRATED  
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No. 8

## The Aeroplane's Service to Forestry

A Record of Actual Tests in Fire Detection, Survey of Wind Damage, and Cutting Costs of Fire Fighting.

By Major L. A. Andrews, Regional Forester, Vancouver.

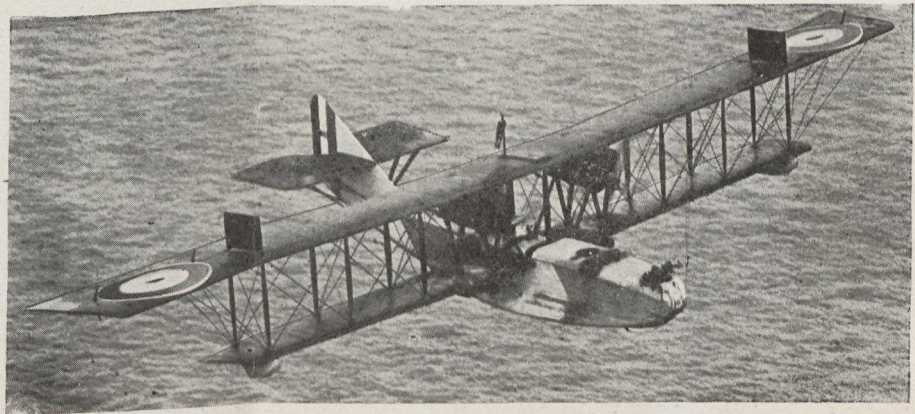
Commercial flying has made rapid and permanent advancement during the past few years. Types of machines have evolved from those suitable for War purposes stripped to the bone for speed, weight-carrying or fighting to those more suitable for passenger and freight transportation and the latest machines are models of comfort and luxury.

The safety factor in construction is not now sacrificed for other consideration and reasonably priced insurance is easily procured in the Old Country, where travel by air has become well established. At the present time over fifteen different lines operate daily out of London and Paris on published time tables, fog being the only element of uncertainty or danger. Accidents are very few and the risk is little greater than by boat, train or motor.

The short period of joy riding on unsuitable types of machines which followed the termination of the War and gave flying a black eye for a time has passed. Flying is now done to accomplish certain definite objects to obtain accurate information quickly and to travel more expeditiously.

Flying on the Pacific Coast has followed the general trend and is now carried on in a sane businesslike basis. The Seaplane base established last year by the Air Board for the development of civil flying has undertaken and carried out a large amount of work covering a wide field. One of the principal uses of Government work carried out on this coast has been flying in connection with Forest work.

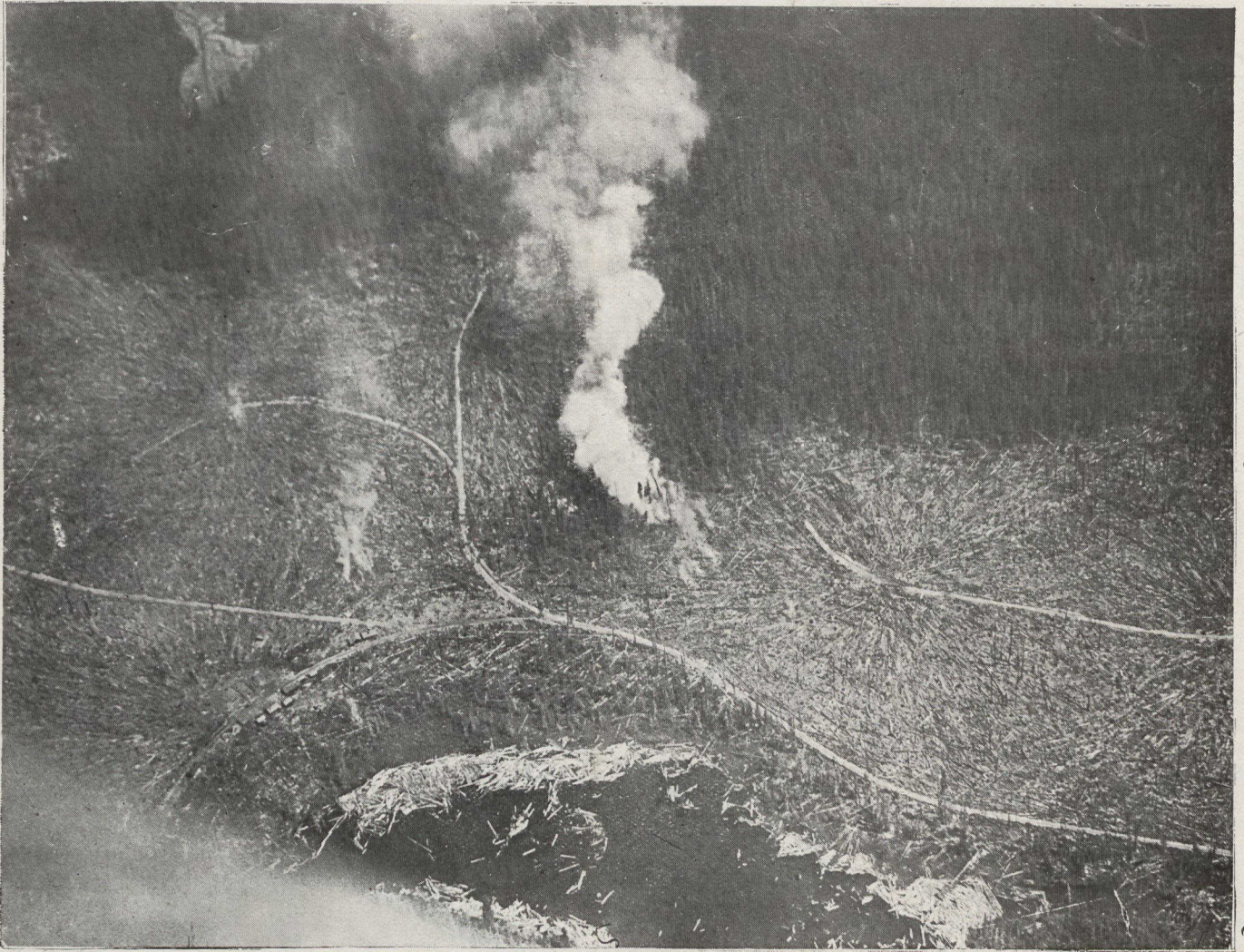
Before going into the subject, however, I wish to express a few words in appreciation of the efforts of Major MacLaurin who is in charge of Government flying operations in British Columbia. The efficiency with which his flying station at Jericho Beach was established and gear assembled for flying is generally recog-



Photographed in flight. An F-3 Flying Boat, with two Rolls Royce 360 h.p. engines. This machine can carry a fire fighting party of twelve men with necessary equipment.



Unloading Supplies carried by air to fire fighters near Roberval, P.Q.



The first stage of a developing forest fire in British Columbia as seen by aeroplane. Photograph by courtesy Dominion Air Board. See opposite page.

nized as well as the sane businesslike methods on which operations have been conducted.

There have been no accidents to any of his machines. There have been no failures to get to any place set out for, and the Major has been on the job all the time to co-operate in every way possible with the various departments with which he has to deal. The successes of the past season have been largely due to his personal supervision and a great deal of the actual piloting has been carried out by himself. I am told that machines from this station have flown over 30,000 miles this year.

A Seaplane base was established with the object of developing Civil Flying, in 1919, at Jericho Beach, Vancouver. The special work to be undertaken included inspection trips for the Federal Customs Department to check smuggling and check dope traffic, inspection and supervision of coastal fishing industry for the Fishery Department to enforce the regulations, co-operation with the Dominion and Provincial Departments for geodetic survey, water reconnaissance, forest work and other departmental field activities.

In describing plans, results and con-

clusions on the use of aeroplanes for forest work, a short outline of the general forest problems is necessary and in this I have to confine myself to the Vancouver Forest District.

This particular Forest district extends from the International Boundary north to Cape Caution on the Mainland, including the Fraser Valley as far east as Hope and the Mainland Coast Inland to the Height of Land of the Coast Range. It includes the whole of Vancouver Island. There is approximately twenty million acres of territory within these boundaries. The stand of commercial timber in this district is estimated at 172 billion feet Board Measure, or about one-half the total estimated stand for the whole Province, according to the Reports of the Commission of Conservation.

#### Forest Problems.

Protection of this timber resource is naturally the first consideration of the Forest Service. Administration of the Forest Laws and the everyday conducting of the Department's business comes next because the Government has a real equity in every acre and every foot of standing timber, the money for which is collected

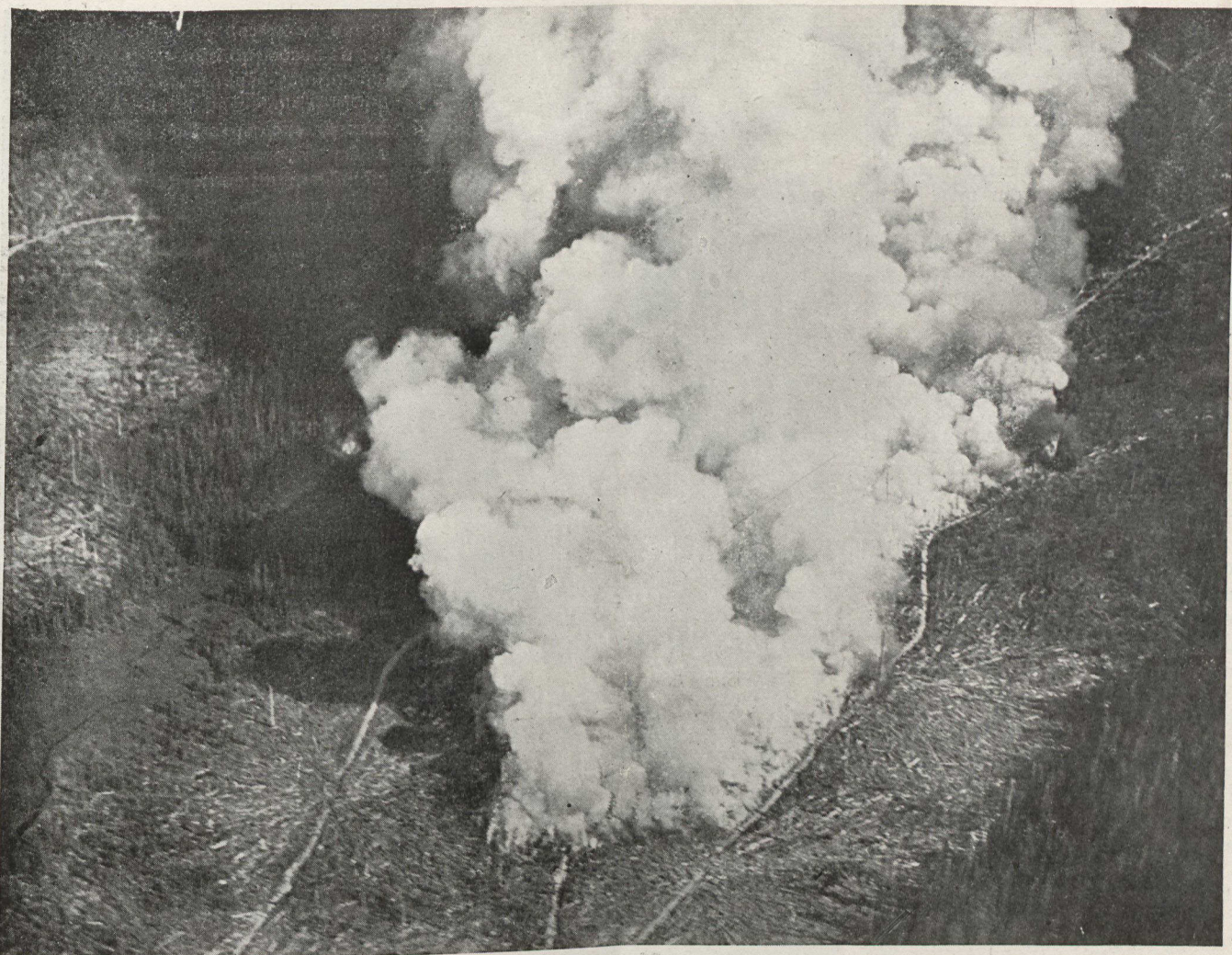
annually as the timber is cut. Concern for the future is the third big problem which requires research and investigation into actual growing conditions for the replacement of what is cut.

#### Organization.

The following organization is maintained. A headquarters staff located at Vancouver is in direct charge. Spread over the district are four Supervisors, nineteen permanent Rangers and twenty-one Scalers. During the Fire Season twenty-eight Assistant Rangers, twenty-two Patrolmen and fifty Honorary Fire Wardens are employed. For the transportation of this staff twenty-five launches are in use, nineteen Ford Cars and three Speeders, and a small number of saddle horses.

#### Fire Protection.

The fire hazard in this district is usually of about five months duration in the Summer. Some 50,000 acres of new slash are created annually from the cutting of 1 billion feet of timber. Some 800 to 1,000 logging camps employing 10 or 12,000 men are operating in the timber using 350 to 375 steam donkeys and locomotive engines. Pre-emptors clearing land,



Gaining new power every minute! This Photograph well illustrates the power of the sea-plane scout to observe and report on the progress of a forest conflagration.

campers and travellers attracted by the good roads and fine climate, lightning and various other causes start from 300 to 1,000 fires each year resulting in an annual loss of hundreds of thousands of dollars.

In efficiently handling the fire situation, quick detection, quick and reliable communication and quick transportation are essential. All fires are small at first. Every delay in getting to them increases the difficulties of control and directly increases the cost. To a large extent the solution of the problem therefore depends on the development of communication and transportation facilities, as well as a steady development and increase in the use of mechanical equipment, such as portable fire fighting pumps, cars, boats, tools and aeroplanes.

The supervision of this field staff also is a matter of serious concern. One-half the force on fire protection are temporary employees, and being spread over such a large territory, control is a difficult matter.

The use of Aeroplanes on this phase of the work was, therefore, considered to be of great importance.

#### Administration.

The general administration or carrying

on of daily business includes the supervision and inspection by the Field Staff of 250 small timber sales monthly, inspection of 800 to 1,000 logging operations quarterly and inspection of 900 to 1,000 pre-emptions yearly. In addition the cruising of 50,000 acres of timberland and the examination and classification of 20,000 acres of forest land is carried on annually. One hundred million feet of timber is scaled monthly. Supervision of export, building of improvements, are some of the other activities. The supervision of this work is a big task scattered over so much country which is difficult or slow of access and the use of aeroplanes was considered feasible, and was one of the big reasons for advocating their trial on this Coast.

#### What can be Seen from the Air.

To a trained observer the ground from any height is an open book as far as the general physical features of the country go. With his map on which the name of places, islands, inlets, etc. are marked, he can locate his position absolutely at any moment. If his map be accurate and of a reasonably large scale, he can read the ground in perspective, and roads, trails, railroads, towns, farms, blocks of

timber slashings, etc., take on a new meaning by reason of this. In the final analysis his map is just the accurate diagram of what he sees, and while survey lines may not be actually seen, their approximate location on the ground is apparent in relation to the configuration of the ground. For example, he can pick out a 40 acre plot with absolute accuracy by following a shore line, or the junction of two creeks or the intersection of railway lines, roads or trails or its proximity to a hill or pond or island, which stand out clear and plain as on a diagram.

With experience he is able to pick out small objects which may hardly register on the eye as evinced during the War, when the most careful camouflage of a gun pit or ammunition dump was spotted.

It is more a fact that the human mind is not able to retain a tithe of what is actually seen than that not enough can be seen. For this reason in order to justify the expense of flying for reconnaissance purposes, photography must be employed largely to record the information obtained.

The reading of aerial photographs is an exact science and requires a highly trained specialist.

How often did the poor Pilot in France come in with a set of pictures only to be

sent out next day to a grind of artillery observation to shell a dump or guns, the existence of which he had only the merest suspicion but which were actually plotted on his map from the photographs. The actual depths of trenches, height of obstacles were measured in many instances and the actual inch contour maps made of tides and depths around Zebbrugge and Ostend, which were compiled by the Naval Air Service before the Zebbrugge show. These are concrete examples of the exact nature of what is possible.

#### Survey of Forests.

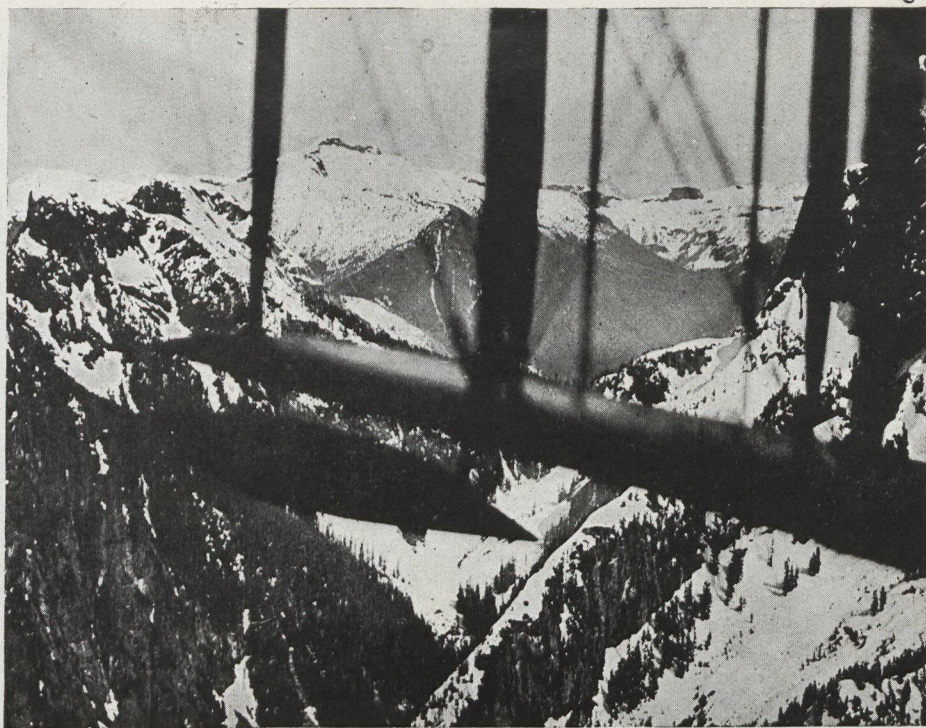
Many problems still remain to be solved before accurate survey of any considerable area of ground can be done by aerial photography. Owing to the varying height of the camera and, therefore, varying focal length, at the time the pictures are snapped due to uneven air currents, a variable unknown is introduced into the plotting from a mosaic composed of many separate plates, also owing to a warping of the plane in which the pictures are taken due to tilting of the machine while the plates are being snapped.

However, for extensive reconnoissance the aeroplane presents many valuable features. Large areas of country can be covered at low costs and in quick time. In the case of timberland, the information as to percentage of species, density of stand, size of timber, topography suitability of the tract for logging, general classification into types, etc. **is there** on the photograph if it can be read. Accurate cruising, however, is doubtful as the factor of quality and defect, unless the stands and types are uniform and the percentage defect and quality is known. Where the stands are fairly uniform as in the cedar type around Drury Inlet, species stand out very clearly and the percentage of cedar is easily determined. In this connection an experiment has been carried out to obtain a basis for work of this kind. An area of over 2,000 acres which had been recently cruised was photographed from the air. The cruise was conducted on the 20 per cent caliper method and special time and effort made to include all possible detail. The aerial photographs will be tied into this topographic map and a basis for reading timber from aerial photographs worked out.

An incident occurred while this work was going on, which was interesting to note. On the first flight over the area it was noted that an additional area of 390 acres was apparently vacant Crown Land and should have been included within the boundaries of this 2,000 acre sale. This was checked up on the ground and subsequently cruised adding to the original sale about nine million feet of timber.

#### Flying Plans for 1921.

Under the co-operative agreement between the Dominion Air Board and the



Patrolling the timber areas of the Rocky Mountains with Major MacLaurin.



A good example of the unobstructed view obtainable from a flying machine. Forest fires up to a distance of 50 miles have been "spotted" and reported to headquarters.

Department of Lands, a portion of the 200 hours covered by the Government's commitment to the support of flying was allotted to this district. This was divided between the various branches of our work after deducting about 10 per cent of flying time available for training of our personnel, to get them used to air work and on preliminary investigations.

#### Forest Protection.

Fifty (50%) per cent of the total flying hours available was set aside for Forest Protection work. A system of bi-

weekly patrols was lined up for the months of July and August.

Patrols were to be carried out on Wednesdays and Sundays. Each trip to consist of a circuit from the Vancouver base following the Mainland Coast and diverting inland to get a view of the heads of the various deep inlets north to Bute Inlet, landing at Thurston Bay repair station. The return trip south following the East Coast of Vancouver Island returning across the Gulf from as far south as Saanich Inlet.



# Have You a Shade Tree Needing Repairs?

Practical Instructions for the Amateur Tree Owner. How to Remove Decayed Limbs and Restore Wounds in Trunks.

By B. R. Morton, B.Sc.F., Dominion Forestry Branch, Ottawa.

## Removing Branches.

In tree repair work it often becomes necessary to remove certain branches. All small dead or decaying branches should be cut off, since it is through them that the decay may spread to the healthy limbs and trunk. In the case of very large limbs showing evidence of decay, their removal will depend on the extent of the decay and the degree to which the tree will be disfigured by the removal. If the decayed area is extensive and the loss of the limb will not be particularly noticed, it will be simpler to cut off the decayed portion or even the whole limb rather than attempt to restore it. When only a portion of the limb is removed, the cut should be made far enough away from the decayed area to be through sound healthy wood (Fig. 1). In removing an entire branch, large or small, it is important to make the cut close to the base or shoulder of the branch and that the plane of the scar be nearly parallel to the axis of the limb or trunk from which it developed.

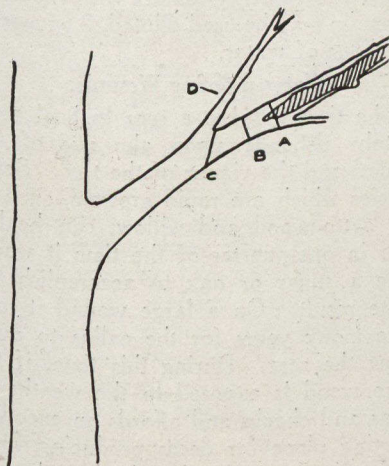


Fig. 1.—In removing a decayed portion of a limb to cut should if possible be made at some point as indicated at C immediately in front of a vigorous young branch D. If the cut is made at A it will not remove all the decay, and if made at B it will leave a projecting stub which will be slow to heal.

If the cut is not so made a projecting stub remains, which is not only unsightly but a source of danger to the tree. Stubs heal very slowly. Often they do not heal at all since they receive little or no food. The leaves which would ordinarily have manufactured the food for this portion, were removed with the portion cut off. Such stubs, therefore, dry out, die, and through them the decay producing fungi get a start. When the cut is made properly at the shoulder of the branch (Fig. 4), there is a better chance for the new growth to develop and cover the wound.



Fig. 3.—Showing injury by stripping bark due to attempting to remove limb with single cut.

When removing a branch care must be taken to avoid causing an unnecessary large wound by splitting. If one were to make a single cut as shown in Fig. 2, the weight of the limb might cause it to split near the end of the cut and serious injury would be caused by the stripping of the bark. There is no special difficulty in removing the small light branches where the weight can be supported with the hand, but in the case of the heavier limbs extra precaution must be taken. One of the best methods of removing a heavy limb is indicated in Fig. 4. Begin by

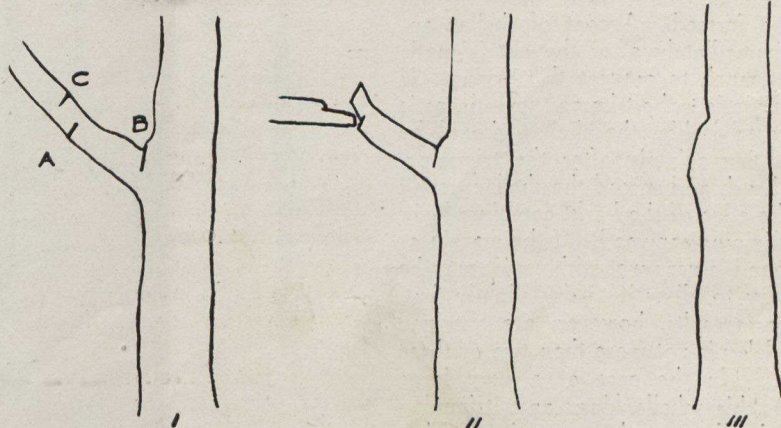


Fig. 4.—Method of removing a heavy limb. Make first cut half way through at (A) on the underside. Make second cut about half way through at (B). Make third cut at (C) until limb drops. First cut (B) and remove stub.

making an under cut about half-way through at 'A' about 10 or 12 inches from the shoulder. Make the next cut close to the shoulder and saw half-way through as shown at "B." Remove the saw and make the third cut on top at "C" a little beyond the under cut "A." Continue this until the limb drops off. Then finish cut "B" and support the stub while doing so.

It might be stated here that the immediate return of vigour and apparent new lease on life that is shown by an old tree



Fig. 2.—A single cut through a heavy branch may strip the bark. Avoid this by making cuts as shown in Fig. 4.

after having been repaired is due more often to the pruning it has received than from any other repairs.

## Treatment of Wounds.

All wounds, whether they are caused accidentally or the result of repair work, should receive treatment immediately after they occur. Promptness facilitates the healing and in many cases reduces the

size of the wound and consequently extensive treatment later.

There are four operations in treating wounds: (1) trimming, (2) shellacking, (3) sterilizing, (4) waterproofing.

#### Trimming Wounds.

In the case of freshly made wounds, the border of the wound is frequently left in a ragged condition by the saw or other tool used. To facilitate the formation of the callus or new growth by the cambium, it is advisable to trim the margin smooth with a sharp knife. Wounds which are somewhat square or broadly rounded in shape at the upper and lower edges will in many cases heal more rapidly if they have been slightly pointed, as indicated in Fig. No. 5a. The shape of the wound affects the rate at which the cambium can form a new growth over it. Wounds with their longer diameter parallel to the axis of the trunk or limb will heal more rapidly than those which have it at right angles to the axis, since new wood is formed more abundantly on the side of the wound where the greatest flow of food passes, (Fig. 3). This fact should be borne in mind whenever making an opening in a tree to remove any decayed portion as will be described later in these articles.

In the case of large irregular wounds such as frequently result from accidents, as the scraping of wheel hubs against the trunk or the biting of horses, all ragged projecting tongues of bark should be cut off and the margin trimmed smooth with a sharp knife, somewhat after the manner indicated in Fig. 6. In the case of old wounds of the kind where there is evidence of a new growth forming, this trimming may not be necessary. All dead projecting strips of bark, however, may be removed.

#### Shellacking Wounds.

When a cut is made through healthy fresh bark and wood, the cambium layer about the margin will usually dry out and as a result, die back from a small distance under the bark. As far as possible this should be prevented, for it simply means a large area over which a new growth must be formed. A coat of shellac applied immediately after the cut is made will do much to prevent this drying. If the margin is to be trimmed smooth, as is usually advisable, the shellac should be applied immediately after the trimming. Use a brush and spread the shellac gently over the edge of the bark, cambium layer and adjoining sapwood. If the margin of the wound is very wet with sap it may be necessary to allow it to dry slightly first. The best results, however, are obtained if the delay is not more than two or three minutes. In the case of a very large wound this shellacking and trimming should be done at the same time. That is, trim only a small portion at a time and immediately apply the shellac, and after

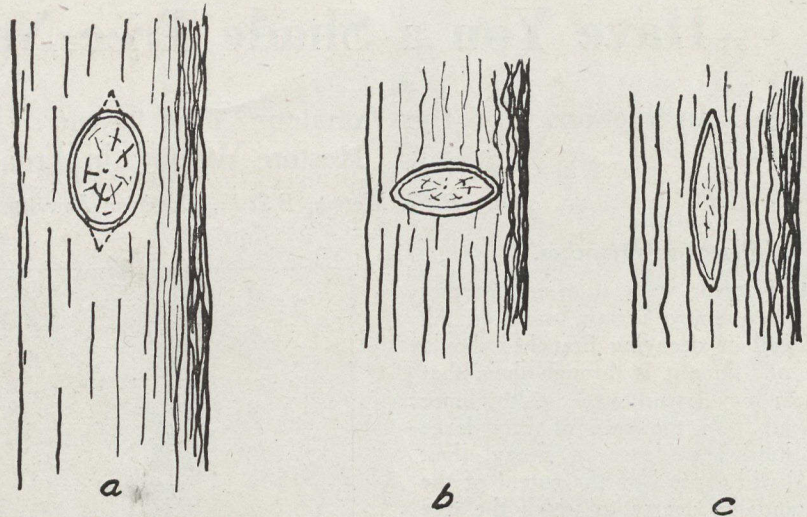


Fig. 5.—Wounds with their longer diameter parallel to the axis of the trunk or limb (c) will heal more rapidly than those which are at right angles (b). Slightly pointing broadly rounded wounds as indicated at (a) will assist the healing.

this fashion gradually work around the whole margin. This method will prevent any portion drying while the remainder is being trimmed.

#### Disinfecting Wounds.

After a wound has been trimmed and shellaced, the next step is to disinfect the surface so that any spores of decay producing fungi which may have become lodged on it, will be destroyed. There are several materials which may be used for this purpose. They include creosote, copper sulphate, (blue stone), bi-chloride of mercury and formalin. Creosote, the product derived from the distillation of coal tar and which can be purchased from many paint dealers, is perhaps the most widely used. It should be applied with a brush over the entire surface of the wound. It is very penetrating and therefore some tree repairers object to its use near the margin of the wounds because of the danger of its killing the cambium.

On large surfaces, however, it can be applied without much danger. If there is any fear of this injury, a copper sulphate solution made of one pound of copper sulphate to 3 gallons of water may be used. Or else, use the bi-chloride of mercury solution in the proportions of 2 ounces to 15 gallons of water, or a 7 grain tablet to a pint. The bichloride of mercury is exceedingly poisonous if taken internally. Also it is a corrosive agent and should not be kept in a metal retainer or allowed to come in contact with the skin. Formalin may be used diluted, 2 ounces in 2 gallons of water.

#### Water-proofing Wounds.

The time it takes a scar to heal completely depends upon the size of the wound and the vigour of the tree. Some species which are rapid growers, such as the cottonwood and willow, can heal a scar in one-quarter of the time it would take a sugar or oak to accomplish the same result. On a large wound it may take many years for the callus to overgrow the scar. During this time, if the bare wood is exposed to the weather it dries and checks and affords an excellent starting place for decay-producing fungi and an entrance for boring insects. The disinfecting solution is not a permanent dressing and cannot be depended upon to keep such pests from gaining an entrance through the cracks formed by the checking. It, therefore, becomes necessary to apply some kind of a more permanent nature. On small pruning wounds, not over half an inch in diameter, the new growth may be so rapid that water-proofing is unnecessary, but on large wounds it should always be done.

The materials most commonly used for this water-proofing coat include paint, asphalt and liquid grafting-wax.

A good quality of paint made of pure white lead and linseed oil makes a satisfactory coat for small wounds which will heal rapidly, and where the surface is

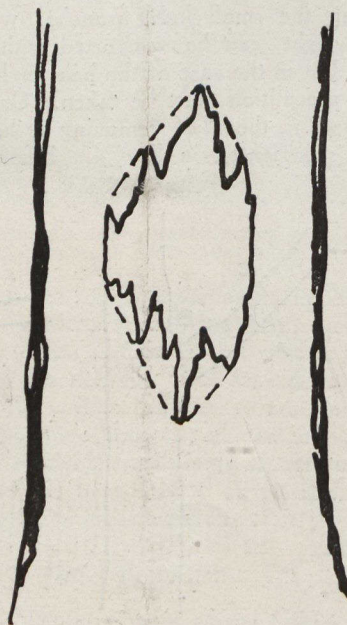


Fig. 6.—Ragged bark wounds should be trimmed as indicated by the dotted lines as soon as possible after the injury is received and treated as described in text.

(Continued on page 458.)

## A Successful Tamarack Plantation in Saskatchewan

So little is known of the possibilities of native trees when grown in plantations that this record of growth of Tamarack is of value. The eastern Tamarack has not appeared extensively in the lumber market because of the almost complete destruction of the mature timber by the sawfly, about thirty years ago. A young forest has sprung up quite widely over its original range and by its growth promises to produce merchantable timber at an early date. Tamarack is the hardest and heaviest of the northeastern coniferous timbers.

This plantation of 6.8 acres was established in 1908 at Walseley, Sask., by the Forestry Branch of the Canadian Pacific Railway, from native Tamarack stock obtained from a muskeg near Molson, Manitoba. The stock was about six years old when collected, and was planted three feet apart in rows four feet apart. The object of close planting was to get an early cover on the sandy loam soil.

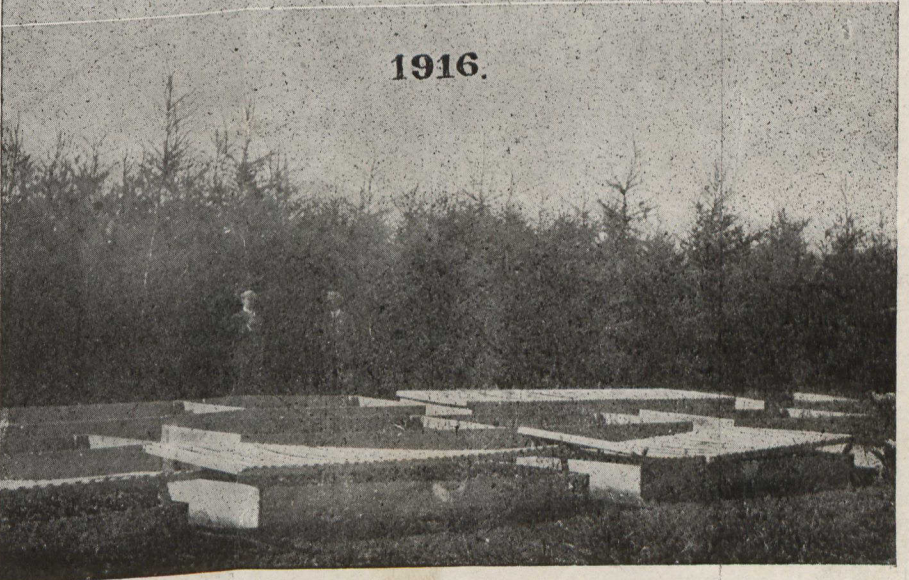
After the close of the growing season in 1914, one hundred and ten average trees were measured and tagged. They were remeasured in 1915 and again early in 1921 before the current year's growth had taken place. Ten trees showed broken tops, and nine others were dead or could not be located in 1921.

The average of 99 trees in 1914 shows a height of 12 feet and a breast-high diameter of 2.26 inches. The average height of these same trees six years later is 18.5 feet with an average diameter, breast high, of 3.33 inches. This gives a diameter growth of one inch in 5.6 years and an annual height growth of 1.08 feet. The total volume of the average tree in 1914 was .193 cubic feet and .553 cubic feet in 1921.

Computation of volume growth for the complete plantation is made difficult by uncertainty in the record of the number per acre. The crowns of the trees have closed and were crowding to an extent that made a thinning necessary in 1921.

Trees in this plantation may be expected to make a greater annual height growth in the immediate future than that shown by the measurements.

This species has thus far made a satisfactory growth, and has established a cover over the soil which will check the loss of water by evaporation from the soil. Later measurements will doubtless show an equally satisfactory volume growth of wood per acre.



## Helping the Prairie Settler With his Tree Problems

The Tree Planting Car of the Canadian Forestry Association with Messrs. Archibald Mitchell and Angus Cooch in charge drew into Moosejaw early in October to close the Tree Planting Campaign on the Prairies for 1921. Last year this unique enterprise attracted something over 10,000 people to the lectures and the demonstrations. This year the total number of prairie settlers and townspeople attending the lectures, and demonstrations, or seeking consultations with Mr. Mitchell, reached 48,676.

With the exception of \$1,000 donated to the Tree Planting Campaign by the Saskatchewan Government, the remainder of the money was contributed by a small group of agricultural and private individuals and mercantile companies in the Western provinces, to whose generosity in a discouraging business year the progress of the Tree Planting Campaign is due.

In the following narrative, Mr. Angus Cooch, who assisted Mr. Mitchell in the campaign, describes in an intimate manner the types of Western citizens encountered and the difficulties and encouragements that lie ahead of the prairie tree planter.

"First of all we have the man who has a fine plantation around his home grounds. A successful tree planter! He is eager for more information, listens attentively to the lectures and during the discussion period asks questions freely. Has a fine place himself, is proud of it, and not afraid to tell the whole countryside, if necessary. This is the ideal type; a few in every district and it would not be long before a great change would come over the present landscape of telegraph poles and barbed wire.

"Then we have the unfortunate man who planted trees and had them die on him. He comes to the lecture firmly in the belief that trees won't grow on the prairies but on proving to him through stereopticon views of well treed prairie homes that trees can be grown almost anywhere, he wants to know why he failed.

"The causes of failure are numerous, but the chief one without a doubt, is the lack of information the average western farmer has had on this subject in past years. He has been doing his best under the circumstances, working without information or local inspiration, and going purely on the natural instinct of one who was brought up in a treed country. Unfortunately for this pioneer, his efforts in many cases are doomed from the outset as his lack of knowledge of local conditions and general information on prairie forestry, is too big a handicap to surmount.



The women of the Prairie Farms are taking hold of the tree planting cause. The scene shows 120 women in the Lecture Car of the Canadian Forestry Association.

"Trees won't grow," he says. We ask him why? and find out during the discussion that the land wasn't properly prepared; the mixture of the plantation was poor; the wrong varieties were used; he was importing his trees from Ontario or the United States where they had been grown in a lower altitude and different growing conditions; planting was slack; trees too far apart in the plantation; or he had allowed the grass to get the stronghold while the trees were in their infancy. These points were all thoroughly discussed with him, reasons given for everything and his own particular problem or failure sifted right through to the bottom. "If I had only known this when I first started to plant," he would say, "But, I'll start again and this time it will be in the right direction." Thus another convert was secured, and one, who with his newfound confidence in Tree Planting is ready to join the ranks of successful planters.

"Then we have the pessimist, he, who has'nt got bush around his place, never planted a tree in his life, never tried and is positive they won't grow on the prairie. "Why" he says, "if the Lord meant trees to grow on the prairies, why wasn't the country covered with trees when I came here." We ask this man if he has any wheat on his farm, and if so, did he find it growing there when he first came to the country? We then explain to him that the Lord is rapidly putting the trees back on the prairie and draw his attention to the Aspen Poplar bluffs increasing every year on all sides of the prairies. Then we tell him about all the successful plantations, show him the pictures, of places growing right on the bare bald prairie and if we can't convince him at that we at

least feel as if he has got enough information to start him thinking ultimately in the right direction. Fortunately the Westerner is an optimist and the pessimistic breed are few and far between; the country has no welcome for men with blue goggles.

"For a certainty, the Tree Planting Car has been of mammoth service in advising thousands of settlers with regard to cause of failures and discouragement and in encouraging planters to carry on, as well as those who have never planted to put their new inspiration into action. A tremendous increase in planting cannot be expected right away; that depends on so many different conditions, but good missionary work has been done and there is no doubt more men are thinking of tree planting and putting new projects under way than ever before.

The supply of trees for reforestation on the Dominion forest reserves was obtained largely from the nursery stations at Indian Head and Sutherland, Saskatchewan, but, in order to develop such work on the forest reserves convenient to the places where the planting is to be done and in order to give training in forest nursery and forest planting work to the staffs on reserves where planting is necessary, small nurseries have been started on several of the reserves. These reserve nurseries will not be increased to large dimensions, so as to be general sources of supply, but will be developed to serve the full requirements of the reserves on which they are situated.—Annual Report, Director of Forestry, Ottawa.

# Wireless Telephony a Success in Forest Protection

By R. V. Stuart, B.C. Forest Protection Service, Vancouver.

Previous to 1920, the Forest Service of British Columbia had considerable mileage of ordinary pole and tree telephone line which was tied to the lines owned by various telephone companies of the Dominion Government. Communications were fairly good except on the lower coast where patrol is chiefly by water. Here the men on the launches were always more or less out of touch with headquarters. During the war we heard reports from time to time of the success attained in wireless telephony, and it seemed that if it could be adopted to meet our requirements, it would be an ideal system of communication for the Coast which, on account of the deep indentation, renders ordinary telephone construction difficult and costly.

Arrangements were made with the Marconi Wireless Telegraph Company and other companies for a series of tests in the spring of 1920, and as a result, a contract was given to the Marconi Company to erect three land stations, and to equip five of our patrol launches. The land stations are located at the Court House, Vancouver; Myrtle Point, about 75 miles north of Vancouver, and at the Forest Service Marine Repair Station at Thurston Bay about 130 miles north of Vancouver. This year an additional launch was equipped making six launch units in all.

The land station installations consist of a one-half kilo-watt valve unit set, both

transmitting and receiving gear is contained in a lockup cabinet, similar in appearance but of smaller dimensions than an ordinary piano case. Power to operate the set can be taken from the regular city power supply or it can be engine driven. In Vancouver we use power obtained from a 7½ kilowatt motor generator set in the Court House. At Myrtle Point, a 6 H.P. Heavy Marine Engine supplies the necessary power and at Thurston Bay the unit is driven by a small hydro-electric installation. The land stations have an average range of 80 miles, although it is frequently as high as 125 miles, according to atmospheric condition.

The equipment installed on the launches consist of 100 watt transmitting and receiving set having a range of 50 miles, and is arranged in compact cabinet form weighing only 100 lbs. The launch sets are operated by friction drive direct from the fly-wheel of the launch engine. The shore stations are in charge of certificated wireless operators, but the launch sets are operated entirely by Forest officials. The Marconi Company keep an engineer in the field continuously inspecting and adjusting the sets, and although the service obtained in 1920 was a long way from being perfect this year far exceeded our expectations.

All units were closed down last winter and we re-opened them on April 1st, this year. The Marconi Company gave us the

benefit of any improvements brought out in wireless telephony, and consequently the sets this year have many improvements over last year. Since re-opening in April the system has worked very smoothly. Over two thousand recorded messages have been transmitted to date and in addition to this, there has been, of course, a great amount of unrecorded business between the district office and field officers. We have found the wireless phone simply invaluable this year, and as a result of its installation on our launches and up coast points, have been able to get daily reports in every phase of Forest Service business and have received prompt and comprehensive reports on all fires. In fact, we have been able to keep in close touch all through the season with all forest officers connected with it. In previous years large fires have occurred in the territory served by the wireless, and owing to lack of adequate communications, have burned for days before we got any reliable reports regarding them. We therefore found it a great help this year to be able to communicate directly several times a day, if necessary, with officials in charge of fires in this territory.

We still have periods of poor service but wireless telephony with us has left the experimental stage far behind. We now consider it indispensable on the Coast, and plan to extend it.

## Are Planted Forests Justified by Eventual Costs?

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

"Do you know how much pulpwood is left in the United States?" "Neither does anyone else. No one knows how soon the peak of production will be reached and production begin to decline. In this respect the pulp industry is in the embarrassing position of a merchant who does not know his total assets."

The above is the opening paragraph of a most important bulletin just issued by the United States Forest Service in cooperation with the American Pulp and Paper Association, and since any discussion of the pulp and paper situation and the necessity of reforestation for Canada must take into account the situation in the United States, these words have a very vital importance for us. To summarize the timber situation in the United States briefly, New England was once self-supporting in the matter of timber, now

### MR. WILSON'S ESTIMATE OF THE STANDING TIMBER DERIVED FROM PLANTED FORESTS.

White Spruce: \$2.29 per cord.

Poplar: \$1.23 per cord.

Norway Spruce: \$9.50 per cord.

Jack Pine: \$4.75 per cord.

These calculations take cognizance of the cost of stock, planting, administration, but do not allow for the cost of land. Note Mr. Wilson's argument as to interest charges.

it must import nearly all that it requires for every purpose, and its pulpwood supplies, it is said, will be exhausted in ten to fifteen years. The Middle States, especially Pennsylvania, once exported

timber, now they are large importers; the Lake States once supplied the world with white pine, and now have hardly a stick left, and they have a most acute situation in regard to their cut-over lands;

the South for years has been a very large exporter and now, it is credibly believed, has only twenty years more supply at the present rate of consumption. The last great stand of virgin timber is in the Northwest, which still exports largely. Alaska is beginning to be drawn on for pulpwood. The Eastern paper and pulp mills are already drawing largely on Eastern Canada for pulpwood, over a million cords annually are now being exported, besides large quantities of pulp and paper representing very large quantities of pulpwood. The Canadian exports have risen fifty per cent in ten years and the home consumption three-hundred-and-forty per cent. The consumption of pulpwood in the United States has risen since 1890 over twelve hundred per cent. These figures go to show that the pulp and paper industry is one of basic importance and one which will continue to grow at a rapid rate. Not only must it increase with an increase in population, but also as new uses are found for its products. Not to mention the many new uses for paper such as furniture, rugs, water pipe and twine, we are just at the beginning of the age of containers of every kind made of paper, and of a large textile industry which will use pulp in ever increasing quantities. All these things will make for the stability and increasing prosperity of the industry.

#### Timber Holdings Enhanced.

The increase in the use of wood pulp and its products will naturally increase the price of pulp wood. Loss from forest fires and insects will also tend to diminish the supply and raise the price. As the virgin supplies near at hand are cut off, the decreasing accessibility and increasing freight rates will prove an important factor, and the increase in Government stumpage dues and ground rents will also play a minor part.

In view of all these things, freehold timber lands and limits will increase in value at a continually increasing rate, and those individuals and firms who own such lands or leases will have an asset rapidly more valuable.

Any prophecy as to the future value of pulpwood is difficult owing to the number of factors which enter into any calculation, and also our ignorance of future developments. We have, however, the experience of centuries in Europe, records being in existence dating back to 1300 and earlier. We also have the experience on this continent. It is absolutely certain that in spite of the development of substitutes, wood consumption continues to increase with population and industrial development. We have, as an example, the increase of the prices of wood in Saxony from 1850 to 1890 from \$5.04 per cord to \$13.95 per cord. The export price on square white pine from Canada has risen from 1850 to 1894 from 5½ cents per cubic foot to 42 cents, or approximately 18 per cent per annum. The

price of pulpwood in the United States, delivered at the mill, has risen from 1899 to 1920 from \$4.99 per cord to \$19.03, or 282 per cent. The rise from 1915 to 1920 shows a very rapid rate, from \$8.75 to \$19.03. Even if we take only the rate from 1899 to 1915, the price in 1921 will be \$22. If we take only the average of the rate from 1899 to 1920, the price will be \$37.50, and owing to the continually increasing rate of consumption is likely to be far higher than this.

All of which goes to show that the man who holds pulp and paper stocks might do well to think twice before he parts with them on account of a temporary set back to the readjustment after the war. Just at present many new mills have been built and the capacity of others increased, but the consumption will very rapidly catch up to them, and there is a very decided limit to the number of new mills which can be built, as cheap water power and wood are absolutely essential, and power sites are limited in number and timberlands on this continent have pretty well passed into the hands of large owners who are not likely to part with them.

#### Replacement Must Commence.

In the United States the question of supply of pulpwood is so acute that they are trying to force Canada to export her raw wood from Crown Lands, a policy which would be foolish and fatal to our industries. The supply in Canada is not adequate for our own needs, indefinitely, in fact we can now practically set the date when the peak of our own production will be reached, and if we will take warning from the experience of Europe and the United States, we must take steps to replace our virgin forests which will become exhausted. Practically speaking, it will take fifty years to establish new forests by planting, and an even longer period to go back to our cut-over lands for a second crop which will be less than half of the first crop if the forest is left to nature to replenish. Therefore it is high time that we decided to begin. The first question asked is what will planting cost.

#### The Cost of Planting.

Mr. J. K. Johnson, of the Great Southern Lumber Co., in an address delivered before the Southern Forestry Congress, said, "Usually about the first thing a hard headed lumberman will ask is, what does it cost? Well, I'll say this much, it costs all right, and one of the things we are trying to learn is how to keep the cost down to the minimum. But in the consideration of the question, through and through, I believe we will all finally have to admit that it costs too much NOT TO PRACTISE FORESTRY."

The writer believes that the time has come when, in order to maintain our industries, we **must** begin to plant trees.

The longer planting is put off, the more it will cost and the longer will be the trying time between the exhaustion of our virgin supplies and the availability of planted ones. The only difficulty in determining the price of planted trees is a purely theoretical one. Shall we charge compound interest on the money spent in planting, and if so, at what rate. Most people now are charging off depletion on wood cut on timber lands, and if this amount, instead of being charged off, could be spent in planting, it might somewhat reconcile those who object. The long time element in planting, the constantly increasing value of the capital invested, the sure rise in value of timber, and the security of the investment, all demand a low rate of interest, and the best authorities place this rate at three to three and one-half per cent. Let us take the rate, however, at six per cent. The cost of the land does not enter into the calculation, as the land remains as an asset and will probably have increased in value by the time we are ready to cut the trees. The total cost of planting, an average from the costs of many firms who have tried it, be somewhat reduced. The cost of fire protection can be taken at ½ cent per acre, administration and taxes in Quebec at two and one-half cents per acre. Poplar will yield forty cords in twenty years, jack pine twenty-five cords in thirty-five years, Norway spruce thirty cords in fifty years, and white spruce thirty cords in forty years. This would give us a cost per cord, at the end of the above periods, of Poplar \$1.23, Jack Pine \$4.75, Norway Spruce \$9.50, and White Spruce \$5.29. It must also be borne in mind that when this timber is planted it will be in the neighbourhood of the mills, that transportation costs will be very much reduced both for the delivery of the wood and for the provisions and equipment needed in the cutting. That large wood piles would not be needed to provide for emergencies, as the wood can come directly from the stump to the mill, thus reducing the capital invested in wood piles and the insurance on them. Logging costs will be materially reduced as the stands per acre will be five times heavier, permitting concentrated operations and the employment of power saws for cutting down, and machinery for loading and hauling. Lumbering operations can continue all the year round, giving employment to permanent populations. Fire protection will be much cheaper on account of smaller areas, and the use of fire fighting apparatus and the greater interest of the people in fire protection. The mill which starts planting operations now will, at the end of its period of rotation, the time of its first cut, be in a wonderful position compared to the mills which will be bringing their supplies by barge from the north shore of the St. Lawrence 500 miles, or from the Hudson Bay region or Northern Ontario 200 or 300 miles by rail.

# An Open Forum for British Columbia Problems

Hearty Public Response apparent at the Provincial Forestry Convention held at Vancouver and Victoria by the Canadian Forestry Association.

The British Columbia Forestry Convention organized by the Canadian Forestry Association was held at Vancouver on Monday, September 19th, and continued at Victoria the following day. In point of attendance, both meetings resulted most favorably. The subjects on the programme held close relation to the economic interests of British Columbia and were handled by the speakers with great fidelity and directness. Indeed each speaker took his responsibility with such seriousness as to make the papers of permanent value to all concerned in the basic problems of the natural resources, their maintenance and industrial development. In addition to the wide publicity already given in the newspapers of British Columbia, the lumber and other trade papers will use the addresses in full and special articles will be made from them and circulated through the Canadian Forestry Association to the Saturday editions of newspapers in many parts of Canada. Many of the addresses of general interest will be used in the Canadian Forestry Magazine, several appearing in this issue. Due to the substantial concession of the C.P.R. hotels, the convention rooms at the Hotel Vancouver and Empress Hotel, Victoria, were placed at the Association's disposal. Mr. C. E. E. Ussher, President of the Association was chairman at all sessions.

The Convention, it is anticipated, will have far reaching consequences as concerns the extension of the Canadian Forestry Association's influence in British Columbia. The Association, of course, in all parts of Canada is inspired solely by a desire to place at the disposal of the various provinces its facilities and experience in educational propaganda. Public service along the lines of forest conservation as well as development of tree planting on the bare prairies is the dominating reason for the Association's existence. The Association has deepened its hold upon the public confidence only by demonstrating its value in the national welfare.

As the Association's experience broadened, the original limited zone of influence has been extended until today every part of Canada is feeling the beneficial influences of its educational work, particularly in forest fire prevention. The prairie provinces are well taken care of, as concerns the promotion of tree planting, by a distinct enterprise supported by philanthropists of the middle west and the Government of Saskatchewan.



"Big stuff" as our Pacific Coast understands it.

Now arises an opportunity, and an urgent duty, to make the Association as valuable to British Columbia as it has undoubtedly been to other parts of the country. To join hands with the people and Government and forest industries of British Columbia to develop public co-operation in the prevention of forest fires and in the better understanding of other problems of forestry will be made a matter of study and negotiation within the early future.

The programme of the Convention was as follows:

## VANCOUVER PROGRAMME.

MONDAY, SEPTEMBER 19th

Address of Welcome by the Mayor of Vancouver.

The Trend of the Timber Situation:  
(a) On the Pacific Coast: P. L. Lyford, Vancouver.

(b) In the Middle West: R. D. Prettie, Superintendent of Forestry, C.P.R., Calgary.

The Outlook for the Pulp and Paper Industry in Eastern Canada:

Paper prepared by A. L. Dawe, Secretary, Canadian Pulp and Paper Association. Read by A. E. Mc-

Master, Secretary - Treasurer, Whalen Pulp and Paper Mills, Limited.

Lumber Export in Relation to Forest Problems:

H. R. MacMillan, H. R. MacMillan Timber Export Co.

Industry Organization:

W. B. W. Armstrong, Secretary, B. C. Loggers' Association.

The Motor Truck in Logging:

F. S. Buck, Deep Cove Logging Co.

Problems of the Shingle Industries:

Fred. H. Lamar, Secretary, Shingle Agency of B.C.

Some Phases of the Red Cedar Shingle Industry:

C. J. Culter, Westminster Mills Co.

## VICTORIA PROGRAMME.

TUESDAY, SEPTEMBER 20th.

Address of Welcome by G. R. Naden, Deputy Minister of Lands.

Manufacturing for Export:

J. O. Cameron, Cameron Lumber Co., Victoria.

Forest Research in the West:

P. Z. Caverhill, Provincial Forester of B.C.

## Forest Research in the East:

T. W. Dwight, Assistant Dominion Director of Forestry. Paper read by Mr. S. R. Cameron.

## Keeping British Columbia Free from Fire:

C. S. Cowan, Assistant Provincial Forester.

## Extension of Markets for Forest Products:

Loren L. Brown, B.C. Lumber Commissioner, Toronto.

## Forest Work by Aeroplane:

Major L. A. Andrews, Regional Forester, Vancouver.

## Mechanical Improvements in Fire Fighting:

R. V. Stuart, B.C. Forest Service.

## Depreciation by Forest Insects:

Ralph Hopping, Provincial Entomologist, Vernon, B.C.

## Grazing on Forest Land:

T. P. McKenzie, Grazing Commissioner, Victoria. Paper read by G. R. Naden.

### A WESTERN TRIBUTE TO THE FORESTRY CONVENTION.

From the "Western Lumberman," of Vancouver: "Addresses and paper of an extremely practical nature were presented at the two-day convention under the auspices of the Canadian Forestry Association, held at Vancouver on Sept. 19th and Victoria, Sept. 20th. While all of the subjects dealt with had an important bearing on the question of forestry in Canada, very many of them were strictly of industrial and commercial phases of the timber and lumber industry. A gratifyingly large attendance marked both days of the convention, and the very keen interest displayed was manifest throughout the sessions. The series of motion picture films depicting various phases of timber operation, etc., and the lantern slides used to illustrate some of the addresses of more technical nature, were a very great assistance to both speakers and audience in following the subjects under discussion."

tion, and from the very start there would be a new market provided for from twenty to thirty thousand carloads of lumber as well as hundreds of cars of all classes of merchandise.

"Our country from one end to the other is overbuilt, in everything except homes and farms. Your money and my money is invested in these non-revenue and non-productive things, or in this over capacity. There is no gainsaying the fact that what this country needs is agricultural population. Every farm consumes on the average two thousand feet of lumber per annum. What the average farm means by way of market to other lines of industry is extremely important to the internal commerce of the country. The lumber manufacturer cannot increase his production, neither can the steel and iron, cement or woollen manufacturer because there is no market for these goods at present. The only thing the world needs greatly is foodstuffs, principally grains. This is the only product for which it will pay."

Mr. Prettie demonstrated effectively how the trend of the timber industry in America was steadily and inevitably westward, due primarily to the comparative exhaustion of the virgin timber tracts. As an example, he showed that in 1850 the northeastern States produced 54 per cent of the total of American lumber, and in 1918 had fallen down to 7 per cent. During the same period, the cut on the Pacific Coast had advanced from 4 to over 25 per cent. Just thirteen years ago British Columbia produced 19 per cent of the total lumber cut in Canada, whereas today this province is responsible for 36 per cent. Within a decade, said the speaker, the centre of the Canadian lumber industry will have shifted to British Columbia.

Mr. Prettie put forward a strong argument that with the overseas market apathetic, the United States market partly blocked by a tariff wall, the obvious course for Canadian business men to pursue is to create a greater home market by the process of building up agriculture through selected immigration and the transfer of potential farmers from the workless cities to workable land.

## Put Idle Men on Farms and Solve Depression

That an enormous stimulus would be given to the lumber and other industries throughout Canada by a carefully planned extension of the Soldier Settlement Board scheme to establish the workless men of the cities as producing farmers, was one of the most important notes struck at the Canadian Forestry Association at Vancouver, September 19th, by Mr. R. D. Prettie, Superintendent of Forestry of the Canadian Pacific Railway at Calgary. "A large part of the unemployed" said Mr. Prettie, "were born and brought up in the rural districts and from one cause and another have drifted into the cities. One cause, perhaps, is that these people never had a chance to own their farms. Would

not be better to extend to them a chance to be producers on the land, rather than to put them to work on some public undertakings of which the country is in no immediate need? The speaker said that up to May 31st last the Soldier's Settlement Board had placed 26,000 men and families on farms, the maximum loan being eight thousand dollars each with interest payments amply taking care of the public advances. The failures under this scheme to date were less than five per cent.

"The placing of twenty to thirty thousand families a year on the vacant lands of this country would cost Canada from 80 to 100 millions per annum, but it would be a first class investment. You would receive interest on the outlay, you would have an added tax paying popula-

## Old Man Ryland Says:

"Some folk pays dey bills wid cash, some wid checks, and some wid reluctance."

Every reader of these lines is a Member of the Canadian Forestry Association, a subscriber to this Magazine.

Most of the members regard their annual subscription of two dollars as a pleasant obligation. They pay it promptly. They realize that the bone and sinew of the Association's field enterprises is the Membership and that there is little meaning in Membership unless a man pays the carrying costs.

Please bear in mind that the total of all membership fees just pays for the printing and paper of the Canadian Forestry Magazine. There ought to be a surplus from the fees for educational work, and the habit of "putting it off" when our accounts are rendered is the one stumbling block in the way of such a surplus.

### A GOOD MANITOBA FRIEND.

From A. M. Shields, Virden, Man.—  
"I enclose \$2.00 membership and magazine subscription for my friend Mr. Shannon. Please send him the September number.

"I am deeply interested in the great work being done by the Canadian Forestry Association and on more than one occasion have spoken and written with the view especially of persuading the farmers of this community to plant trees more and to make wind breaks, etc. With best wishes.



# Keeping British Columbia Free From Fire

By C. D. Cowan, Assistant Chief Forester of British Columbia.

Among the many tasks that the Provincial Forest Branch has to undertake, is that of fire prevention and suppression. The immensity of this work is accentuated by difficulties of transportation, communication, lack of trails and telephones, and still further, a scattered population.

In order to make the best of existing facilities and to co-ordinate them into a real organization, the problem resolves itself into two principal divisions, that of education of the public in fire prevention, and organization of all available suppression forces.

To deal with the former, I will briefly outline the programme that the Department has adopted and with, we believe, some measure of success.

At the beginning of each fire season, or to be more precise, early in April, posters are sent out outlining the Forest Fire Law, particularizing the necessity for:

(a) Obtaining permit to burn slash during the close season, May 1st to October 1st.

(b) The necessity for operators to be fully equipped with fire preventative and suppression appliances, before operations can continue during the close season.

(c) Warnings to campers and travellers are posted.

Railway patrols are also organized, acting in co-operation with the Board of Railway Commissioners at Ottawa. During the months of June, July and August, the newspapers throughout the Province carry the advertisements of the Department advising caution with fire in the woods.

In this regard I must voice the thanks of the Forest Branch for the way in which



A Fire Patrol Boat on Harrison Lake, B.C.

the press of the province has rallied to our aid, never losing an opportunity of spreading the gospel of forest protection. Such news items are not, and in the financial nature of things, cannot be paid for by the Department, but are printed by the press to carry forward a public duty which they have not been slow to recognize.

In connection with the propaganda outlined, the Department has felt that, having regard for the publicity given the forest protection during the past few years, that any breach of the fire laws must be deliberate, and prosecution follows in almost every known case of such flouting of the law, and convictions gained in practically all cases brought.

This attitude is simply the carrying out of a definite programme, and as a general rule the person who violates the Fire Law gets but scant sympathy from the community in which he resides.

## Control of Operators.

Before the fire season opens every operator in the Province is visited, and served with written notice as to whether his fire appliances conform with the regulations or not, what tools they are short of, etc.

New regulations were put into force at the beginning of the present season, regulations which entailed an additional expense to every operator, and I am very glad to say that not only were such regulations well received by the logging fraternity, but proved their worth on many occasions.

Railway patrols are also organized, rights-of-way brushed where necessary, debris burned and section crews organized for fire-fighting purposes.

Between April 1st and May 1st, the temporary six months men are appointed, and are firstly engaged on trail work, either maintenance of existing trails or cutting out new ones, repairing or constructing telephone lines, overhauling tools, and mechanical appliances and posting fire notices. After May 1st the time of these men is taken up partly on issuing Fire Permits and partly on other organization work.

This organization to which I have just referred is the realization of the value of systemizing all available fire-fighting forces, material or human.

Therefore, the Department demands that at the beginning of each season, every field officer shall prepare a list of men with their addresses who have been requested, and have consented, to act, in



Small end of large Douglas Fir log at Ruskin, B.C.

case of necessity as foremen, time keepers, straw bosses, gasoline men for the pumps that are used, and fire-fighters. This means that there is, at the time of a fire, no question as to pay, to duties to be performed or as to where men can be obtained.

Grocery stores are supplied with grub lists, based on the maintenance of one man for one day, so that supplies can be ordered for any number of men for any number of days, doing away with the chances of arriving at the scene of a fire camp minus salt, coffee, or some other necessary article.

Another result of this organization of suppression forces is that when men are being canvassed for fire fighting crews, the gospel of Forest Protection must, of necessity be preached, and thus we gain more converts to the cause.

#### Everybody's Business To-day.

But it is well known that in all cases of Forest Fires, the initial action taken to get them out is of vital importance. Thus in previous years, fires would be seen when small, but it "was the job of the Forest Ranger to put it out." In other words, it was nobody's business, which allowed the fire to reach such proportions that it became a costly business to put it out. To meet this situation, men who

are selected as trustworthy and reliable citizens have been appointed Honorary Patrolmen, with supervision over territory in their immediate neighbourhood. Their job is to collect a crew immediately a smoke is reported, sending word to the nearest Forest Officer of what they are doing, and jump on the fire while it is small. During the fire season, many of our officials may be attending to fires in isolated valleys and therefore out of touch with a telephone for days at a time, so that the value of this force can be readily appreciated.

The results which have attended this organization leave little room for doubt as to its efficiency; I know personally of several cases where such prompt action has resulted in putting out fires while small, which might very easily have reached alarming proportions.

The improvement in the organization of fire suppression forces has naturally led us to improve, or to adopt improvements, in fire fighting methods.

The Department is also building up trails, tapping the timbered valleys, connecting up existing trails, establishing tool caches, burning dangerous fire hazards, seeing that debris around camps, donkeys and rights-of-way are disposed of, crews in logging camps organized, and generally doing our very best to keep Forest Pro-

tection in British Columbia a live issue, to be kept in mind not only during the danger period, but at all times of the year.

#### Winning the Public.

For the tourist we have built camp sites, near wood, water and shelter, we have appealed in every possible way to the public to keep the forests green, not only from an economic, but from a scenic point of view. We have shown by articles in the Press, and we have shown pictorially, the results that follow in the wake of forest fires, the dry creeks during the summer drought, the floods that follow heavy spring rains when there is no forest cover to hold the moisture back, we have shown that a depleted payroll follows fire, and therefore, we feel convinced that the method we have instituted this year, that of prosecuting every person, man, woman or child who contravenes the Fire law is the right one. In this way only will we secure 100 per cent efficiency, in this way only can we hope to convince the careless ones that we are in earnest, that we, as a forest protection organization, intend to protect our present resources, intend to secure the second crop of timber, intend to achieve our ambition, that of making every citizen of the province a forest protectionist, and keep British Columbia free from fire.

## How British Columbia Penalizes the Fire Setter

The fire season, taken as a whole, has been a little below normal. The actual danger period opened late, showers being general until the end of June, when so far as concerns the three Southern Interior Districts, a hot dry spell set in, broken only by dry electrical storms. This condition obtained until the latter part of August, when a fairly general rain relieved matters considerably.

The number of fires reported to date (September 1) is 920 at a cost to the Department of \$51,000 or an average cost of \$55.50 per fire.

The system of appointing honorary fire wardens has worked splendidly, the staff are keen, pumps have been utilized on every occasion possible now that the full staff realize their worth, and every effort has been bent by each field officer to keep his record of fires below the quarter acre limit. The slogan adopted was no fire more than an acre or costing more than a dollar, and while we cannot live up to this as fully as we would like, yet the per-

centage of fires under a quarter of an acre is over 50 per cent, and of the total, possibly 75 per cent are under 0 acres.

While our reports to date are not quite complete the following summary is available:

Area burned over.....	50,000 acres
Board feet killed (merchantable).....	4,000 M.B.M.
*Other forms of property..	\$86,000.00

\*This includes a \$16,000 sawmill, \$3,000 automobile and a \$50,000.00 camp and logging equipment.

The wrong-doer has been having a thin time of it this season, the settler who thinks his fire is safe and so does not bother about a permit, or the most elementary precautions, finds himself before a magistrate in short order. Recently two Chinese were prosecuted for burning without a permit, and were promptly served with blue papers requesting them to appear at 2 p.m. the following day. At the designated hour, the Police Chief, the Forest Ranger and the Magistrate waited patiently till at 3 p.m. the Chinese ap-

peared. After the charge was read the Magistrate asked the interpreter to find out why the defendants did not appear at the appointed time. Before the question could be translated, one of the Orientals revealed his idea of the comparative value of his time and the magistrates', for he replied: "Me sellee vegetable." He was found guilty.

Altogether 38 prosecutions were entered, as follows:—

Failure to equip donkey engine with fire preventive appliance.....	1
Neglecting to extinguish fires.....	1
Burning without permits.....	27
Refusing to fight fire when called on	1
Leaving camp fires burning.....	8
	<b>38</b>

Of these, convictions were gained in all cases.

We hope that the peak of the season is now behind us, and that the fire damage and cost will be less than 50 per cent of the cost and damage of either of the seasons 1919 and 1920.



THE "MOVABLE LOOKOUT."

Courtesy American Forestry.

## Mechanical Improvements in Fire Fighting

By R. V. Stuart, B.C. Forest Service.

The efficiency of forest protection forces to-day depends on the nature and adequacy of the mechanical equipment with which they are furnished, and yet it is comparatively very few years ago that the equipment used in this important public service was almost without exception, of the most primitive type. Twelve years ago the look-out was practically unknown in the North-west. Fires were detected by means of ground patrols. This meant, in a great many instances, that fires assumed large proportions before being seen. Communications as we know them to-day did not exist in Forest Protection, and when a fire was discovered, the information was usually of little value, as on account of lack of rapid communication facilities and poor transportation, it was generally out of control before help could be obtained to extinguish it. Compare this with the actual situation (not the ideal) in many forest organ-

izations to-day. Fires are detected by means of look-out stations, in many cases supplemented by aeroplane patrols. The modern "look-out" equipped with scientific range finding instruments and up-to-date topographic maps enables the observer to locate fires with absolute precision, a distance of 25 miles or more on areas under direct observations. While with the aeroplane, fires are not only located accurately, but all necessary details regarding type of country on which fire is burning, property immediately endangered and natural fire breaks are also ascertained at the same time, thus facilitating greatly the fire fighter's task. When a fire is located, the request for help goes immediately over modern system of communications. Fire fighters and equipment, organized in advance, are quickly collected and rushed by modern methods of transportation to the scene of the fire. On arrival, if water is available, the fire

is fought and completely extinguished by portable gasoline pumps, or if there is no water, is controlled with tools that are adapted as a result of considerable study and observation to the type of forest on which the fire is burning. It is no exaggeration to say that modern mechanical facilities have revolutionized forest fire suppression in recent years and have shifted the odds for successfully combating fires considerably in the fire fighter's favor.

In discussing mechanical improvements in fire fighting, it is not to my intention to refer to the improvement in mechanical facilities for detecting fires. I would like, however, to give some particulars of the mechanical improvements effected in forest protection in connection with communication, transportation and the actual job of fire suppression, with special reference to progress in British Columbia.

[Editor's note: See Mr. Stuart's ar-

ticle elsewhere in this issue on wireless telephones.]

### The Motor Car for Fires.

In the adaptation of the automobile to forest protection work, efficiency in fire patrol and suppression have been advanced enormously in British Columbia. Previous to 1917 we were not using automobiles in forest protection beyond hiring an occasional car for transportation of fire fighters. Land patrols were either by horse or on foot. The automobile was looked upon as something of a luxury and as such was more or less banned. In 1917 we purchased a few Ford cars, there was a marked increase in efficiency of fire patrol that year and as a result, we have increased the number each year since, until we now have between fifty and sixty cars. We use Ford Roadsters entirely. Each car is equipped with a transfer box for carrying a portable fire fighting pump and other fire fighting tools and equipment. The advantage of the automobile over other forms of transportation is so obvious that it is unnecessary to enlarge upon it here. I would like, however, to give one instance of how the adoption of auto transportation has effected Fire Patrol in B.C. Taking the Fraser Valley and Island districts as an example. Forest areas in these districts are fairly accessible and well served by roads. Land clearing activity has been abnormally heavy since the close of the War. The burning permit law is in force, so that all burning between May 1st and October 1st has to be done under permit. Over three thousand permits have been applied for and issued in these two districts this year. Over 50 per cent of the areas to be burned were inspected by Forest officers before permits were issued, and in the majority of cases, a second and third inspection was made to see whether the slash had been burned and to make sure that fires were properly extinguished. The result of this close supervision has been that out of these three thousand clearing fires set out under permit, only seven escaped control. The supervision would have been impossible with the staff employed without modern transportation facilities. A few years ago the Fraser Valley was exempt from the burning permit law and one of the chief arguments against the rescinding of this exemption was that it would be impossible for forest officers to issue and supervise land clearing fires, as the job would call for an army of men.

### Where Good Equipment Helps.

Thanks to the co-operation of the municipal authorities in the issuance of permits, and the fact that our men are equipped with good transportation facilities, we have succeeded in giving all the supervision necessary. Complaints from settlers are very rare, and in a district

where we have had as many as fifty uncontrolled fires at one time in previous years, this year we did not have half a dozen. We have only four men in the Fraser Valley, three of whom are supplied with cars.

Before passing from the subject of transportation, I would like to describe the system we have in use in the territory West of the Cascade Range traversed by the Pacific Great Eastern Railway. This country has a very high fire hazard owing to the amount of logging and land clearing going on and owing to it being a very popular resort for tourists and campers of all descriptions. Its history, which as far as fire was concerned, was one of the worst in the Province, culminated in 1919 with a series of disastrous fires which destroyed a large railroad bridge and tied up the railroad for several weeks. Up to 1919 we had maintained patrols through this country, but they had no transportation facilities, except what they could secure from the Railway Company, and as there are no other means of travel through the country, they were extremely handicapped. In 1920 we obtained permission from the Department of Railways to operate a speeder patrol over a portion of the line, a distance of approximately 80 miles. Additional tool caches were established and a portable fire pump supplied with the result in 1920, although we had the largest number of fires on record that year, they were with very few exceptions discovered by the patrol crew whilst in incipient stages and extinguished at small cost. This year we doubled the number of speeders and added to each a trailer to carry the portable fire fighting pump, 1,000 feet of hose and sufficient fire fighting tools for twelve men crew. The increased expenditure has been more than justified. Owing to more efficient patrol, the number of fires has considerably decreased; all except one, have been extinguished without cost except labor of patrol crew and use of equipment, and the fire loss in this territory which used to run into many thousands annually, has not amounted to very little over one hundred dollars this year. The results here are to a great extent attributable to better transportation facilities.

The development of the portable gasoline fire pump has undoubtedly been the most outstanding improvement in actual fire suppression equipment up to the present. In British Columbia we have given a great deal of time and expense to the development of a satisfactory portable pump. Most of our fires, on the coast at any rate, usually occur within reach of a plentiful water supply, and we felt that if an efficient pump could be obtained, we would be able in a normal season to not only bring our annual fire fighting bill down to the proper size, but to also reduce

the annual fire loss down to a negligible figure.

We are using two types of pumps, both rotary. One driven by a two cylinder, two cycle high speed engine, the unit weighing approximately 130 lbs., and delivering about 25 gallons of water per minute against a head of 175 feet. The other operated by a single cylinder 4 H.P. heavy duty engine, and the unit weighs about 170 lbs. and delivers about 45 gallons per minute against a head of approximately 200 feet.

Either pump will do just as much work on a fire as a crew of twenty men equipped with ordinary fire fighting tools, but with this difference, the crew using the ordinary fire fighting tools as a rule are fortunate if they can control the fire, while with the pump it is completely extinguished, put dead out, beyond the danger of a come back. Anyone who has tackled the job of fighting a fire in a logging slash and has seen it brought under control after much difficulty, held for days, and then get away with the first wind that came up, will appreciate what this means.

### Improving the Pumps.

We commenced using portable pumps in 1918, when we purchased one of the light high speed type. It was tried out in various districts that year with fair success, and as a result we purchased a number the following year. We needed a pump with more power, however, and in the Winter of 1919 in conjunction with a local concern, we carried out a number of experiments and as a result purchased a number of the single cylinder heavy duty type. We put these in the field last year and although they were a long way from being all that we expected, they were fairly satisfactory, and we put out a lot of fires with them. Last winter we improved them very considerably and I can safely say that this year they have to a great extent replaced the ordinary fire fighting tools on the majority of our fires. We have had a pump work on a fire nine days continuously, stopping only for change of fuel and oiling, and time and again they have saved logging equipment, logs and buildings from being wiped out.

After a fire which occurred on the lower coast in August, and which graphically illustrated the value of the pumps, originated on the edge of a slash over a thousand acres in extent. There was a wagon road up to the area and the ranger was on the scene in less than an hour after the fire started. The fire had then covered over an acre. One pump was in action in short order and soon afterwards the assistant ranger arrived on the scene with a second. With a total crew of six men, the fire was soon completely extinguished. The following day there was a high wind but no recurrence of the fire, as it had been completely extinguished.

# CANADA'S LUMBER CUT BY PROVINCES AND PERCENTAGE OF CUT

*Especially prepared by R. D. Prettie, Supt. of Forestry, C.P.R., Calgary.*

Province.	Million of Feet.	Percentage of total Production.	Million of Feet.	Percentage of total Production.	Million of Feet.	Percentage of total Production.	Million of Feet.	Percentage of total Production.	Million of Feet.	Percentage of total Production.	Million of Feet.	Percentage of total Production.	Million of Feet.	Percentage of total Production.		
British Columbia	647	19.3	790	20.7	1,313	29.9	1,173	30.7	669	17.4	875	25.1	1,157	29.8		
New Brunswick	308	9.2	391	10.3	---	---	---	---	---	---	442	11.00	---	573		
Ontario	1,294	38.7	1,519	39.8	1,385	31.6	1,101	28.8	1,035	26.9	894	25.6	1,110	29.1		
Quebec	690	20.6	638	16.7	677	15.4	630	16.5	1,078	28.1	818	23.5	841	21.2		
Total Canada	3,348	---	3,814	---	4,389	---	3,816	---	3,842	---	3,490	---	3,886	---	4,126	---

## 100,000 Canadian Citizens Visit our Exhibit Car This Year

By G. Gerald Blyth.

Readers of the Forestry Magazine have followed the progress of the Forestry Exhibit Car of the Canadian Forestry Association, and many of the Eastern members have visited the car in person and have witnessed for themselves the enthusiasm manifested by the large crowds at the various towns at which the car stopped.

The new car, 15 feet longer than the one used last year, was loaned by the Canadian National Railways and fitted up in April at Ottawa for the 1921 tour. A portable moving picture machine with a splendid collection of films on lumbering, outdoor life and forest fire protection formed a very important part of the equipment and a moving picture demonstration together with a short talk on fire protection and the importance of our timber as a national asset was given each evening.

During the period in which the car has been "on the road," namely from May 4th to date of writing, September 14th, 105 lectures were delivered and considerably over 100,000 persons passed through the car.

In the larger centres, through the courtesy and co-operation of theatre owners, large audiences of school children, often aggregating 1,200 to 1,800, were treated to a moving picture demonstration on forest protection, after having visited the car.

Among some of the notable persons who paid the car a visit during the season were His Excellency the Governor General, His Honor, the Lieut.-Governor of the Province of Quebec, the Rt. Hon. Arthur Meighen, the Acting Premier of New Brunswick, the Ministers of Agriculture and Education for Ontario, and many members of the House of Commons and the Provincial Legislatures.

The association is endeavouring particularly to interest the youth of this country in the preservation of our forests. Through the medium of the Exhibit Car

### THEN GENTLY SCAN.

By Douglas Malloch, the Lumberman Poet.

We none of us are perfect—none  
Has seen a day entirely sun;  
Across each pathway shadows fall,  
There is some good and bad in all—  
"Then gently scan your fellowman".  
And judge him kindly as you can.

We none of us are always wise—  
Some cloud will cross the bluest skies,  
Some error oftentimes will find  
A lodgement in the wisest mind—  
It is the errors of our youth  
That give to the store of truth.

We are not always pleasant—we  
Have storms as well as hill or sea,  
When anger's blackest thunders roll  
Across the apex of the soul—  
In such an hour in other men  
Let us wait the sun again.

We none of us are perfect—in  
The judging of another's sin,  
Another's error, saint or fool,  
There is but one impartial rule—  
Let us demand no more, yea less,  
Of good than we ourselves possess.

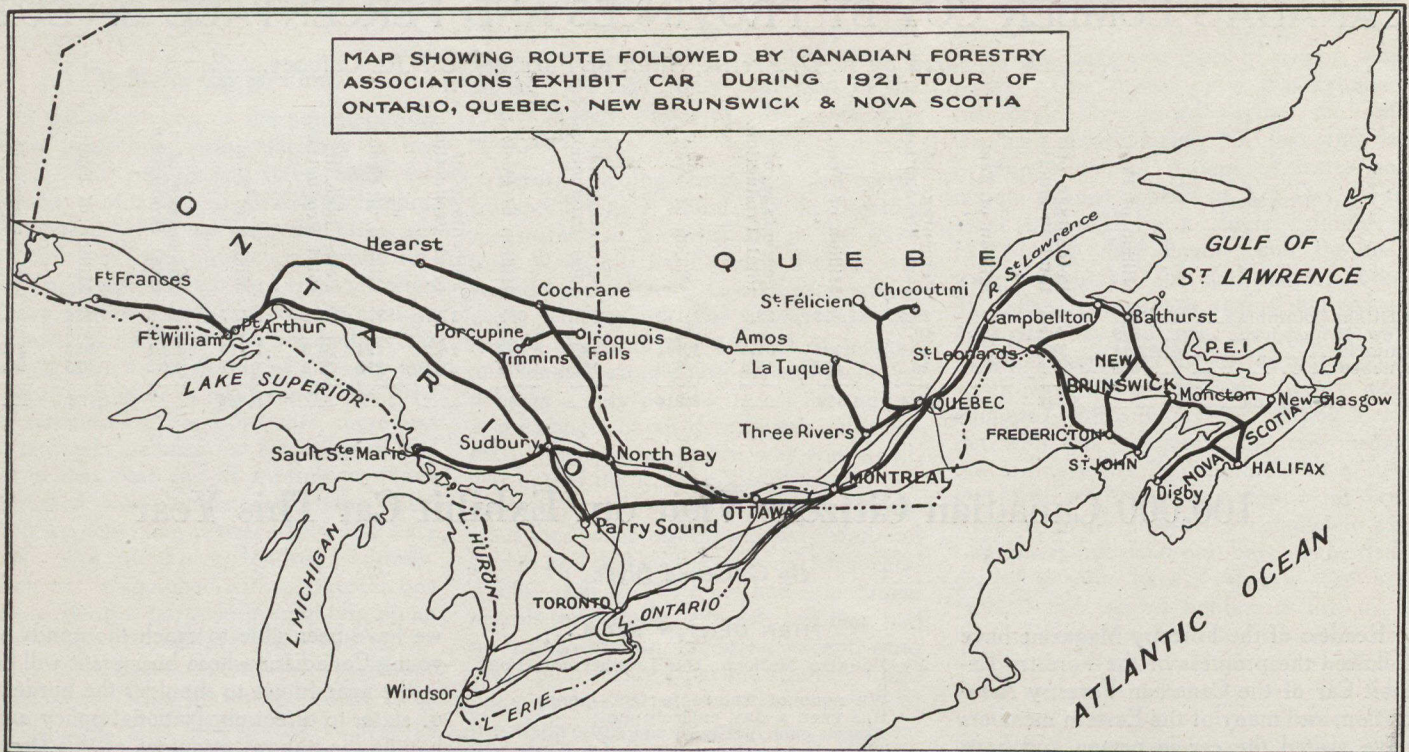
We none of us are perfect. Then  
The greatest brotherhood of men  
Is in forgiveness, charity—  
Ourselves is other men to see,  
And in ourselves to recognize  
The fool as quickly as the wise.

we have been able to reach thousands of young Canadians whose business it will be in the near future to shoulder the burdens of state, to direct our National policy and handle the natural resources of this Dominion. The Canadian Forestry Association believes that to educate the rising generation to the value and importance of our forest wealth is to take a great step forward in its future protection both from fire and waste.

The car has not only travelled the main lines has been run up branch lines to many remote places; it has even travelled over logging railroads and lectures have been given to the men of the bush, at the saw-mill and in the camp, even in their own bunk-houses. The car is so well equipped electrically that storage batteries and the picture machine can be removed, and a successful picture show can be given away from and entirely independent of the Exhibit Car when the occasion demands.



The Canadian Forestry Association's Exhibit Car taken to a lumber camp near Pakesley, Ontario. Such an unexpected visitor (over a logging railway) was given a royal reception.



The above map outlines in heavy black the railway lines in Ontario, Quebec, New Brunswick and Nova Scotia, along which the Canadian Forestry Association's Fortes Exhibits Car "a forest protection school on wheels," has travelled in the 1921 season. It is hoped to send the Exhibits Car with the Association's Lecture Car attached into the territory south of the St. Lawrence before November.

The Forest Exhibits Car has visited at the time of going to press (October 1st) 92 communities and has been responsible for 101 evening lectures on forest protection. It has covered 7,052 miles, the Canadian Pacific and Canadian National railways granting free haulage everywhere.

More than 100,000 people have visited the exhibits between May 6th and October 1st. From the novel and instructive nature of the objects, and the forcefulness of the arguments for forest fire prevention, it is not too much to say that every person, big and little, carried home some intelligent idea of the value of Canada's forests. From many parts of Eastern Canada have come valued testimonials as to the real educational effect of the Forest Exhibits Car. The tour this season was in charge of Mr. Gerald Blyth, Assistant Secretary of the Association and English- and French-speaking helpers.

## A Message From the President of the Canadian Pacific Railway

The following letter was received on October 7th by the Secretary of the Canadian Forestry Association from Mr. E. W. Beatty, President of the Canadian Pacific Railway Co.:—

"It is a matter of great gratification to all of us that the work of your Association is being carried on with such conspicuous success and I heartily congratulate you and your associates."



A view of British Columbia Coastal timber, Cedar, Hemlock and Douglas Fir.



## "Pacific Coast Lumberman" on British Columbia Forestry Convention

"As Mr. Ussher, president of the Canadian Forestry Association, and Mr. Robson Black, the Secretary, sped eastward at the conclusion of the recent convention, carrying with them the hearty thanks of all who had attended the gathering they had originated, one can imagine them exclaiming in unison, "Well, we have started something in British Columbia any way, and that is the first of a series of important forestry conventions of their own."

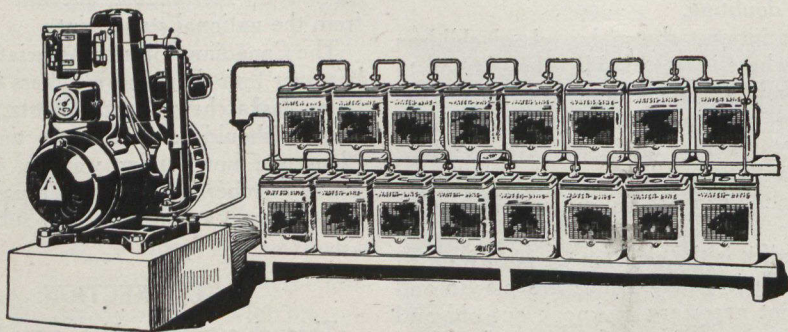
"For the most noticeable thing in the proceedings of the convention was its direct concern with problems mainly affecting this province. Held as it was in the two centres of the B.C. lumbering industry, its attendance was chiefly British Columbian and, with two exceptions, the programme was made up of items dealing for the greater part, with B.C. conditions contributed by experts whose interests, scientific or commercial, are quite dependent upon the conservation of the lumber

resources of this province. Many individual papers were given, the value of which alone may be almost said to have justified the gathering. The contributions made to our knowledge of up-to-date fire protection methods, of the progress of scientific research and incidentally the crying need for further facilities in this connection, were of surpassing interest. Not less important than the subject of the conservation of our timber were the addresses dealing with the marketing of the manufactured lumber. On one subject all the speakers agreed. Invariably in the course of their remarks did they refer to the excellent work that the Canadian Forestry Association is carrying on both in the matter of providing valuable data to the members of the industry itself, and in the education of the general public to the realization of the extreme importance of their mighty heritage, the forests of the Dominion."

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The plant illustrated above is identical with that used on the 1921 Tour of the Canadian Forestry Association's Eastern Exhibit Car.

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### THE B.C. FORESTRY CONVENTION.

(Excerpt from Pacific Coast Lumberman.)

"The result was a highly successful and most instructive gathering, and on all sides hopes were expressed that this will be the first of many such conventions to be arranged by the Forestry Association, the value of whose services to the lumber industry of the Dominion in creating a sound public opinion upon forestry problems cannot be overestimated."

### "EXPRESSES MY VIEWS PERFECTLY"

From Mrs. W. T. Hayhurst, R.R. No. 2,  
Armstrong, B.C.:

Enclosed please find \$2.00 for a renewal subscription and membership in the Canadian Forestry Association for the coming year.

Also names of people whom I know to be lovers of trees and nature generally.

The Forestry Magazine itself expresses my views most perfectly.

Yours sincerely in the Forestry cause.

### AEROPLANE FOR SALE.

"FOR SALE—Curtis JN-4, registered, perfect flying condition, fitted with sea floats and land undercarriage. Flown 30 minutes since overhauled. Delivery ex Chicoutimi Air Harbor. Price \$1,200.00, or best offer. Apply Aviation Dept., Price Bros. Co., Ltd., Chicoutimi, P.Q."



## Serving Two Nations in One Day.

One of the odd experiences of the Canadian Forestry Association's Tree Planting Car in the prairie province this year was encountered at Coutts, Alberta. This town lies directly alongside the United States boundary, the American municipality adjoining being called Yellowgrass. When the Tree Planting Car arrived for its daily lectures, the only siding available lay half in the United States and the remainder in Canada. Curiously enough, the school authorities of Yellowgrass, confident of the hospitality of the Canadian Forestry Association, brought their school children to a special

lecture and a little later the Canadian children from Coutts also assembled. At the conclusion of the lectures, the odd spectacle presented itself of Mr. Mitchell, the Association's lecturer, carrying on discussion with American citizens at one end of the car, resting on American soil, while Mr. Cooch, his assistant was engaged at the other end of the car with Canadian citizens on Canadian soil. Surely the Tree Planting Car that day was acting as the international "bridge of understanding" to which the orators so frequently refer.

## NEW BRUNSWICK'S EXPERIENCE WITH FIRES.

Fredericton, N.B., August 27, 1921.—Weather statistics recorded by the Federal stations in New Brunswick show the present fire season to have been the driest for over half a century. Periods of from six to twenty-five days occurred without any rainfall, not even showers with the precipitation from 30 per cent to 70 per cent below the average for the various stations during the months of May, June and July. This condition coupled with drying winds and extremely hot weather not only dried out the field crops but made conditions in the forest the most hazardous for fires on record, and rendered fire fighting very difficult on account of the lack of water in the swamps and brooks and the very dry condition of the soil.

Statistics for the fire season have not been completely compiled at the time of writing, and may reveal some changes upon closer investigation. About 300 fires have been reported, of which 200 required extra crews of men to extinguish. About 60,000 acres were burned over, 80 per cent of which was previously burned over land. Forty per cent of the area burned was privately owned land. The cost of extinguishing is in excess of previous years. The most serious day of the year was on August 6th when a very heavy windstorm swept across the southern part of the province, rendering the control of fires very difficult. Several residences at the summer resort of Westfield were burned as well as five houses at the village of Gagetown.

### Causes of Fires.

Fishermen, campers, picnic parties and others in the woods were the cause of about fifty per cent of the fires. Railways caused twenty per cent, settlers fourteen per cent, while thirteen per cent are charged to miscellaneous causes. Lightning has for the first time in the experience of the Department caused serious fires, three per cent being attributed to this cause due no doubt to the extremely dry weather and thunder storms, not followed by heavy rains. The very dry condition of the woods accounts to some extent for the large number of fires charged to camps as it was found that in several cases fires spread from campers fires where the party had used precaution and put water on their fires.

### Standing timber Escapes.

Apart from the loss of property at Westfield and Gagetown the damage to standing timber has been very small this year. Complete statistics are yet not available regarding the amount of timber burned. The damage caused from the different sources of fires is not in the same proportion as the causes. Settlers' fires caused practically no damage this year, while the damage from railways is also small. The restriction placed on all slash burning on

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Absolute dependability makes the Monarch Tractor particularly suited to work in the lumber woods where expert mechanics and spare parts are usually many miles distant.

For instance, the manganese steel chain belt treads on which the Monarch "creeps" show so little wear that they are guaranteed unconditionally for the life of the tractor.

These chain treads—like those used on the huge war tanks—enable the Monarch to travel on any surface. It lays its own track as it goes.

Write for Catalogue

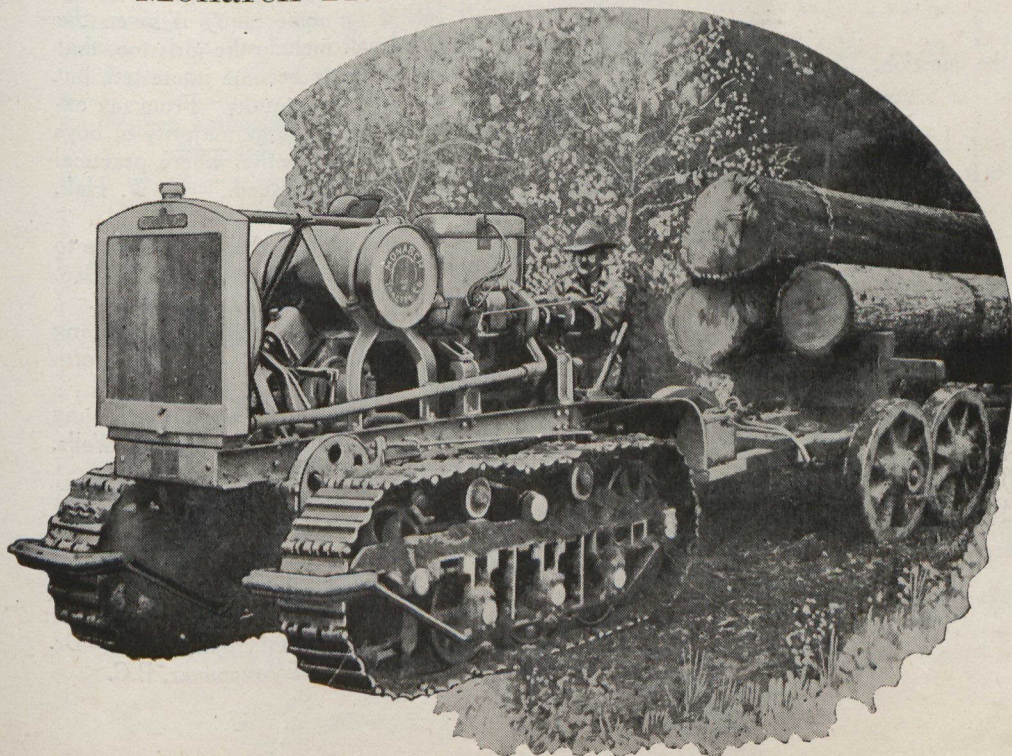
Monarch Tractors Limited, Brantford, Ont.

It pulls heavy loads over deep snow and ice, through bogs or sandy ground, for it gets sure footing on any surface.

Ability to turn in its own length enables it to take the sharp curves in forest roads with ease.

It is easy to operate, and economical, too, for its fuel is coal oil.

In addition, the Monarch supplies winch power for snaking, and belt power for any purpose for which an engine may be required.



May 20th, which prohibited the using of fire permits, accounts for the reduction in the number of fires and damage caused from settlers' fires.

Fall burning of slash is being agitated throughout the province. Of the total number of fires, over half were extinguished before spreading over five acres. Over 1,000 temporary fire wardens were on the lookout for fire during the dry periods. The lookouts rendered valuable service in forest fire detection and the hearty co-operation of all the lumbermen

in supplying equipment at the fires was of considerable aid in quickly organizing fire fighting crews. The co-operative wardens of the licensees and private land owners have rendered valuable service.

Forest fires may only be reduced by eliminating the causes. As stated above, the restriction on slash burning has practically reduced the danger from slash fires and the precautions taken by the railways in keeping their locomotives in condition and patrolling the right of way has materially reduced the railway fires. Fisher-

men and campers' fires must be controlled, and in view of the comparatively large damage and large number of fires attributed to this cause, the Department now has under consideration prohibiting fishermen and others from entering the forest in the dry season without a permit from the forest ranger.

#### THE TREE PLANTING PLAN FOR CHILDREN.

The Canadian Forestry Association's plan to interest the boys and girls of Canada in tree planting through a national essay competition (as announced) has aroused the enthusiasm of our members and has given the undertaking an auspicious baptism. Arrangements are proceeding by which the educational departments of the various governments will give their co-operation and the help of all newspapers will be available in getting the children aroused. Some of the comments sent in by Association members are given herewith:

"An excellent plan. Should have far reaching and beneficial results."—B. F. Avery, Sault Ste. Marie, Ont.

"Get the local representative, or the teachers to tell the children what the trees mean and do."—B. F. Griggs, Winnipeg, Man.

"Come over into—Nova Scotia—and help us."—David L. Whitby, Truro, N.S.

"Interest is already being awakened. Keep up the effort by all means. Your plan is good."—George Ashdown, Winnipeg, Man.

"A splendid idea. The essay should apply by all means to the writer's home territory."—Jos. A. Wright, Winnipeg, Man.

"An excellent idea."—Dr. E. R. Proctor, Whitby, Ont.

"We should do all we could about the two lines."—Jos. Miljour, Fugerville, P.Q.

"I feel if an opportunity is given the boys and I will include the girls too, that they will not only become interested, but will show practical results. From my experience, I find the large majority of boys will act upon instruction where practical results can be attained."—F. W. Hall, Perth, Ont.

"It is the children of today we have to depend on for our forest reserve."—Geo. E. Hymers, Hymers, Ont.

"For many years I have been a strong advocate of this work."—Geo. Durnford, Montreal, P.Q.

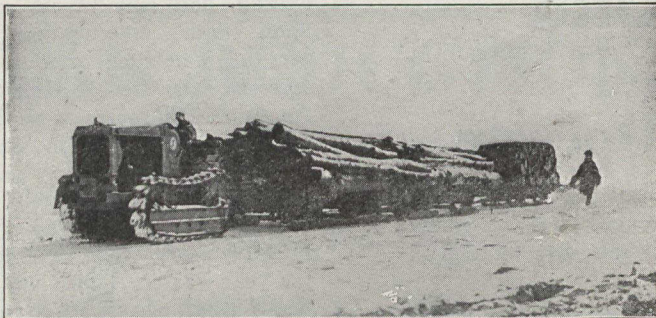
"Very important to have the 'young idea' in this matter."—George C. Wells, Montreal, P.Q.

"I think your plan a good one."—E. Pugsley, Kitchener, Ont.

"An amateur photo competition might also stimulate interest."—G. A. Gamsby, Summerberry, Sask.

"Laying a rational foundation."—Dr. Robert MacKenzie, Vancouver, B.C.

## The Tractor for Logging Lumbering and Hauling



**JT** TRACTOR HAULING LOAD OF 24 TONS AT 20° BELOW ZERO.

The **JT** is dimensioned for its ability to go ahead where there is no road—under trees and between them—its traction is sure in the underbrush, on solid, swampy or sandy ground—its control is sensitive and positive—it can be handled to the fraction of an inch in narrow passages.

It will snake logs when teams are out of the question.

The **JT** will turn in a radius of 6 ft., its width over all is 60 inches, and it has a caterpillar traction of 1,628 sq. inches.

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**DEATH OF HON. W. C. EDWARDS.**

Through the passing of the Hon. Senator William C. Edwards, of Ottawa, in his seventy-eighth year, a veteran figure in the lumber industry, the Canadian Forestry Association has lost one of its outstanding Directors and Past Presidents. The late Senator took a very active interest in the affairs of the Association and in 1910 was made Vice-President. Through the absence of the President at the Convention held in Fredericton in 1910, Senator Edwards was called upon to preside. Next year he very ably presided over the bi-lingual convention held in the Quebec Legislative Assembly which was opened by the late Earl Grey, Governor General of Canada.

The late Senator took a very deep interest in public matters that affected the welfare and prosperity of Canada and was chairman of the Committee on Forests of the Conservation Commission. For several years he sat in the House of Commons as a member for Russell County, and in 1903 was summoned to the Senate.

Frequently during a period of failing health and with his time plentifully occupied by business affairs, Senator Edwards set aside personal considerations to serve the Canadian Forestry Association's interests. In more than one emergency his influence tipped the scale in the Association's favor.

Senator Edwards is survived by his wife and several brothers and sisters. Gordon C. Edwards, a Director of the Canadian Forestry Association, who for many years has been prominently associated with W. C. Edwards & Co., is a nephew.



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## Forest Fires and Canada's Fur Trade

By Wm. MacMillan (of Holt, Renfrew & Co.)

Seldom does the casual observer or even the interested individual for that matter, ever see those two highly important subjects discussed together.

Much has been said and more has been written of the vast areas of timber lands, falling prey to the flames. Far easier to

reduce that resultant loss of lumber, into dollars and cents, than to estimate with the faintest degree of accuracy the pecuniary loss in so far as the fur bearers are concerned.

That forest fires destroy wild life is unquestioned—but to what extent is a

somewhat debatable question. Endowed with keen brains and active bodies, most of the wild folk, it would appear, scurry before the onrush of the flames—on occasion leaving their young to fight as best they may.

To the experienced man of the woods, the action of certain wild creatures follows certain clearly defined lines, for instance, during a fire of any consequence, such peculiarly gifted animals as the Beaver and the Rat, plunge to the bottom of the nearest stream or lake, and being root-eaters, have no difficulty in finding sufficient nourishment. The Mink or Otter too, seek protection in the cool waters of a nearby stream and there find usually enough Muskrat and fish to guarantee them against hunger.

But these other non-water animals, the Moose, Caribou, Bear, Lynx, Fisher, Marten, Bear, etc., flee before the crackling flames to distant hunting grounds and seldom return to their former haunts till the second or third summer has attempted to clothe the burnt out section with an under carpet of green. Thus the game is pushed to the farther extremes of civilization and the trapper must needs hunt on more extended lines with its attendant increase in cost and hardship.

The fur business today stands with our forests, among the most powerful of the real assets of our future.

Just as the cry of the world is for our particular timber so the type of furs that men and women of the old and new worlds desire, has to be had in our wonderful Canadian forests, and only by the immediate enactment of wise legislation will our forests and fur bearers be conserved for the profit of the coming generations of Canadians.

### MODERN FOREST FIRE FIGHTING.

Great as has been the advance in fire fighting methods and equipment in towns and cities in Canada in the last five years, the advance in fighting forest fires has been even greater. Dominion, provincial, and private forest organizations are now using airplanes, power launches, railway speeders, automobile trucks, and portable gasoline pumps, besides the old reliable horses, spades, hoes, and wet sacks, in their protective work, and are calling men out to danger points by means of telephones, heliographs, and others signalling apparatus.

## The Arctic Eiderdown Robe Is a White Man's Bed

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The rabbit skin blanket developed a colony of "cooties," the sealskin bag became a wet and evil smelling abomination, and the wool blankets were the ordinary weighty nuisance. Then I became the owner of an Arctic Eiderdown Robe and found it a revelation of lightness, warmth and comfort; because I could crawl into it at night discarding tent or fire, and sleep as warmly and soundly as in my bed at home. I am writing this in a real spirit of gratitude and appreciation, hoping that others belonging to the shivery clan, that claims me in full tribe membership, will profit thereby. It is a white man's bed, regardless of how many minus degrees the thermometer marks. How you get so many "Calories" into it I don't know, but the important part is you do, and that is enough.

Yours very truly C. A. HAZEN.

THE value of an Arctic Eiderdown Robe can only be appreciated by actual use. Mr. C. A. Hazen has voluntarily written us regarding his experiences and upon solicitation consented to allow us to publish the accompanying extract from his letter.

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## Idle Acres Can be Set to Work.

"An idle acre is as much an economic waste as an idle working man and the nation needs work today."

With this appeal the American Paper and Pulp Association is sending to its membership a review of the work of its Forestry Committee in advance of the coming Fall Business Conference at Chicago, October 31 to November 4. After telling of the actual extensive reforestation work being done by paper manufacturers, particularly in the East, the Association reviews the whole subject of forestry by saying:

"The paper industry is an active participant in the campaign to restock 81,000,000 acres of idle forest land. The wood from so large an area is more than will be needed by the paper industry, even though the acres now idle become productive. The nation needs work today not only by the human element in industry, but the other elements entering into industry and business. It is inconceivable that this progressive and aggressive country of ours can allow 81,000,000 acres of land to loaf while the product procurable from this land is needed. The Shell-McCormick bill now in Congress will be given a full and free hearing by Congressional Committees, probably in January.

"The last six months has seen national recognition given to the paper industry for its leadership in the campaign for forestry legislation. While the paper industry uses less than 4 per cent of the total lumber cut of the country, there is good reason to anticipate that before another year national legislation will have been enacted, founded on the principle of federal co-operation with the States and private owners, without federal control of private operations."

The foresters of the paper industry will discuss practical forestry at the meeting of the Woodlands Section during the fall Conference week at Chicago, their session being set for Wednesday, November 2. Twenty sectional meetings will be held during the week, with the main meeting of the American Paper and Pulp Association, Thursday, November 3.

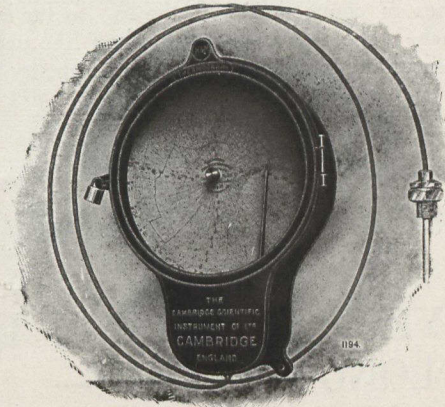
### A FORESTRY BOOKLET FOR THE ASKING.

Through the kindness of the Canadian Pulp and Paper Association we are able to offer our readers free copies of a highly important and most interesting brochure entitled, "Forestry Conditions in Sweden, Finland, Norway, Great Britain and France," written by Mr. Edward Beck, who as representative of the above Association spent the summer of 1921 in those countries investigating forest conditions.

The contents of the publication deal not so much with the theories of silviculture but with the part played by the State and by the private owners of timberlands in the maintenance and renewal of the forest resources. No series of papers

could have a more practical and stimulating influence upon forest management in Canada.

By all means write for a copy to the Canadian Pulp and Paper Association, Drummond Building, Montreal. It will repay perusal many times over and will be retained as a permanent reference.



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**TESTING CANADIAN WOODS.**

The announcement has recently been made that the Board of Works for the United Kingdom has added certain Canadian timbers to the list of those used by the department. That the qualities of Canadian woods might be understood and the timbers thereby put to the best possible use was the object of the Minister of the Interior, Canada, in establishing the Forest Products Laboratories in connection with the Forestry Branch. The laboratories are making mechanical and physical

tests of Canadian woods and the results are published from time to time as the investigation of each species or group is completed. The information obtained is proving of great value not only to timber users in Great Britain and other countries, but also to Canadian engineers, architects and builders. Beginning with the more important species the investigation is to proceed until all woods having any commercial value are tested. Bulletins 59 and 60, the two so far issued on this subject, may be had free upon application to the Director of Forestry, Ottawa.

**A CANADIAN OBSERVER IN FINLAND.**

By Edward Beck.

HELSINGFORS, Finland. — Finland, perhaps more than Sweden, is dependent upon her forest resources. As in Sweden, the people appreciate the importance of maintaining and increasing these resources, although this realization, as interpreted into practical usage and protective legislation, dates back less than a quarter of a century. Before that time Finnish forests were largely allowed to take care of themselves.

During the last twenty-five years laws, based upon those of Sweden, have been enacted and are now rigidly enforced. State and private owners of forests cooperate together in building up and maintaining the forests and in employing means for their perpetuation.

The practice of reforestation on a broad scale is carried on almost universally, except in the more northerly parts of the country where there is still much wild land. Finnish forest methods, however, are generally based upon the theory that it is better to let nature do the work where possible and to use artificial means only where necessary, and most of the cutting is done with that end in view. Some fine examples of natural forests from 60 to 80 years old are to be seen.

Here, as in Sweden, the private owners put their forestry and logging operations under a single supervision and management. The chief forester directs how and what trees shall be cut, always with the object of impairing the growing forests as little as possible, and following the cutting operations when necessary with replanting. Most of the companies buy timber in addition to cutting their own. They maintain separate organizations to deal with bought timber but the same requirements as to replanting is made to apply.

The extent of the forest organizations built up and maintained by the companies may be illustrated by that of the Kymmene Aktiebolag, one of Finland's largest pulp and paper companies, which owns over 600,000 acres of forest lands scattered over a wide area. This company employs a chief forester, nine district chiefs, 100 foremen and the necessary laborers, all of whom devote their entire time to forest operations. The chief forester and the district chiefs are well paid and are each provided with a home which is also the forest headquarters for the district. All the chiefs are trained foresters, and have been through the technical schools established for that purpose. This company has also accomplished what few state or private owners have succeeded in having made a complete survey of their forests and learning to a certainty the amount of available timber, the annual growth and all other details. By means of this survey they have been enabled to

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map out their forest program for years in advance.

Finland's total area comprises approximately 144,250 sq. miles, of which about 17,000 square miles, or 11.75 per cent of inland waters. More than one-half of the land area is made up of forests. There are about 75,000 square miles which produce merchantable timber, of which about 58,000 square miles are classed as highly productive. About one-third of Finland's land area lies north of the Arctic circle and includes most of the less productive forests.

**Owners Must Replant.**

In Finland the State owns about 38 per cent of all the land, including 20,000 square miles of productive forests. (There are private companies in Canada which control a considerably larger forest area). Private companies own a greater proportion of the best forests, their holdings approximately 55,000 square miles. The State sells the standing timber on its holdings by methods similar to Sweden's and makes adequate provision for its replacement. Private owners are restricted as to the uses of their forests and are not allowed to cut in any manner that is considered injurious to future development. When they cut the land clean, as they sometimes do, they are obliged to replant it.

Selective cutting is generally practiced, the trees being taken out with due regard to the effect produced on those left standing. Drainage is resorted to for the purpose of increasing production, and thinning is carried out in a scientific manner at necessary intervals. Fire hazards have been reduced to a minimum and the fire losses, compared with those in Canada, are practically negligible.

Pine and spruce form the basis of most of the forests, with an admixture of birch and other hardwood species. No authentic survey of the timber resources of Finland is available, although there are several estimates which are held to be reliable. One, made by Col. Gosta Serlachius, president of the Finska Cellulosa-forcumigen, places the timber resources of the country at approximately 31,000,000,000 cubic feet (335,000,000 cords). Calculations made on the assumption of an annual growth of 1.5 per cent, which has been shown to be below the actual, indicates a yearly yield for the entire country of 5,650,000 cords.

Finland's present timber requirements for all purposes, domestic and industrial, are drawn chiefly from a territory which includes rather less than three-fourths of the total forest area of the country. This territory, however, represents a considerably larger part of the actual timber resources. It is estimated that from 20 to 25 per cent of the total standing timber of the country may be classed as merchantable material of sawlog dimensions. In normal years Finland exports about



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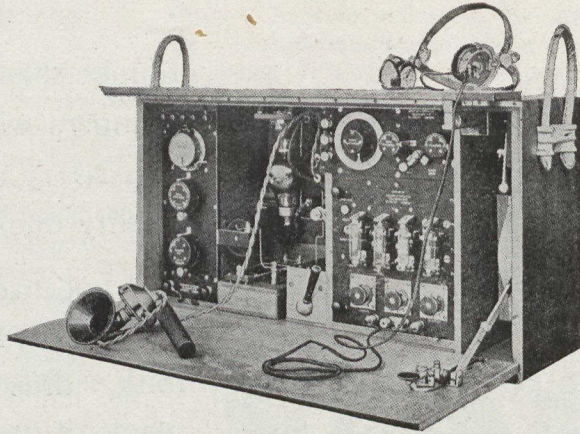
300,000,000 cubic feet of timber and sawn lumber. (There are approximately 375 sawmills in Finland, many of which, however, are of very limited capacity). The wood pulp industry produces 220,000 tons of mechanical and 350,000 tons of chemical pulp a year, using up about 900,000 cords of wood in the process. The consumption of timber for domestic requirements, including industrial and railway fuel. (All locomotives here burn wood) has been estimated at 5,000,000 cords a year, much of which is hardwood, principally birch.

These figures indicate on the surface that Finland is using every year an amount of wood equal to or exceeding the estimated annual growth, although in reality, especially when active reforesta-

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tion is taken into account, the annual increment is considerably greater. It has been estimated that the forest resources of Finland are sufficient to insure a supply of pulpwood for requirements based upon the present rate of consumption for 145 years, without taking into account the new forests that are growing up in the meantime.

**Progressive State Policy.**

During recent years the Finnish government has increased its forest holdings by purchases from private owners, a policy adopted with a view to restoring the productivity of lands exhausted by reckless cutting in the past and of raising the general standard of economic forestry in the country. The most desirable areas of accessible timber lands in Finland are now well taken up and there is apparently little prospect for industrial companies to increase their holdings by purchasing additional lands from the State. During the unsettled conditions of the past few years there have been many transfers of land among private and corporate owners, with the result that several of the stronger industrial companies have greatly improved their position in this respect. Today, however, the State is doing its utmost to prevent agricultural lands from being bought up by the companies and reverting to forests.

Forest practice and lumbering methods in general while showing marked improvement in the last fifteen years are still said to fall somewhat short of the high stage of development reached in Sweden. State supervision and control, as already noted, have been responsible for great improve-

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ment in forestry practice and the increasing value of timber has gradually forced a higher standard of efficiency in lumbering methods and the utilization of timber for industrial purposes. In some remote districts there is said to be still much waste of timber by reason of careless lumbering and from fires and other sources, but these are in a fair way of being eliminated.

Timber and water powers constitute Finland's chief national asset, and the lumber, pulp and paper industries are and must continue to be the foundation of the entire economic life of the country. The present population of Finland does not exceed 3,500,000. Although 55 per cent of the people are classes as dependent on agriculture, the country as a whole is not self-sustaining as to food. Many peasant farmers engage in lumbering during the winter season and the sale of timber from small peasant holdings constitutes an important part of the annual cut of timber. The growth of present importance of the timber industry is of prime importance to the national welfare. The fact that the Government and the people as a whole fully realize this is shown by the manner in which the forests are now being maintained as well as by the steps that are being taken to ensure their future.

offers, has fluctuated with the rise and fall of business in the lumber and pulp-wood circles. For a period of years back he has felt acutely the rising activity or waning strength of the lumber market, and as a rule the demands or lack of demands for his services have preceded slightly the general apparent trend, just as stock market prices are apt to discount futures. With these past facts in mind he feels reasonably optimistic as to the comparatively near future, as quite a

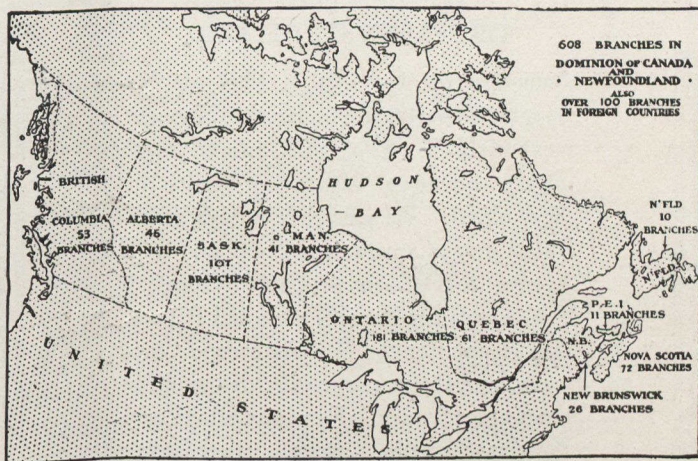
quicken call for estimates and working plans is making itself felt, in distinct comparison with the period commencing early last autumn and lasting thru most of the winter, when new orders were scarce and the Sewall crews were kept busy mainly on work already started.

Mr. Sewall has about 50 men in the field with work going on as far south as Florida and as far north as Quebec, as well as in various parts of New England, New York and Pennsylvania.

**A Business Barometer**

Mr. James W. Sewall, forest engineer and timber cruiser, with offices at Washington, D.C., Old Town, Maine, and Sanford, Florida, states that hitherto the intensity of demand for services such as he

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**LETTERS TO THE EDITOR.**

The Canadian Forestry Magazine assumes no responsibility for, and does not necessarily endorse, the opinions expressed by correspondents.

**PLANTING SEED FOR REFORESTING.**

The question of Reforestation in Ontario is one that has received the attention and study of a great many of our leading citizens. Considering the extent of the lands of North Western Ontario that are

suitable for growing timber, but not suitable for agricultural purposes, and considering further the vast stretches of these lands that have been burnt over and laid waste by fire within the last twenty years, the question of reproducing a forest, of merchantable timber is certainly one of the most pressing questions that could occupy the attention of our Government. The plan for reforestation adopted in most European countries, is replanting, although some of the countries have adopted seeding. In Ontario, considering the

great extent of the burnt over lands that need attention in this respect, the question of re-planting, if it is expected to reclaim even a very small portion of the waste land, is out of the question on account of its cost and the difficulty of getting sufficient labor to re-claim anything but a very small percentage of the lands laid waste every year.

After having studied this question for many years and I lived more or less in this country and in the pine forests for forty years, I have come to the following conclusions:

That re-seeding is the only practicable way in which even a small portion of these lands can be brought under the growth of **pine trees**, but in order to re-seed, the ground must be prepared in some way for the reception of the seed. Just after a fire, and before the annual plants have covered the ground with their growth and debris, seeds sown will grow and produce a forest every time, but when some years have elapsed after a fire has swept over a section of country, the pine seed not being able to get to the soil, will not grow, as pollen from the poplar, Balm, and other trees will drift with the wind for miles, the land is soon overgrown with these almost useless forest trees. After a fire, where the soil has been made bare, it is an easy matter to re-seed. There are about 4,500 pine seeds to the pound, and one pound will pretty well seed an acre of ground, and after a fire, where the soil is exposed, three men would sow several acres per day, but where the vegetable growth of weeds and other refuse has covered the ground, the soil would have to be prepared, but in every part of the burnt over districts there are patches that would only require to have the soil disturbed with a hoe or rake, and in this way smaller patches of trees could be produced that in time would re-seed the larger areas. To figure out the cost of re-seeding, I may say that a number of years ago, when I was in the Ontario House I brought a proposition before the Department, to provide 100 pounds of White Pine seed which I agreed to have sown, under my own supervision, in different parts of Western Ontario to prove that this theory was practicable. At that time I was a member of the American Forestry Association and much in correspondence with Mr. Gifford Pinchot, who was then Chief Forester of the United States, and he offered me one hundred pounds of white pine seed for \$3.75 per pound, at Washington. My little scheme fell through as I could not interest the Government sufficiently in it to induce them to get the seed for me. I understood at that time that an abundance of seed could be obtained at all times for \$4 to \$5 per pound. In connection with this I might say that all the forests that have yielded all the pine timber and lumber on this continent were produced

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by natural re-seeding, which is very much more uncertain than would be artificial seeding, for the reason that white and red pine trees seed only about every five years and if the fire which cleared the soil occurred before a seed year the ground would not be in proper condition to receive the seed and there would be no result therefrom. All the pine forests have been produced when fires ran over the ground on a seed year, or one year before, but from the above you can see this was a slow and uncertain way of reproducing a forest.

In addition to the above, I might suggest that all fire rangers be instructed, in seed years, to use mattocks or hoes and prepare patches of ground under the large trees that would be loaded with seed. Then you would have natural reforestation with the aid of artificial preparation of the ground. This would be the cheapest way of reproducing the forests but as many of the areas are now covered with poplar and jack pine trees that have attained a considerable growth, it would be quite a laborious job to clear any very great spaces around the big pine trees that have remained after the fires, and that could in this way be utilized for re-seeding, but small patches of ground could be found near all seed trees that could be prepared in this way and the result would be in every case a good crop of pine. Also, the fire rangers could be instructed, and for this purpose their numbers augmented. During the months of September and October they could be provided with seed and instructed to prepare the ground in patches and sow the seed. This would be a cheap way of getting numerous patches over large sections reforested every year. In addition to this, every fire ranger will have noted that in thousands of places a few small pines that have germinated are struggling to get their top out to the sun, but are being smothered by the more worthless forest growths that spring up more quickly, and grow much faster in the start. By carrying an axe the fire rangers could cut down a tree or a few bushes that are smothering a pine and give it a chance to get its crown out to the sun, after which it would be able to hold its own. Trees saved in this way would in time become seed trees and while the forest, in this way, would come back very slowly, it would certainly, at a minimum cost, materially help the bringing back of the pine forests.

White and Red Pine trees will not grow and flourish in a shade—they must have their tops out to the sun. The writer has had occasion, at various times, to study the condition of our natural forests, how they produced, etc., etc., and to give a case in point: A forest on Muskeg River was examined. The soil was white clay, with clay loam on surface; the land was

generally dry and rolling. On this section on twenty or thirty square miles there was a dense ninety-year old forest of Poplar, Balm, Birch, White Spruce, Jack Pine, Balsam, and in low places Black Spruce and Cedar. The height of this forest was about eighty feet, and scattered through it there were a few very large white pine trees, 4 or 5 to the acre. These towered 70 to 90 feet above the under forest, and were about 250 years old. Now the examination proved, **first**, that

the area was originally covered by a forest of white pine; **second**, that the forest was about 150 years old, when the fire that destroyed it occurred; **third**, that it was a fall fire (August or September); for the ground must have been exceedingly dry and the forest floor littered with inflammable material; **fourth**, a considerable number of the trees were not killed—their tops being so far from the heat that they were not scorched. **Fifth**, it not being a seed year for Pine, the ground

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was seeded with other varieties of trees, and when a pine seed year occurred the seed could not get to the soil; and there was therefore no secondary forest of pine; hardly a secondary pine tree in the whole area—examined—with one exception. One of the large pines had been struck with lightning when the second forest was about 40 or 50 years old; this fire had burnt over about one or two acres, and as this had occurred on a pine seed year the result was a dense growth of pine covering the burnt over area. Other-

wise, in all that section, there was no evidence that a secondary growth of pine had been produced, notwithstanding the fact that thousands of large pine trees had been showering their seed on the ground for over one hundred years.

W. A. PRESTON.

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W.A.P.



**JAMES SMART PLANT**

**Brockville, Canada.**

## SHADE TREE REPAIRS.

(Concluded from page 424.)

comparatively dry. It is not permanent, however, and if used on a surface slow to cover, should be applied yearly until the wound heals.

An application of thick coal-tar makes a more satisfactory covering than paint, and sometimes one application is sufficient. It must be kept under observation, however, and if there is any indication of cracking or peeling, a fresh coat should be added. If desired, the disinfecting and water-proofing may be done in one operation by first mixing the creosote and coal-tar in the proportions of one-fourth creosote to three-fourths tar.

Asphalt has in recent years come into considerable use as a protective covering since it is less likely to crack and peel than coal-tar. To be used the asphalt must be mixed with some solvent, such as creosote, gasoline or other mineral oil. The asphalt is first melted over a fire and then removed before stirring in the oil to avoid the chance of it catching fire. Sufficient of the solvent must be used so that the mixture will be somewhat thicker than paint when cool. It is best to prepare a small trial mixture and allow it to cool to air temperature before making up a large quantity. Asphalt without solvent is sometimes used, but it is necessary to apply it hot. It should therefore be used only where the heat will not injure the living tissue of the tree, as on the interior surface of large cavities. Apply hot asphalt with a cloth swab.

Grafting-wax in liquid form is good for coating small surfaces but it is too expensive for use on large wounds. It may be made by melting ordinary grafting-wax and stirring in half the quantity by weight of alcohol. Or it may be made by melting one pound of white resin with one ounce of beef tallow and after removing from the fire, adding eight ounces of alcohol. It should be kept corked.

## FROM THE GRAIN GROWERS !

Here is a typical opinion of the Canadian Forestry Association. It comes from the United Grain Growers, Winnipeg.

"The Directors appreciate the splendid work which is being done by you and are individually doing what they can to assist.



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Quotations on Request

## The Aeroplane's Service to Forestry

(Concluded from page 419)

### Object Detection.

The principal object of the patrol trips was, of course, to be detection of fires and the round trip taking upwards of three hours covering over 300 miles. Figuring an average visibility of 20 miles meant the actual covering of around 3½ million acres, or about 20 per cent of the whole district and including that portion where due to weather and risk, past experience shows the fire hazard is greatest. The Sunday patrol trip was considered to be particularly desirable, in that over the week end all camps are closed down and thousands of tourists and city folk are scattered in outlying points on pleasure trips. The hazard curve in consequence goes up and on account of the closing down of the rural telephone and telegraph, quick detection and reporting is hampered.

### A Plan for Fire Fighting.

In addition to the regular patrol, allotment was made available of a portion of the flying time for emergency trips for fire fighting. The big F-3 machine was to be used for this work and a set of fire fighting tools with a portable gasoline fire pump were gotten ready to stand by, and a picked crew of fire fighters organized in advance. These arrangements were made to enable us to try out the aeroplane for actual fire fighting work for the transportation of a small picked crew as occasion arose to some fire, which was so located as to be hard of access by other means, for instance at the head of one of the long inlets on the mainland or high up on the mountains where no roads or trails existed but which could be reached with a plane landing on the inland lake. In the past, thousands of dollars have been spent cutting trails and fighting a way into a fire before any actual fire fighting was possible. One particular case occurred last year where over a thousand dollars were spent cutting a trail into a fire before any fire fighting could be started and where, if a plane had been available, five or six men with a pump could have landed on a small lake within 2 miles of the fire a few hours after discovery, and the fire fought and brought under control when still small. Fortunately or unfortunately no favorable opportunity presented itself this season to try this out in actual practice.

A trained Forest Officer accompanied each patrol trip so that in case of discovery of a fire, communication and transportation of the ground staff could be coordinated to best advantage after detection.

### Supervision of Fires.

A portion of the time allotted to Forest Protection was held in reserve for special

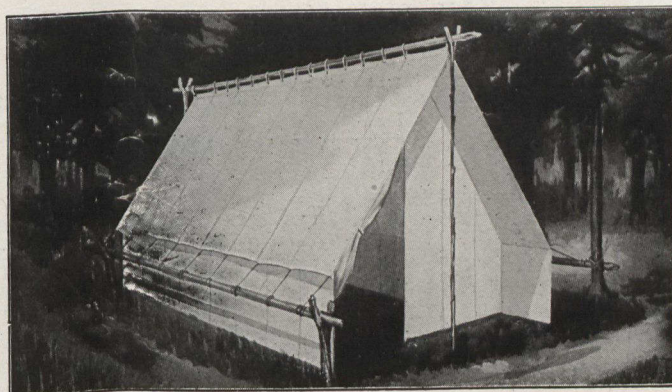
trips of supervising officials. In fighting forest fires, particularly in the height of the season, conditions sometimes arise where a ranger has to detail assistants and at times temporary employees to take charge of fires. This happens when a number of fires break out simultaneously. In such cases the expenditure of considerable sums of money and the handling of serious situation may be under direct control of untried men. At such times it is

of untold value to be able to transport a fire protection expert to the scene of a number of fires so that he may size up the situation, reduce or increase the fire fighting staff and advise on plans of attack. Lack of judgment on the part of men in actual charge of fires is often very costly, as untried foremen have it in their power, should they lose their head at critical moments, to waste considerable sums of money before an experienced officer can get on the job. One such case might mean the saving of sufficient money to pay for a good deal of flying.

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**Administration.**

Plans were laid as well for utilizing a portion of the flying time available for experiment in general administration work.

One trip of inspection and supervision was planned to cover the whole district once a month so that the chief executive or his second in command could keep in immediate touch with field conditions in outlying sections where no other means of transportation was possible. A certain amount of time was also allotted for special trips and for experimental work, amounting in all to about ten hours flying.

**Research Work.**

After Fire Protection, one of the chief functions of the branch is that of research. Investigations are being carried on to determine what is actually coming on in the way of a new crop of timber on cut over lands, also the rate of growth which is occurring in these stands of reproduction and young timber in order to establish the relationship to our present rate and expected rate of exploitations and a future supply. Stock taking to find what we have actually got in the way of capital stock of timber is another phase and the use of aeroplanes was planned to a lim-

ited extent to assist in the research work being undertaken.

Twenty-five per cent (25%) of the available flying time was, therefore, allotted to reconnaissance work and for the mapping of cut-over and wind-blown timber and spotting of areas of young growth for the ground crew employed on investigation work. A definite photographic survey of an uncharted section of the Upper Powell River was also planned in lieu of an arduous and expensive ground reconnaissance which would be otherwise necessary.

**Difficulties of Mountain Flying.**

The past season has not been ideal for flying generally speaking. During the fine weather in June, July and August, fleecy clouds were encountered almost daily at high altitudes when cruising any distance inland or near the higher ranges. This year being the first that any extensive operations were carried out on this coast, conditions new to the experience of pilots who were used to flying in the East and Overseas, were encountered. Mountain flying on this coast is coupled with weather and air conditions found nowhere else and naturally many features of the work presented problems to be solved. Straight flying for transportation purposes is simple work in any temperate climate anywhere except for fog. There was no difficulty on this score but for photography, air movements, cloud conditions and light conditions in mountainous districts presented new problems to be solved. The visibility has been exceptionally good this year due to the absence of drifting smoke and haze during the hot season. Not for many years had the air been so free from haze as this year throughout the whole province. In the main no serious difficulties were encountered which would tend to prevent successful operations.

**Results this Year.**

A total of 64 flights were made this season in the interests of the Forest work. The total time in air for these flights was 95 hours, 35 minutes. The total miles flown was over 8,500 miles, which figured at a mean visibility of twenty miles, ten miles on each side of this line of flight, would mean a total area covered of 100,000 square miles of country.

Twenty-eight flights were made on Forest Protection work.

Fourteen flights on Administration and fourteen flights on Research.

Aeroplanes covered 5,000 miles on fire patrol and fire supervision.

Twenty-one new fires were located on twelve of the patrol trips. On the remaining 16 trips no new fires were spotted and conditions were reported safe.

One trip of inspection was made after the last rain in June with the object of making sure that all fires resulting from the burning of logging slash were actually out. On each trip the majority of known

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fires were inspected as to progress in burning and officers in charge of the fire were taken up to examine the lay of the ground. The result of one of these trips was that 75 per cent of the fire fighting crew were immediately taken off the fire here as it was determined that natural barriers surrounding the fire rendered it unlikely to do further damage.

Three fires on Vancouver Island were discovered one Sunday and as a result crews were put to work that day and fires reported safe next day. As all commercial telephone and telegraph were closed down that day and as the fires were in out of the way locations, it is doubtful if they would have been discovered and reported until they had at least another day's start, which would have meant heavy extra expense.

At Theodosia Arm a fire was discovered by the Patrol which on account of being in a very out of the way place would probably not have been discovered until after it had assumed large size. It was completely extinguished the following day.

Recurrences of the Menzies Bay and Half Moon Bay fires were discovered in time to be checked. The ground patrol in the immediate vicinity had not seen them.

Assistant District Forester Stuart in charge of Fire Protection says, "The Flying done this Season has effectively demonstrated the value of aircraft for fire patrol on this Coast when handled properly."

**Administration Flights.**

Four trips of inspection and supervision were made by supervising officials of the District office. A good number of the field staff were visited on these occasions and matters of importance taken up and disposed of which had to be handled in person. A closer touch was established with the field than was ever possible before or could be accomplished by any other means.

Three trips of inspection were made by Victoria head office officials and a thorough inspection was made of mechanical equipment in the field as well as the operation of the Launch Repair Station and wireless telephone shore stations. The value of this in raising the general tone of work in the organization is incalculable. The effect of personal supervision of a superintendent in a factory is generally recognized in its effect on the organization. In no less degree is its effect felt in the Department's organization, but the difficulties attending such supervision where the organization is spread over such a large area are a hundred times greater, which indicates the peculiar value of the aeroplane in our work. One trip of inspection might be described briefly. The party including the Chief Forester, District Forest and Assistant Supervisor of Scales left Vancouver one morning about 10 o'clock. The plane landed at Thurston

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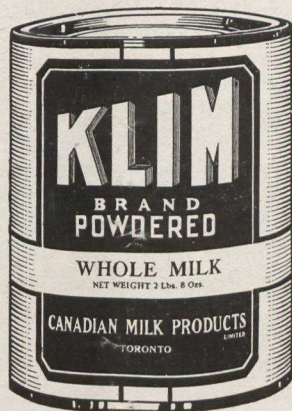
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Bay at noon, a distance of 120 miles, when the District Supervisor and a number of the Rangers were met by appointment. After lunch the party proceeded to Drury Inlet, a further distance of 100 miles, where two logging operations were inspected and two field officers consulted on an important matter. After a two hour stop the party flew to Quatsino on the other side of Vancouver Island almost at the extreme north end. Some business of importance was transacted and local officials interviewed and a return flight made to Alert Bay where the party spent the night. Total miles flown for the day—400 miles. Notes were made on the trip over a strip of country which was badly damaged by a windstorm some years ago. The next morning the party left Alert Bay and lunched at Thurston Bay, making an inspection of the Repair Station and Hydro Electric plant. The return trip was made to Vancouver that afternoon. Total distance covered 600 miles, total time flown, 9 hours in two days. The time required to make this trip by ordinary means of travel would be not under two weeks.

#### Estimating Damage.

The first undertaking this year of reconnaissance work by aeroplane was a survey of the damage caused to Vancouver Island and Mainland timber by the great wind storm of January 29th, 1921.

Thirty hours flying was done on this work and practically the whole of the five million acres of timberland affected were covered. Results of this reconnaissance were checked up in two of the areas most

affected by a party of cruisers on the ground, and the aeroplane reports found to be approximately correct. Omissions occurred on the first few trips due to the inexperience of the observer, but in the end a very comprehensive survey of the situation as a whole was obtained. It was found that first reports of the damage were greatly exaggerated. It was found that on the whole five million acres affected carrying a total stand of timber in the neighborhood of one hundred billion feet, less than one quarter of one per cent of this stand had been damaged on the whole, and the total loss suffered was not over 200 million feet of timber. This will, of course, be in excess of the average annual depreciation due to windfall but as a part will be salvaged, is not excessively alarming. To have covered this area by ordinary methods would have taken months and would have cost thousands of dollars.

A similar undertaking was carried out on the Olympic Peninsula about the same time. Aeroplane reconnaissance there showed a vastly greater damage done, according to a U.S. F.S. report. A total of twenty-three and a half hours flying was done on the wind-damaged area in Washington. The total area covered was 2,200 square miles. Three hundred and fifty-four photographs were taken and an estimate made of the damage done. The total figures obtained as a result of this reconnaissance was that approximately six billion three hundred million feet of timber had been blown down, which would approximate about three times the total yearly cut of the whole of this Province.

During the season on a number of the flights, lumbermen and other business men were taken along as passengers where space permitted. I think the general conclusions arrived at by Department officials are backed up by the majority of those men who have seen for themselves.

It is my personal opinion that the aeroplane in Forest Work has proved its usefulness along certain definite lines. It is my opinion also that past results justify further experiment along certain lines and full support and encouragement for the development of exact technical work such as extensive surveys and reconnaissance.

For quick transportation to enable inspection and supervision in any business whose interests are scattered over a wide territory where commercial lines of transportation are not developed, the aeroplane has proven that it is reliable, efficient and economical.

For quick transportation in emergency where loss of time is costly and liable to be disastrous, the aeroplane has no rival.

Given time locomotion by air is coming as came the steam locomotive and the automobile, nothing can stop it. This might as well be recognized first as last. It only requires development and the backing of public opinion. Forest work will be one of its useful fields. The solution of the Forest Fire problem in the country depends to a large extent on the development of mechanical appliances for fire suppression, the portable pump, etc. Prevention is the best cure brought about by public recognition and public backing for the conservation of a great exhaustable natural resource.

## Experience with Tree Seed on Our Prairies

Doopmore, Manitoba, June 16th, 1921.

The Editor "Canadian Forestry Magazine":

I read with interest Mr. Otto Schico-beck's article in the April number. Here in Western Canada conifers were badly injured during the winter of 1919-20. Some people were of the opinion that this injury was caused by a blight disease, but it is my opinion that the main cause of injury was the lack of hardiness in the trees affected, and I think the following notes on the behaviour of some of my conifers will bear out my contention.

*Abies balsamea*, grown from commercial seed secured in the United States and probably collected in the east, only one specimen came through uninjured, four others were badly injured but grew from the terminal shoot; the balance were cut to the snowline and in some cases outright.

*Abies sebirica*, seed secured from Johannes Rafr, collected in the Urals;

the largest specimens were about 20 inches high and were uninjured though one of them was growing within three feet of a specimen of *A. balsamea* which was killed outright.

*Abies concolor*, from Colorado seed: this beautiful conifer kills to the snowline with me every winter; it showed no more injury than usual.

*Picea alba*, of unknown origin, quite uninjured.

*Picea nigra*, native, also uninjured.

*Picea excelsa*, from commercial European seed: a small percentage of these proved hardy and are now from six to ten feet high; these came through uninjured.

*Picea excelsa septentrionalis*, from Finnish seed, a large proportion of this form proved hardy and though some of them had the terminal growth injured the majority started from the terminal bud.

*Picea obovata*, Siberian seed: these were about two feet high and showed no sign of injury. This is a very promising

spruce and is now making growths of over eighteen inches annually.

*P. pungens*, commercial seed from U.S.A., said to be collected in Colorado: practically all of these showed a certain amount of injury, more especially those which had just the previous year's growth above the snow; most injury occurred near the snow line and extending from 6 inches to a foot above and below that line.

*Pinus flexilis*, commercial seed collected in Colorado; these were about 2 feet high and only one came through uninjured, the balance had their leaders destroyed.

*P. Banksiana*, commercial seed from U.S.A., these were from three to five feet high; only one came through uninjured, the balance were killed to snowline.

*P. Sylvestris*, commercial seed bought in Canada, these were from six to twenty feet high; some of these were killed outright while others were more or less injured; several have started into growth again after losing practically all their leaves.



## Two Even-aged Stands in New Brunswick

W. M. Robertson, Forester, Dominion Forestry Branch.

*P. Sylvestris*, this form came through quite a bit better than the former and a number of specimens were uninjured.

It will be seen from the foregoing that even native conifers, when grown from seed which has probably been collected in Eastern Canada or the Eastern States can not be relied on with us here but at the present time it is impossible to secure seeds of native conifers which have been collected in the West, the demand at present is too small to make the collection of these seeds a paying proposition.

The Forestry Department does collect a certain amount of conifer seeds, but only for its own use.

It is more than likely that a number of interesting trees of North Eastern Asia such as the White Oak, Basswood, and Elm of Mongolia, the Manchurian Maple, Ash, Cork tree, and Pear (*Pyrus ussieniensis*) would also prove hardy and valuable trees here provided we could secure seeds from the colder parts of their native habitat.

My experience with the latter of these trees may prove of interest, quite a number of years ago, I secured seeds of *Pyrus ussieniensis* from Johannes Rafn, and raised several hundred seedlings, most of these were killed the first winter, while the balance were completely destroyed the second winter. During the autumn of 1918 I secured scions of *P. ussuriensis* from the Arnold Arboretum and now have a fine grafted tree which at the time of writing is over five feet high and gives every promise of being thoroughly hardy. I also have a hybrid of this pear with one of the European pears (Hansen's No. 18) which is very promising; this tree was slightly injured by sunscald during the winter of 1919-20 but came through the past winter absolutely without injury.

F. L. SKINNER.

### KEEP FORESTS GREEN.

If Canada's forests are kept green the result will benefit our lumbermen, farmers, manufacturers, merchants, railways, ship owners, and, above all, our workingmen. If the forests are destroyed this destruction will leave much of the land a barren desert. It will dry up our streams and injure every person in Canada, no matter what his business.

### FALL SEED CATALOGUE READY.

Our readers will be interested to learn that the Fall, 1921, catalogue of Messrs. Kenneth McDonald & Sons, Ottawa, Ont., is off the press and ready for distribution. The seed annual for 1921 is also available and is a beautifully illustrated book which should be of interest to gardeners and horticulturists throughout the country. We understand that both these publications can be had for the asking.

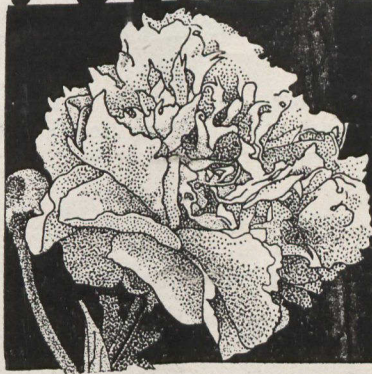
A comparative resumé of the growing conditions found on two stands of timber, the one following the Great Miramichi fire 95 years ago, the other on lands burned over 35 years ago may be of interest and value in assisting to determine the most profitable age at which to cut such stands.

The Miramichi fire burned over 6,000 square miles of timber lands in 1825.

Growth studies show that nature promptly set to repair the damage and a new crop of spruce, balsam, pine and cedar, birch, poplar and maple started within a few years. The new crop was evidently a full one, indeed so full that almost no reproduction started after the first decade.

Within this area numerous patches of several square miles each, lying along the

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Festiva Maxima—snowy white with crimson markings	-----	.60
La Tulipe—lilac white with crimson markings	-----	.75
L'Indispensable—delicate shell pink	-----	.75
Madam Forel—clear bright pink	-----	1.00
Mins. Jules Elie—shell pink	-----	1.00
Marguerite Gerard—delicate salmon pink	-----	1.25
Solfatare—yellow	-----	.75

\$9.10

To readers of Canadian Forestry we will send this assortment of ten choice peonies for \$8.00

Carriage charges prepaid.

Nipisiguit river, were burned over a second time between 30 and 40 years ago. On them nature came to the rescue again, producing another crop of spruce, balsam and pine, birch and poplar within one decade. Thus are found, side by side on the same type, two even-aged stands, one 85 to 95 years old, the other 25 to 35 years old.

For each of these areas representative stand tables and growth studies have been obtained. The old or first stand was cut to an 8-inch diameter limit in 1920 yielding, from 139 trees, 1,025 cubic feet or 11.4 cords per acre. The largest number of stumps in a single diameter class was 31 of 9 inches (8 inches D.B.H.). There were less than 16 in any class above 9 inches. More than 75 per cent by numbers or 58 per cent by volume of the cut was less than 9 inches D.B.H. The spruce now standing are: 95 free trees, and 43 suppressed trees, having a total volume of 342 cubic feet or 3.9 cords.

The following table shows the composition of the two stands immediately previous to the cut:

	Spruce.		Balsam.		Pine.		Poplar.		P. Birch		Others.		Total.
	No.	p.c.	No.	p.c.	No.	p.c.	No.	p.c.	No.	p.c.	No.	p.c.	
First Stand	363	54	29	4	--	--	74	11	167	25	31	6	664
Second Stand	158	24	176	27	37	6	151	23	134	20	--	--	656

In the first stand 38 per cent of the spruce, 12 per cent of the balsam, 30 per cent of the poplar and 8 per cent of the birch were dead. The number of dead trees that had decayed beyond recognition can only be surmised. They would probably be at least half as many more.

In stand number two, however, there was no mortality except in the poplar of which 12 per cent was in a dying condition. This mortality economy in the younger stand should not be overlooked.

The shortage of balsam in the first stand is very probably due to an attack of spruce budworm which swept the area some thirty years ago.

The two stands were about equal from the point of numbers and reproduction conditions. In the first stand the largest number of trees was found in the 6-inch diameter class in every species except poplar, which culminated in the 8-inch class. The 2-inch and 3-inch classes were almost absent since the stand was even-aged without recent reproduction. A similar condition obtains on the second stand where the culminating diameter classes are balsam 1-inch, spruce 2-inch, pine 3-inch and birch and poplar 5-inch.

**When Growth Occurred.**

Growth studies reveal that 75 per cent

of diameter growth occurred on stand No. 1 during the first 50 years, after which accretion was remarkably slow. It required 25 years on the average, to produce the last inch in diameter.

On the other hand, the spruce on the second stand is growing at the rate of one inch in six years. The breast height diameter of the average spruce is 2.8 inches, of the average balsam is 1.9 inches. If the present rate of growth should continue for twenty years the diameter of the average spruce will be 6 inches which is the culminating diameter of the first stand.

In the second stand there are now 45 spruce in the 3-inch class, 30 in the 4-inch class and 10 in the 5-inch class. Twenty years hence these should have reached the 6, 7 and 8-inch classes respectively and should yield a merchantable volume of 497 cubic feet or about 5.6 cords.

The balsam are younger and smaller. There are now 21 3-inch trees and 6 4-inch trees which should be in the 6 and

7-inch classes twenty years hence with a volume of 137 cubic feet or about 1.5 cords. Both species should yield over 7 cords per acre.

These calculations do not take mortality into account. Since the stand is even-aged young and thrifty there is little likelihood of loss by wind. The balsam is still too young to be very susceptible to the spruce budworm. But if the entire balsam and pine stock be considered to represent the mortality there will still be a cut of nearly six cords per acre when the stand is fifty years old.

The deductions from the foregoing comparisons are that the most profitable time to harvest the crop from the second stand will be at an early date after its fiftieth year, before the closing crown cover and shortage of soil nourishment seriously retard growth, and before mortality makes material inroads into the stand.

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The Canadian Pacific Railway has established a Bureau of Canadian Information as a branch of its Department of Colonization and Development, with the object of disseminating reliable and up-to-date information as to agricultural and industrial openings in all parts of Canada.

### WESTERN CANADA FARM LANDS

The Company has yet for sale several million acres of choice farm lands in Western Canada, at low prices and on long terms of payment. In certain districts lands will be sold without settlement restrictions, but the Company is prepared to grant special concessions to those who will settle upon and develop their farms.

### IRRIGATED FARM LANDS

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Lists of selected improved farms, available for settlement in Ontario, Quebec and the Maritime Provinces, with the names and addresses of their owners, may be obtained on application at any office of the Department.

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Investigations, looking to the utilization of undeveloped natural resources and waste products and new industrial processes, are being carried on by the Research Section of the Department. Inquiries as to promising fields for investigation in this connection are invited.

### INDUSTRIAL OPENINGS

Reliable information as to sites for new industries in all parts of Canada, and of special business openings in the growing towns and cities along the lines of the Canadian Pacific Railway in both Eastern and Western Canada, will be gladly furnished on request.

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Well equipped Canadian reference libraries have been established by the Department at Montreal, New York, Chicago, and London, England. These libraries contain the fullest information on all matters relating to Canada and her undeveloped resources, and are kept supplied with the latest information pertaining to new developments through the medium of a news service organized through the co-operation of the other departments of the Company's service. The information on hand in these libraries is available without charge to those interested, and inquiries addressed to any office of the Department will receive prompt attention.

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