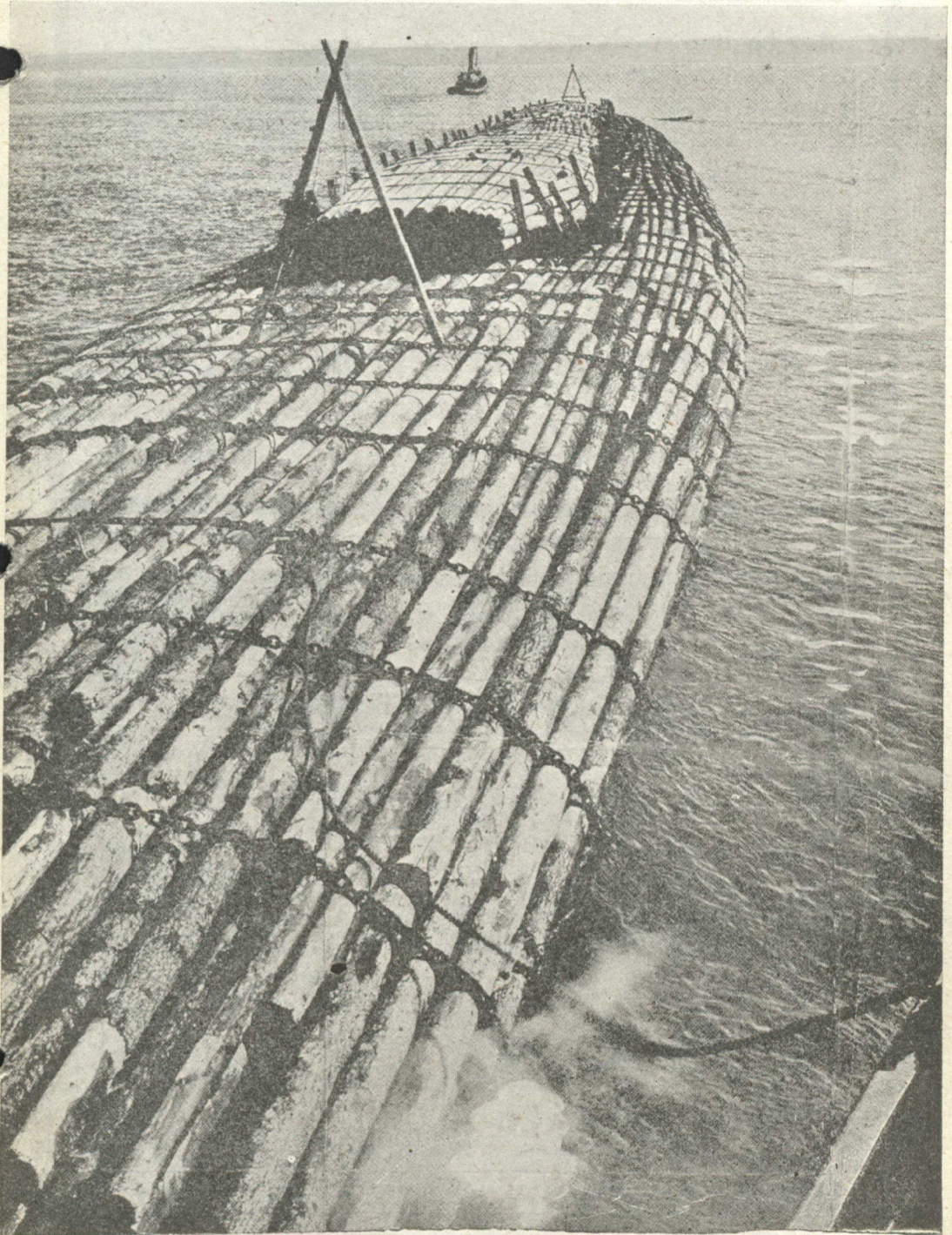


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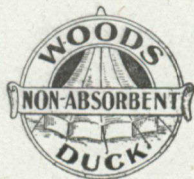
No. 7



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ROBSON BLACK, Editor.

Vol. XIV.

WOODSTOCK ONT., JULY, 1918

No. 7

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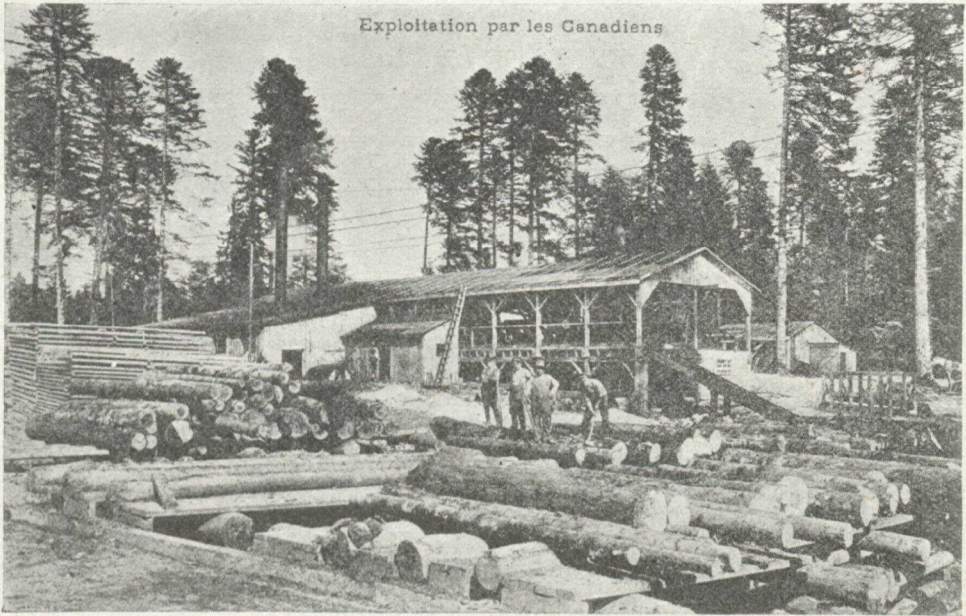
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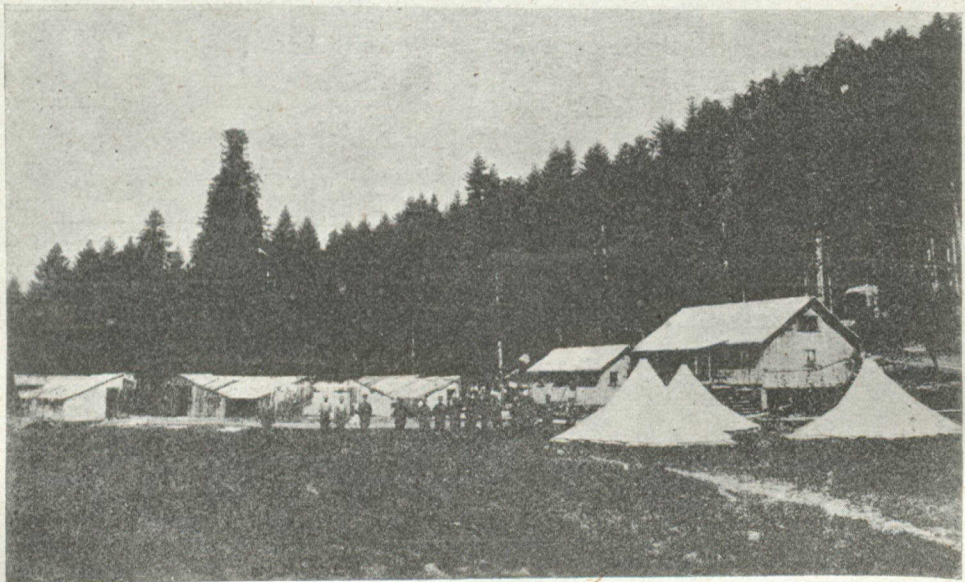
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A Canadian Forestry Battalion Saw-mill in the Jura Mountains, France.



Canadian Forestry Battalion Camp in the Jura Mountains, France.

Bringing Back the White Pine Forests

By R. H. CAMPBELL, DIRECTOR FORESTRY, OTTAWA.

A Striking Discussion of the Factors Helping and Hindering the Growth of Perpetuation of Pine.

In spite of the value to which spruce has climbed in recent years and the dangers to the white pine which are threatened by the white pine blister rust and other evils the fact remains that over a great part of eastern Canada the white pine is the best tree to grow while it is the most distinctive and well-known timber. Its reproduction is therefore a matter of great interest and one well worthy of careful study and observation. But at the outset it should be recognized that the problem is not a simple one and is not to be solved finally and satisfactorily by opinions based on superficial observation or experiments, but will require years of careful management and balancing of the various influences that affect regeneration to decide what is the best method to follow and how it should be modified to meet changing conditions. Government forest experiment stations which will carry such experiments through to a conclusion are absolutely necessary if the proper methods are to be worked out and understood. With the cooperation of the Honorary Council for Scientific and Industrial Research a forest experiment station is being organized by the Dominion Forest Service at Petawawa in a typical pine region of Ontario where the systematic study of conditions following lumbering for pine and the possibility of bringing about its reproduction will be carried out.

A Complex Problem

In the meantime the question may be discussed from the general knowledge of the habits of the white pine and of the methods followed in other countries with species of the same general characteristics. The first thing that strikes the attention in studying the methods followed in

other countries is that the problem is not a simple one but a complex one and varies with every varying condition as to soil, moisture light and mixture of species. To quote Professor A. Jolyet of the Forest School of Nancy in his work on Silviculture:-

"A forest is not, like a field of wheat, a simple group of individuals of the same species growing side by side to the time when the bushman decides the fit time has arrived to use the axe; forest species, with requirements often the most diverse, find themselves growing together and from birth to old age they not only increase in size but they modify their wants not only according to the physical condition of the soil which bears them, or according to the space which is allowed them; they themselves, increasing in size or shedding their foliage, have a considerable action on the soil, upon the quantity of light which they allow to pass to it; upon the debris which they give to it; always in a struggle with one another they lend themselves or oppose themselves to the existence of a whole population of trees newly arrived, of shrubs, of low plants or of animals which in their turn react upon them."

The white pine is a tree suited to light, well drained soils and such soils are the ones that should be devoted to its production. Not that it will not grow on richer soils as the finest pine known was that growing on good soil amongst the hardwoods, but these lighter soils are the ones available for forest purposes to which the pine is best adapted and on such soils it should be favored in every way.

Handicaps on Germination

What have been the results of some of the operations that have

been carried out in previous years? The pine amongst hardwoods generally dominated the stand, but when it was cut out the hardwoods held the ground. Their shade prevented germination of the pine seed or the development of the tree, if the seed did germinate. The result was that the forest became a hardwood forest and there is no evidence left of the existence of the pine except the old stumps or an occasional young pine that has happened to have special circumstances in its favour in a particular spot. In some pine forests the understory was of spruce and fir, both of which germinate and grow better under shade than does the pine, and when the pine was cut out the understory became the forest and the pine had no opportunity for reproducing itself in such adverse circumstances. In many cases these results may have been satisfactory to the interested parties but in a study of the possibilities of the natural regeneration of white pine the cases are significant. They show that the problem is not a simple one for even if the pine had not been taken out in the circumstances indicated and was left to produce and scatter seed it would in time have been vanquished by the understory unless a fire or hurricane had come and opened up a space to light where the seeds could germinate and the seedlings grow.

The pine is firm rooted and can therefore stand isolation without danger of windfall better than some other species and while it requires light its demands in this respect may be considered as moderate. It would therefore lend itself to a system which would permit of the opening up of the stand of timber to a considerable extent.

Systems of Cutting

There are several main systems on which cutting is carried out. One is the clear cutting system in which all the pine is taken off the ground. This system might be followed where the stand of pine is mature and fairly even-aged, but in order to secure the reproduction of pine several things are necessary. There

must be a stand of young pine on the ground ready to take the place of the old or provision must be made for a supply of seed before the old trees are all taken out. If the cutting is carried out after a good seed year there may be sufficient of a supply of seed fallen which, germinating in the light and warmth of the uncovered ground, may furnish a satisfactory stand for establishing a new forest. If not then some of the pine must be left to furnish seed. But these must be left with reference to prevailing winds and the distance to which seed will carry. The pine seed furnished with a light wing and borne high in the tree in the long pendant cones will carry for long distances, but the proper distance within which a sufficient seed supply will fall must be determined by observation in different districts. If, however, the ground is covered thickly with pine needles when the seed falls it may never reach the soil and get a chance to germinate and grow. With the too full opening of the ground, the grass may get a chance to grow and in a struggle with grass the pine has not much chance. If, however, the new growth is light, shrubs and such trees as poplar and white birch, the pine may be expected to hold its own and to overtop the others in time, and it may do this with the heavier shaded hardwoods if they get away to anything like an even start.

If, however, when the pine is removed, the ground is shaded by a dense covering of hardwoods or of spruce and fir, the chances for the germination and growth of the pine are almost nil, and to ensure pine reproduction they would require to be removed at the same time as the pine.

Local Conditions Mean Much

The system most discussed in Canada, however, and the one supposed to be indicated by the diameter limits for cutting set by the several governments is the selection system, the system by which a selected number of trees are taken out and the remainder are left to increase in size and to furnish a seed supply. But this system, even though carefully



In a White Pine Forest at Madawaska, Ontario

followed, does not furnish all the conditions necessary. The soil and light conditions may not be satisfactory. Here the presence of some broad-leaved trees, the fallen leaves of which assist the disintegration of the pine needles, will assist in preparing the soil. And the light conditions required for germination may be secured by making heavier cuttings scattered through the area of operations or the cutting generally may be made sufficiently severe to open the soil up fairly well to the light. What size of openings are to be made or how far the soil is to be exposed will depend a great deal on the nature and conditions of the soil and of the forest cover. Experiment and observation must determine the question and at the present time

only general indications can be given from a general knowledge of the manner of reproduction of trees and the habits of the white pine in particular.

A Task for Foresters.

Until the forester gets into active touch with the timber operations and has some authority in directing them so that observations will be made accurately and systematically and with due regard to all factors we will be working largely in the dark. It is by this method and by this method only that the forests of Europe have been brought to the perfection they have reached. It has taken time there. It will take time in Canada, but a beginning on right lines as indicated cannot be made too soon.

The Forests of Cyprus Coming Back

In ancient days Cyprus was no doubt rich in timber, and its mountain districts were clothed with trees varying with the altitude. In 1878, when Cyprus passed under British control, the condition of the so-called forests was deplorable, and it was clear that strong steps, aided by scientific knowledge and a Government Department, must at once be taken to remedy and stop the cause of destruction. An Ordinance was passed in 1879 for the delimitation and preservation of the forests; and successive Forest Officers sought to remedy some of the abuses by prosecution in the Courts, while the forest areas were gradually delimited and settled. They now extend to some 700 square miles.

The trees consist principally of the Aleppo pine, but, at an elevation of 4000 ft. and over, of *Pinus Laricio*. Large tracts are also covered with *Quercus alnifolia*, which is much in demand for making native ploughs and carts, while *Arbutus* flourishes in many places on the slopes of the hills and is used in the manufacture of rough furniture.

With very small sums voted an-

nually to the Department, protection was the only course open to those in charge; and no progress in artificial reforestation was made till many years after the occupation. Since 1907 special tree-planting has made considerable progress, some 300 miles of fire-paths have been made, and goats will gradually be excluded altogether by means of legislation passed in 1913 on the principle of local option for each village. The police protection has on the whole always been good, and there is no doubt that the forests of Cyprus are now in a fair way to recovery, and are likely to become an added source of beauty and prosperity to the island. It may be interesting to note in this connection that the rainfall appears of late years to have increased.

WILLOW TREES SELL HIGH

A farmer residing along the Credit River, Ontario, planted willow trees on the river banks thirty years ago. During the past month he was offered \$1500 for the willows as they stood. The purchaser was an agent of an artificial limb factory in Toronto.



White Pine Forest with an Understorey of Spruce, well illustrating the Tendencies of White Pine Areas when Cut Over to Come Back in Other Species.

Save the Soldiers from Profitless Lands

The danger that some of Canada's returned soldiers may be settled by Government commissions on lands wholly unsuited for agricultural communities is engaging more and more public attention. In the case of Ontario, Quebec, New Brunswick and British Columbia, it is comforting to note that only lands of proved agricultural possibilities are being opened to soldier-settlers. The importance of land classification by agricultural and forestry experts is recognized and practised in these provinces to a degree that promises

well for the land settlement policies of the future. In Ontario, for example, only the splendid agricultural soils of the Claybelt are being opened to the soldier communities. All future settlement will be similarly safeguarded, as far as organized colonies are concerned. There remains the danger so long persisting in Ontario and Quebec, with its attendant waste of human effort and its ill effects upon forest conservation, that sections of timber lands of doubtful agricultural value will continue to be thrown open to settlement, thereby creating all too

frequently a scattered, impecunious, ill-educated body of population.

Unless the deliberations of the Dominion Soldier Settlement Board recognize the prime necessity of selecting homesteads for soldier settlers on the basis of expert advice by technically-qualified soil examiners and foresters, the old blunders in Canadian settlement are likely to be perpetuated. The forester, of course, would not be called into council in regard to bare prairie lands. But in all instances where the Board proposes to take slices out of existing forest reserves or to open up forested country in any part of the Dominion, the advice of a professional forester is a first essential. There is a lively tendency for laymen to leap to the conclusion that any timber-bearing land will make good farm land. This has been responsible for enormous economic losses to the Dominion and a vast deal of human misery. Of the tree-covered areas of Northern Manitoba, Saskatchewan and Alberta, probably 75 to 90 per cent. is unadaptable to farming and should be maintained under timber. The settler who tries to up set Nature's fixed arrangement impoverishes both himself and the soil from which he hoped to get a livelihood.

AN INDIAN FORESTER'S EXPERIENCE

Few Canadian foresters or fire rangers are called upon to pass through the experiences which the Indian Journal of Forestry credits to one of the British forest engineers.

The forester was visiting a clearing in a Sal forest, and with approving hand was patting the young sal-shoots, when, raising his eyes, he saw a sambar within a few yards, gazing hungrily at him. There being no tree handy the forester didn't climb it. The officer ceased thinking of the girl he left behind him and concentrated his attention on the sambar. "Every now and then," he writes, "the sambar hammered the ground with his hoofs and his tail stuck up at right angles and looked as if it had been dabbed on as an after-

thought." A sambar is savage at any time, but when he has a perpendicular tail, it is up to any human in the vicinity to prepare for immediate dissolution. "Through a special intervention of Providence," continues the forest officer, "nothing happened. After looking me over for a little, the sambar lowered his danger signal and trotted off into the forest. He had, I fancy, recognized the service uniform, but he wasn't after me. I am young and slender, while the chief is old and fat. Apparently it was the boss the brute was laying for."

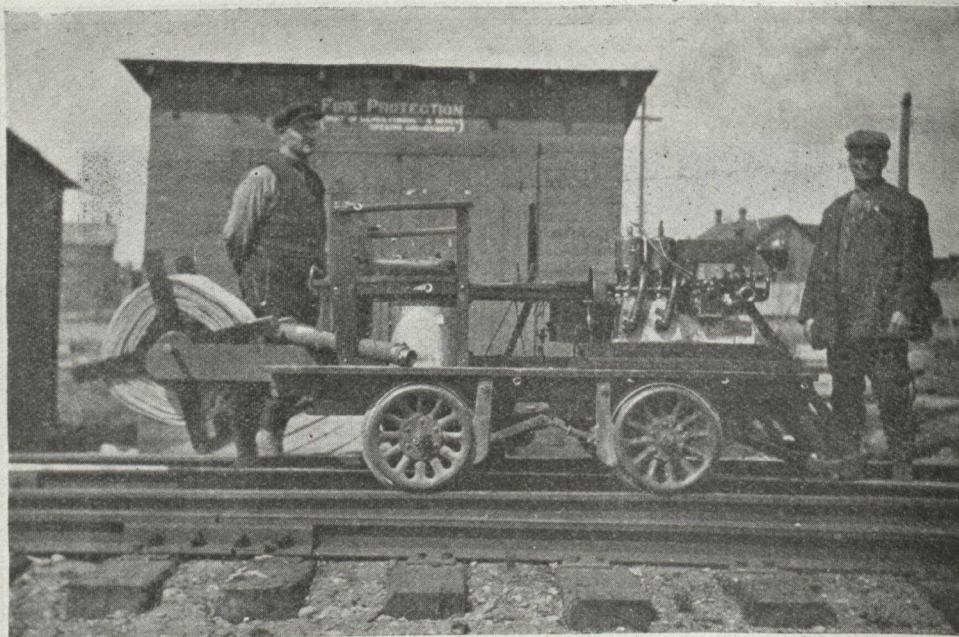
Plucking a handful of young sal leaves the forester wiped the cold sweat from his brow, and turned to leave the clearing. He immediately found himself gazing into the blazing eyes of a man-eating tiger! The position was critical, and the forester again deeply deplored the absence of a climbable tree. The tiger's tail, like the sambar's, was in evidence. But the tiger's afterthought wasn't perpendicular. It was vigorously swished from side to side and was playing the deuce with the young sals within its reach. The officer opened his coat, to get out pencil and paper wherewith to write a few last words, when—but let the forester tell his own story—"The tiger, I am of opinion, misunderstood my action. He thought, apparently, that I was about to give him a copy of the new forest orders dealing with the destruction of man-eaters, for, with a snarl of rage, he bounded off into the forest!" The intrepid man was saved! The story of the adventure concludes with these moving words, "I reached my camp and took out a bottle of Scotch. I do not mind confessing that my hand shook as I poured myself out a first-mate's nip."

SEN. CURRY'S TREES ESCAPE

The "new forest", consisting of 30,000 Norway pine seedlings, planted by Senator Curry some years ago at Athol, Nova Scotia, escaped all injury from the forest fires that have just swept that section of the country.



Returned Soldiers at Kapuskasing, Soldier Colony, Clearing their Lots in Preparation for Farming.



A Speeder that Means Business. Fire Superintendent E. G. Poole, of Cochrane, Ont., has Equipped one of his Motor Speeders with a Fender, an Electric Headlight, a Fairbanks-Morse Power Pump, and has Allowed Plenty of Room for Fire-fighting Tools. Note the Convenient Arrangement of the Hese Reel at the Rear.

Court Makes Settler Pay for Fire Damage

Quebec, June 18.—A case that interests every farmer and lumberman in the country, was closed here in the Appeal Court, when a decision of the Superior Court, condemning a homesteader to pay all damages arising out of a forest fire he caused. The case was that of Louis Collard, Joseph Villeneuve and the Factories Insurance Company against Elie Gagne. In the Superior Court Gagne had been condemned to pay Collard \$5,879.28 with interests and costs; to Villeneuve, the sum of \$834.60, and to the Factories Insurance Company \$1,600. These sums were claimed from Gagne because he was the cause of the forest fires that destroyed property belonging to the plaintiffs, the Factories Insurance Company also filing a claim for reimbursement on insurance paid.

The Superior Court condemned Gagne to pay all damages, and this decision has been maintained by the Appeal Court.

CATCHING TREE THIEVES "RED HANDED"

A reader of the Canadian Forestry Journal sends the following note regarding precautions adopted by the Chinese Government against theft of newly planted trees.

"So scarce is wood fuel in certain districts, due to China's indifference to forest protection in times past, that citizens are encouraged to plant trees by a drastic law making death the penalty for theft of saplings. I have planted many saplings myself but never without daubing them from roots to topmost twig with a red powder obtainable at any Chinese store. The object of this is that any robber touching the plant is easily traced by his red hands. The powder marks are not easily removed and form sufficient evidence to justify execution."

Riddance of Patronage a Great Gain

Dominion Forest Service now Appoints Field Staff on Merit Basis—Benefits to Soldiers.

The bringing of appointments to the outside service of the Dominion under the jurisdiction of the Civil-Service Commission under the amendments to the Civil Service Act passed at the last session of Parliament has been of great advantage already and its good effects have been felt in the forest service as well as elsewhere. The fact that the appointments of forest and fire rangers, permanent and temporary, are made through the Commission, which laid down the qualifications that would be required, placed the whole situation on a different basis and forestalled the efforts of men without qualifications and their friends to get them appointed. It also impressed on those who made a business of activity in interfering with appointments that their occupation was gone and their influence which was frequently exerted to upset discipline and efficiency in the service, has practically disappeared. Thus even the announcement of the definite adoption of the principle of Civil Service Reform has had a wholesome effect and has materially improved the spirit of the service.

Unfit Rejected

The definite results of the adoption of the Civil Service system has been that in appointments of temporary rangers or the filling of permanent positions that had become vacant only men who could show definite qualifications for the positions were considered and the appointment of the absolutely unfit or inexperienced was made impossible. In consequence, ineffective rangers have been largely eliminated from the temporary staff. The supervising officers of the forest service for the districts concerned were consulted by the Commission so as to get the benefit of their experience and local knowledge

of the men and the conditions under which they were to work and full weight was given to this evidence in determining the selection of the candidates. The knowledge that their judgment was to be given weight in the selection of the staff they were to supervise has given the supervising officers a greater interest and a better spirit in their work. The feeling of cooperation between the rangers and supervising officers has been greatly strengthened as they now are more thoroughly in sympathy in their interest in their work and their desire for efficiency.

Course for Soldiers

One important result of the adoption of the Civil Service system and an indication of how results follow one another is the establishment of a forest ranger course for returned soldiers at Vancouver in cooperation with the Military Hospitals Commission. Consideration of the establishment of a course of training for forest rangers was no new thing but action had always been hindered by the fact that even if men qualified themselves for positions as rangers, the existing system of appointment gave no guarantee that the man who spent his time and money qualifying himself would get an appointment even if there was a vacancy. Now, however, with the changed conditions, the establishment of such a course was a logical step and as the desire was to help returned soldiers first of all the Military Hospitals Commission was approached by the officials of the Forest Service on the subject, and in cooperation a course was laid out.

The lectures were given by officers of the Dominion forest service and by other foresters and a good number of returned soldiers who were found to be physically fit and took the course

successfully are now working as forest rangers and are making a success of the work.

Thus even in the first stages of its operation the Civil Service system has

helped materially the spirit and the personnel of the forest service staff and promises to add permanently to its efficiency and its spirit of public service.

Britain's Air Fleet Awaits Labor Supply

Referring to the statement of Mr. Joynson-Hicks, chairman of the British Parliamentary Air Committee, that England was preparing to launch into a tremendous campaign of airship building and fighting, the Imperial Munitions Board at Ottawa stated that Canada's organization for the production of airplane timber was complete except in one particular.

"The production of airplanes depends as much upon the supply of suitable timber as upon any other one thing," said an official of the board. "The best timber so far discovered for airplane construction is Sitka spruce, which grows exclusively on the Pacific Coast, and there only in favored localities. Washington and Oregon States have a fair area of this timber, but Queen Charlotte Island and the bays and inlets of the Mainland and Vancouver Island on the British Columbia Coast have the greatest area in the world, the trees in some districts averaging eight feet in diameter.

"Italy and France are securing their supplies in the United States while England also is buying part of her needs there.

"It is stated that 70,000 men are engaged in the woods and mills of Oregon and Washington. In British Columbia, however, the supply of labor is very limited, and only 3,200 men are now employed, though thousands more could be used.

"There is practically no limit to the necessities of England and the Allies for airplane lumber. While the actual footage required for an airplane is not great, in order to secure the quantity of the proper specifications from ten to fifteen times as much lumber must be cut. This will give

some idea of the labor involved. Yet to win victory, Mr. Joynson-Hicks says thousands of airplanes will be needed.

"The Imperial Munitions Board has a fine organization for cutting shipping and handling the logs and timber, and although our output is now four times what it was last January, we could enormously increase our production at present had we the increased labor necessary fully to operate the logging camps and saw-mills."

JOIN THE WOODLANDS SECTION!

A general meeting of the Woodlands Section of the Canadian Pulp and Paper Association will be held at Montreal in September. Papers will be given on these subjects: "Scaling"; "Driving Streams"; and "Company Camps."

Membership in the Woodlands Section is open to lumber firms as well as paper firms who are interested in the production of wood. The benefits accruing from personal association with the Woodlands Section are so obvious that no company eligible to nominate a member should lose the opportunity. A. L. Dawe, Secretary Canadian Pulp and Paper Association, Shaughnessy Building, Montreal, is the official to be communicated with in this matter.

The Forestry Journal will be sent to any address in Canada for One Dollar a Year.

Substantial Forest Losses in West

Word received by the Forestry Journal on July 19 from British Columbia states that the forest fire peril is the worst since 1910 and that rain at the date of writing was very badly needed. Experienced fire fighters were scarce and those directing the operations were working practically without sleep for days at a time. On July 11th, rain was falling generally in the coast districts, where the property loss is estimated at \$250,000.

On Vancouver Island bad fires occurred at Campbell's Bay, Chemainus, and Courtenay. At Grief Point, Bloedel, Welch and Stewart suffered a \$50,000 loss. The latter proved one of the hardest fires to combat, as two large fires simultaneously worked their way from Grief Point northward and from Powell River southward. It was feared for a time that they would meet with the resultant loss of valuable logging locomotives.

The forest fire peril which created regrettably heavy losses in Nova Scotia and New Brunswick last month has caused great anxiety in British Columbia and Alberta. While official reports are not yet available for the Forestry Journal, newspaper despatches from Vancouver claim that on July 2nd thirty forest fires were then in progress, although the British Columbia Forest Service announced officially that none of the fires was of serious extent. At the same time a public warning was given that the fire hazard was to be regarded as greater than last year when several disastrous losses occurred. Permits for burning slash had been cancelled at the end of June until weather conditions materially improved. Rain was sorely needed.

The telegraphic despatches from Calgary dated June 27th asserted that dozens of forest fires were raging in British Columbia and Alberta, and that damage to the eastern slope of the water shed was anticipated. Fifteen

fires were raging on Rest Creek, eight fires at Vernon and a large fire at Chemainus.

A despatch from Vancouver dated July 5th stated that No. 4 camp, International Lumber Company at Campbell River was burned out by forest fires and five logging engines were abandoned by their crews. If these engines prove to be a total loss, that item alone will run to \$70,000.

The "Pacific Lumberman" of Vancouver states that 3,000,000 feet of standing cedar in the Squamish Valley were totally consumed, as well as about 300 cords of shingle bolts.

The Provincial Forest Service has increased its fleet of motor cars which were found of great use in fire fighting last year.

Ontario and Quebec have enjoyed noteworthy freedom from serious forest fire trouble thus far. Quite a number of small fires have been reported in both provinces, Ontario registering 244. Of this number 175 were attributed to the railways. Permits to burn slash, etc., up to May 31st numbered 2213 of which 10,364 acres in 106 townships were burned over. The Railway Board inspection reports show that 454 locomotives within the Ontario boundary were inspected and 218 were found to be defective in their fire prevention appliances.

Districts Reduced

The Ontario department this year made several changes in the handling of the work to have closer inspection of the territory covered. In five cases the territory has been consolidated, while there were two subdivisions made, making the districts number 31 instead of 34 as last year.

The number of assistant chiefs have been increased to 41, which gives one assistant fire ranger supervision over twelve rangers. The rangers make daily reports of the weather, wind velocity, fires if any, and any strangers they meet on their patrol, and these are sent monthly

to headquarters. Owing to the earlier season this year a complete staff was put on at once.

Equipment Purchased

For the purpose of coping with any fires that might break out in the bush country, the department has purchased this year 65 canoes, 100 tents, 5 portable fire pumps, 5 boats placed on Georgian Bay, Lake Wahnapitae, Lake Nipissing, Metagami River and Lake Abitibi; 5 motor trucks stationed at Matheson, Englehart, Gowganda, Port Arthur and Dryden. These can be quickly run to the different points of danger, and in this way probably prevent anything like the disaster of three years ago.

The department has also built five chief rangers' headquarters, fourteen rangers' cabins, seven lookout towers, six docks, one railway motor car house, one boat house, 187 miles of new trail, new portages, eight miles of telephone line, and there were 45 acres of special fire hazard burned and cleaned by the rangers.

Additional information reaching the Forestry Journal from Nova Scotia shows the great need for intensive educational work along the lines of forest fire prevention. Many of the disastrous fires sweeping through parts of Nova Scotia in June were directly attributable to careless fishermen. Stories have come to hand of numbers of farmers and villagers who have lost their entire property, many of them uninsured, through preventable forest fires in the neighborhood.

Were Precautions Taken?

A timely word on Nova Scotia's losses is spoken by the Lunenburg Enterprise, as follows:

"There is scarcely any conception of the amount of property or its worth in cold cash that has been destroyed not only in Nova Scotia but in Lunenburg County during the past couple of weeks, by reason of carelessness in regard to bush fires.

They start from nobody knows where, but there is one thing evident that they synchronize with

the sportsman's visit to the woods and streams for a day of sport. A cigarette, a careless match, some dry grass or tinder for it to fall in, and there you have the whole equipment for a destroying, devastating forest fire. The same thing goes on from year to year, and all the preaching of public men and public bodies seems to have but little effect.

People deplore the high cost of living and assessment and the enormous amount of money it takes to keep things going, and then, thousands of dollars are wasted, just plain wasted. Their expenditure does nobody any good. It is a shame and it is pertinent to ask whether every precaution is taken by those in charge of the woods to prevent this annual waste or to discover those responsible for it. All will agree that the instances are rare when anyone has ever been called to account."

According to the Bridgetown, N.S. Monitor, the forest fires in Hants County have driven the wild animals out of their retreats. Bears and a large number of deer have been encountered on the railroad tracks.

PERIL IN EDMONTON DISTRICT

"There is considerable fire danger in some parts of the Edmonton district," states E. H. Finlayson, District Inspector of Forest Reserves at Calgary, according to an interview in the Edmonton Journal. "A year's total of fires is usually from 150 to 250, or more, and while most of these are confined to areas of less than ten acres each, the sum total of ground covered runs into as much as 40,000 acres. The causes of a large proportion of the fires are never known, but many of them are traced directly to settlers and campers."

Some way of utilizing the fire-killed timber on wooded lands that have been swept by these conflagrations is one of the matters to which Inspector Finlayson has given attention. "Only an insignificant proportion of this timber can be used for sawing purposes" he says, "but it is of considerable value in connection with the coal mining industry." There are billions of feet of fire-killed timber on the Alberta

slopes of the Rocky mountains, and even if all the mines in the province drew their supplies of mining timbers from this source it would not be possible to use more than a small percentage of the total. "Assuming that the next seven or eight years will see an increase of 100 per cent. in coal

production," says Mr. Finlayson, "something like a half-billion feet of board measure will suffice for coal mining operations until 1925. The question of a market for the bulk of Alberta's dead timber therefore still remains for future consideration."



Results of a Severe Forest Fire in 1906 on Head of Dungarvon River, New Brunswick. Timber and Much of the Soil Destroyed. The only Reproduction Yet Starting is Soft Maple. —Photo by G. H. Prince.

Public Pay the Cost of Forest Fires

Henry S. Graves, chief forester of the United States told the Federal Trade Commission that present cutting methods are crude and wasteful, but that fires were the greatest factor of loss so far. As systematic fire control is now operating, fires have been reduced to a minimum. The cost of this should be borne by Government and private owners.

Mr. Graves said: "If when we started using wood in paper making, fire control and scientific reforestation had prevailed, we would now have spruce enough in this country to meet our present needs without going to Canada for our supply, and newsprint paper would be cheaper. But as you must wait so long to realize the benefits of this plan, there is lacking the incentive for private owners. It is the public that is responsible for the present conditions, and it must pay the cost."

PELEE, A NATIONAL PARK

Point Pelee, the most southerly portion of Canadian territory, jutting out from the lake shore of Essex county, Ontario, into lake Erie for a distance of about nine miles, has just been created a National Park by the Dominion Government, to whom the land belonged. The creation of this park for the protection of its distinct and attractive tree and plant life and the wild life it harbours permanently and during certain seasons, was recommended by the Commission of Conservation and the Advisory Board on Wild Life Protection; the Canadian Society for the Protection of Birds and the Essex County Wild Life Conservation Association also advocated its creation.

The Forestry Journal will be sent to any address in Canada for One Dollar a Year. . . .

HOW RESEARCH PAYS

The great laboratory of the General Electric Company at Schenectady is maintained at an annual cost of over \$500,000 and employs seventy-five investigators, including among them several who are eminent in the world of pure science. One of its products is the tungsten lamp which is now manufactured by twenty-two factories scattered over the country. This lamp, according to a very careful estimate made in 1911, was, at that time, effecting a power saving valued at \$240,000,000 per annum. Since then, the consumption of this type of lamp has increased three-fold and further research has increased its efficiency of light production nearly 25 per cent. The research workers are discouraged from thinking of financial results, as discoveries are more likely to be made by those who are working in the scientific spirit.—*Prof. J. C. Fields.*

FORESTER BUYING SPRUCE

Mr. Ellwood Wilson, chief forester of the Laurentide Company is now a member of the Imperial Munitions Board and has been assigned the task of buying aeroplane spruce.

FORESTER REPATRIATED

Lieutenant J. R. Martin, among the Canadian prisoners in Germany to be repatriated and sent home, was formerly district forester at Nelson, B.C. He was wounded four times before being captured and spent 22 months in enemy territory.

FOR RETURNED SOLDIERS

A recommendation has been made by the New Westminster Board of Trade that in the framing of a permanent policy to assist the returned soldier to return to civil life, among the courses to be given at the B. C. University, forestry should be included.

The Origin of the Christmas Tree

From "Literary Digest."

The history of the Christmas-tree is difficult to trace. It has been connected with Ygdrasil, the great tree of Norse mythology, and Christmas-trees and May-poles are known to be relics of that famous Scandinavian Ash. The roots and branches of Ygdrasil, the world-tree, or as it is sometimes called, the Tree of Time, bound together heaven, the earth, and hell. From it all tribes of nature received nourishment. According to a Scandinavian legend of great antiquity the Christmas-tree owes its origin to the service-tree which sprang from soil that had been drenched with the blood of two lovers who had been foully murdered. During the Christmas season flaming lights that no wind could extinguish sprang mysteriously from its branches at night, and the practise of illuminating the Christmas-tree may, perhaps, be traced to this tradition, which no doubt was strongly influenced by the fact that lights were (and still are) a feature of the Jewish feast of the Chanuca or Lights (December 10). Among the Greeks Christmas is called the Feast of Lights.

From the earliest times Scandinavia was inhabited by two distinct peoples—the *Svea* (or Swedes) in the north, and the *Gota* (or Goths), in the south. They spoke similar languages and were of the same stock. In the fourth century the territory occupied by the Goths extended from the Baltic to the Black Sea, but this vast state was broken up by the Huns whose hordes then overran Europe. To the dispersion of the Goths may be attributed the spread of Scandinavian customs over the continent and the fact that the Christmas-tree is sometimes said to have originated with the Germans.

Sir George Birdwood has traced the history of the Christmas-tree to the ancient Egyptian practice of decking houses at the time of the winter

solstice with branches of the date-palm, the symbol of life triumphant over death, and therefore of perennial life in the renewal of each bounteous year.

LUMBERMEN UPHOLD LABORATORIES

A few weeks ago the American Lumberman offered the suggestion that the lumber industry should recognize and appreciate the value to it and to the people of the Forest Products Laboratory, and should urge upon Congress the necessity for more liberal appropriations for its support in order that it might attain to the full measure of usefulness. It is gratifying to note that the lumber industry has taken cognizance of this suggestion and through resolutions adopted at the annual meeting of the National Lumber Manufacturers' Association in Chicago this week has requested the national legislature to provide more liberally for this branch of the United States Forest Service that is doing such an important work for the Government and for the industry.

PAPER FROM SAWDUST

A portion of the edition of The London (Eng.) "Times" is printed on paper whereof sawdust is the principal constituent. The Times says: "Sawdust is a by-product produced in Britain. It takes the place of wood pulp, the importation of which is now greatly reduced owing to Government restriction. This paper is manufactured by the Donside Paper Mills, Aberdeen, where experiments have been in progress for a considerable time and are still being carried on in the hope of effecting further improvements."

Why Forest Reserves are Created

BY H. C. WALLIN, CHIEF OF SURVEYS, DOMINION FORESTRY BRANCH.

Dominion Government Desires to Protect Settlers from Poor Soils and to Maintain Timber Supply.

The objects of the reconnaissance surveys undertaken by the Dominion Forestry Branch are to procure information in regard to the value of the lands examined in relation to agriculture and as sources of water or timber supply, and to determine the advisability of recommending them for inclusion in Forest Reserve.

The prairie lands becoming settled, landseekers are now turning to the wooded districts for their homesteads. A glance at the Dominion Homestead maps will show us how every year settlement advances a little further north.

River bottom lands and lands surrounding lakes and along railroads are first taken up but gradually the settlements extend, the farms becoming more and more scattered as we get farther away from the main settlement. Experience has taught us that while generally the original settlements are well chosen, many of the homesteads surrounding them are or should be a cause of constant worry to their owners. Up in the northern country the climatic topographic and soil conditions are not as a rule favourable to agriculture. Pockets or belts of agricultural land are, of course, found but the greater part is unsuitable for farming. Many of the immigrants taking up homesteads in Canada are not farmers, many are city-born and bred and having no experience and no knowledge of soil conditions, etc., they are often induced to take up a piece of land that is not capable of supporting them in decency.

The result is that they either abandon the land after a few years or else stay there trying to eke out a bare living by doing odd jobs on the

outside. The man may be of a certain value to the community as a laborer but the 160 acres he has homesteaded are not doing their share in the development of Canada. They are idle or, if they are being tilled, they are tilled to no purpose. Instead of increasing, the land is decreasing in value on account of the timber or young growth, which usually is taken off the homestead by useless clearing or by fires started accidentally or intentionally.

To Save the Homesteader.

The prevention of homesteading on non-agricultural lands is one important reason why the Forestry Branch is anxious to have the country examined with a view to classifying the lands with regard to their suitability for farming or for forestry purposes. But it is, of course, not only the increased prosperity of agricultural Canada that we have in view in recommending the withdrawal of lands from settlement or in establishing Forest Reserves as proposed by our reconnaissance officers. The protection of merchantable timber and young growth and as a direct consequence thereof, the maintenance of a stable water flow in the watercourse is perhaps of even more interest to the forester. Thus we have another object in reconnaissance work; namely the location and ultimate reservation of valuable stands of timber or reproduction. By including these in Forest Reserves and thus placing them under the jurisdiction of the Forestry Branch we are able to afford the forest cover a better protection from fire and wasteful logging. Moreover, the timber sales will be based on rational methods.



Along the Kapuskasing River, Northern Ontario.

In addition to the determination of boundaries of Forest Reserves, the reconnaissance surveys help us to gain a knowledge of the character, extent and material value of the forest growth in the country examined. We obtain maps which show us the topography of the country and the location and relation of site and cover types; we are furnished with reports which in addition to matter relating to soil, forest growth and proposed reserve boundaries, give us valuable information in regard to logging, fire protection, game and other matters which bring themselves to the forester's attention during the course of the working season.

Prairie Sand Lands

To prevent homesteading on non-agricultural lands, the Branch has generally endeavoured to undertake the reconnaissance in advance of settlement. This has, however, not always been possible, especially in regard to the sandy areas in southern Saskatchewan where unfortunately numerous homesteads have been granted, which on examination were found to be absolutely unfit for permanent agriculture.

The principal object of the reconnaissance survey is accordingly to

classify the land in regard to its relative value as agricultural land or forest land and to locate the boundaries of any area which on account of its character is deemed advisable to recommend for inclusion in a Forest Reserve.

Two Classes of Reserves

The Forest Reserves of the Dominion are of two kinds:-

1. Forest Reserves in well populated districts.
2. Forest Reserves in rugged and mountainous country or in the practically unsettled and largely unsurveyed country north of the prairies.

Forest Reserves in populated districts generally consist of sandy, more or less timbered and as a rule hilly country surrounded on all sides by settled agricultural land. Such reserves are for instance the Moose Mountain, the Elbow, the Cypress Hills, and other Forest Reserves in the southern portions of the prairie provinces.

A survey of such an area must naturally involve a very careful examination of the soil conditions especially in the transition area between the interior non-agricultural and the surrounding agricultural lands. For that reason it is necessary that

the officer, to whom the work of examining proposed Forest Reserves of this character has been entrusted, has more than the ordinary knowledge of soils. Every quarter-section must be carefully examined and a correct classification of the land by climate, topography, and soil into agricultural and non-agricultural land made. Lands that are positively adapted for continuous production of farm crops or are chiefly valuable for agriculture should be excluded, while lands that are undoubtedly non-agricultural or lands that possess minor agricultural possibilities but are more valuable for the growing of crops of timber should be included in the proposed reserve.

Providing Farm Needs

Areas unfit for farming in the settled portions of the central provinces are comparatively few, and it is of great importance that all available land of this class be devoted to the growing of timber, thus to relieve to a greater or less degree the need of firewood, fence posts, and small building timber, which always is felt in the treeless prairies.

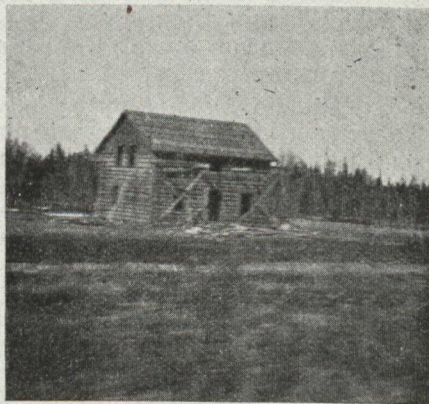
Proposed forest reserves in unsettled districts do not require such a careful examination. The reconnaissance in this case is more in the nature of an exploration in contrast to the survey of the proposed reserves in the old settlements which really takes the form of a more or less intensive soil survey. Here large areas of unsettled and largely or entirely unsurveyed lands are involved and anything but a rapid reconnaissance is at the present time impracticable and out of the question. This does not mean, however, that care should not be exercised by the forester in determining proposed reserve boundaries. On the contrary the future possibilities of the land should be considered and the inclusion of agricultural land should, wherever it appears in appreciable quantities, be avoided unless its temporary reservation is considered advisable until such time as the present crop of timber thereon has been removed.

Isolated small areas of good farmland in the interior of the proposed reserve which cannot be eliminated from the proposed reserve by any readjustment of boundaries may, however, very well be included until a soil survey of the reserve can be made.

A survey of this kind is, of course, only preliminary. Its principal object is to have defined by settled lines and placed under the jurisdiction of the Forestry Branch a tract of lands which is (in the main) non-agricultural and is or will become, if properly protected, of considerable value as forest land.

Cultivate Public Opinion

The officers in charge of a reconnaissance party should always make it a point to acquaint himself with the views held by settlers that live in the vicinity of the proposed reservation, in regard to the establishment of a Forest Reserve. He should explain to the farmers that the creation of a Forest Reserve means protection of timber, grazing, and water supply for the use of the farmer himself. The idea is here and there prevailing that a Forest Reserve is created to prevent the "poor man" from getting his supply of firewood and building timber. This opinion, which of course tends to make the Forest Reserves unpopular, should be discouraged.



Excellent Type of Farm House being Built by the Ontario Government for Accommodation of Soldier-Settlers at Kapuskasing, Northern Ontario.

The Pejepscot Plantations

In an article in the New York *Paper Trade Journal* Julian Rothery points out that forests, vast as they are, are not unbounded, and that the amount of pulp-wood available in this country and Canada which will permit of manufacture of reasonably cheap paper is not bottomless. He gives some interesting facts about what one paper firm has done in the way of reforestation and how its nurseries are conducted. To quote Mr. Rothery:

"The Pejepscot Paper Company is one of the old established manufacturers, with mills on the lower Androscoggin River in Maine and extensive timber lands both in Maine and Canada. It was also among the foremost to embark on a far-sighted policy of conservation, and its New Brunswick holdings constitute the finest spruce forest the writer has ever seen and probably the finest in eastern

America. Due to careful methods of cutting, there is more timber upon the lands today than when operations were commenced many years ago. But it is the reforestation of the barren or open lands where conservation is the most direct and aggressive. The Pejepscot Paper Company established nurseries at several places in its woodland properties.

"Thousands of these young trees have been set out in the old pastures and clearings and are slowly filling up gaps in the woodland cover. The cost is not heavy; the returns, both direct and indirect, are sufficient to make it an object to continue the work each year until now, when the open areas of their large Canadian properties are nearly all restocked with valuable growing trees. They find planting is educational as well as practical, tending to promote care of the forest and impress upon observers the value of trees and forest cover."

Can Forest Revenues be Maintained?

The point is frequently raised in connection with Canadian forestry policies that our Provincial governments will soon be obliged to return to the forest a much larger percentage of forest revenues than is now turned over to maintenance of timber materials. Indeed, the argument is frequently put forward that the day is fast approaching when the Provincial Governments instead of extracting surpluses each year from the forest resources may be forced to turn over to their Forest Services every dollar of revenues so as to provide a supply of raw materials to support the forest industries.

West Australia recently launched a strong forestry movement and in "Jarrah" the official mouthpiece, asserts that the system of extracting revenues from forest exploitation,

with almost no provision for maintenance of timbercrops, must cease. West Australia has reduced its forest area to about 3,000,000 acres, out of a total area of 975,000 square miles, and only 12,000 acres have been reserved. The export of forest products in 1913 brought 1,183,000,000 pounds sterling and only 12,000 pounds were spent on the Department of Forests.

"What business in the world could stand a system of management which aimed at taking all the profits and putting nothing back to consolidate, and improve the business and assure its future. Here is the most permanent and certain of all the primary industries, one which, under proper management will be yielding its timber in increased, not diminished volume long after the last ounce of gold has been won from the earth,

treated as of no importance and allowed to starve for lack of a sound forest policy."

The Forest Policy of West Australia is given as follows:

1. Demarkation and permanent reservation of the prime timber country.

2. The regulation of the cutting of timber so that only that quantity is cut annually which can be replaced by the natural growth of the forest.

3. The improvement of all cut and semi-cut out areas with a view to assuring the regeneration of the best species for future cutting.

A Wood Fuel Scarcity in Ontario

If Peel County, Ontario, may be accepted as typical of other counties in that province, the outlook for wood fuel supply for the coming winter is hardly cheering. Notices have been sent out to the farmers and others by the Provincial Fuel Controller urging the laying in of a supply of anthracite coal and cordwood at the earliest possible moment. This appeal may have some effect on the cutting of wood fuel late next Fall but at present the farmer's sole attention is given to securing all the anthracite that his local dealer can import. At Brampton, for example, dealers have found the farmer so obliging in teaming the coal to his farm direct from the railway siding that the townspeople have yet to get their first "look-in" on a winter coal supply. Other towns and villages have had a similar experience. The farmer is rapidly picking up all the coal in sight, while those who lack any means of transport are waiting their first chance at anthracite fuel.

In Peel County, a good quantity of fuel wood was cut last winter for home use. It is stated that the amount available for sale to townspeople will be negligible. A few weeks ago, a farmer seventeen miles from Toronto purchased two car loads of cordwood at \$10.50 a cord f. o. b. and the net cost delivered in his own farm yard was \$12.50 a cord.

Any visitor to rural Ontario is aware of many communities where cord wood is going to waste in woodlots while the owners and neighbors are frantically reaching out for coal. Labor scarcity doubtless has much to do with the present situation. For

example, an Ontario farmer, owning an excellent lot of maple and elm, offered fifty per cent. of the wood to any man who would come in and do the cutting; he has not had a single response thus far.

\$65,000,000 FIRE BURDEN

Up to the present, the fire loss of the Dominion of Canada is 25 per cent. greater than for the corresponding period of last year. If this rate of destruction continues, the loss will exceed thirty-two million dollars in 1918, and, together with expenditures upon insurance and fire protection, will constitute a burden of over \$65,000,000. This means about \$10 out of the pocket of every man, woman and child in Canada, or almost \$40 for the average family.

WOODMEN AS RANGERS

The New Brunswick Government is advertising for experienced woodmen to act as forest rangers—one of the gratifying signs, points out The St. John Globe, of the new era of forest management in the Province. New Brunswick sets an example in principle which other Provinces would do well to follow in all departments of Government.

FOREST FIRES SAVED APPLES?

Says the Lunenburg, N. S. Record: "It is an ill wind that blows nobody good," was truly exemplified last week when the smoke from the forest fires settled, it is said, like a pall over the Annapolis Valley and saved the apple blossoms from frosts

Canada's Pulpwood Resources

The following table shows the approximate amounts of certain classes of pulpwood material now standing in the several provinces of Canada. All sizes of the species named are included; It represents, to some extent, a compromise between the guesses made by various individuals or organizations in the past, and information relating to the partial areas based upon investigations actually made in the field.

	Cords
Nova Scotia	30,000,000 spruce and balsam.
New Brunswick	33,000,000 spruce and balsam.
Quebec	300,000,000 spruce and balsam.
Ontario	200,000,000 spruce and balsam.
<hr/>	
Total for Eastern Canada	563,000,000 cords.
Prairie provinces ..	85,000,000 spruce and balsam.
Prairie provinces ..	100,000,000 poplar
British Columbia ..	285,370,000 Sitka spruce, western hemlock, balsam and cottonwood.
<hr/>	
Total for Western Canada	470,370,000 cords.
<hr/>	
Total for all Canada.....	1,033,370,000 cords

In considering this table certain allowances must be made in arriving at commercial possibilities. In the first place, vast amounts of materials of suitable size for pulpwood are so situated as to be commercially inaccessible. In other cases, bodies of timber of limited size are so scattered as to make profitable operation impracticable. Further, balsam does not float readily for long distances, and heavy losses result from sinking where long drives are necessary.

Another factor, sometimes overlooked, is the heavy demand upon these forests for purposes other than the cutting of pulpwood. The greatest of these is for the manufacture of lumber, for which very large amounts of spruce and balsam are used annually in eastern Canada.

KILLING FARM WOODLOTS

(*Kitchener "News Record"*)

In the past Waterloo county, like all other counties in older Ontario, has been prodigal in its cutting of trees in its woodlands. Were proof of this needed, the annual flood and batches of complaints from inundated municipalities along the Grand River furnish it.

There is presently a strong temptation offering all owners of bush land to cut down trees for firewood, owing to the scarcity of coal. This demand cannot be wholly ignored. Yet before the comparatively few remaining patches of woods are levelled, the best forestry practise should be followed.

Those who "kill the goose that lays the golden egg," are frequently quoted. Alongside of them should be placed those who have indiscriminately cleared their bushlands.

Had a wiser policy been pursued, they would have obtained greater money returns from their bushlands and still have them. Conservation and reforestation would have wrought this gain.

MR. POWER'S ANNIVERSARY

Mr. William Power, of Quebec, is celebrating the 60th anniversary of his connection with the well-known lumber firm of W. & J. Sharples, of which organization he has been President for many years. Mr. Power is a former President of the Canadian Forestry Association.

The Inroads of Timber Substitutes

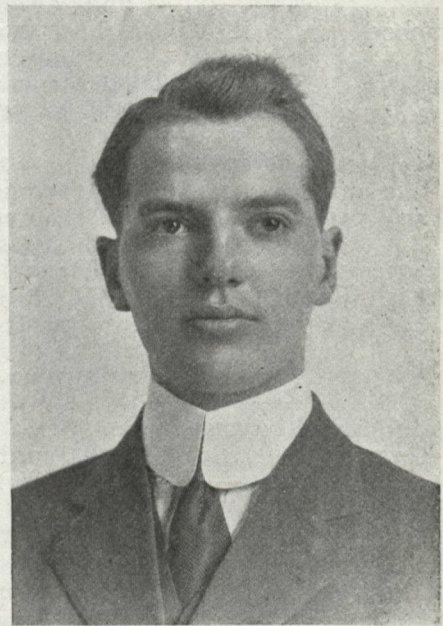
BY M. A. GRAINGER, CHIEF FORESTER OF BRITISH COLUMBIA.

"It is not merely a question of finding new markets for British Columbia lumber to be sold in. It is a question of protecting the markets we've already got. Where would the province be if any serious proportion of its existing lumber business were wiped out? It couldn't happen, you'll say. People have got to buy lumber. It's a staple article, like wheat. Well, they've been carrying on a searching investigation into the lumber trade of the United States, and this is what they've found as a result: Just one-fifth of the entire lumber market that existed eight years ago has been wiped out. Wiped out by substitutes: steel, concrete, bricks, patent roofing, asphalt paving; wiped out in some cases because the substitute was the better article, but in far too many cases simply because the makers of substitutes used modern selling methods and the lumbering industry did not.

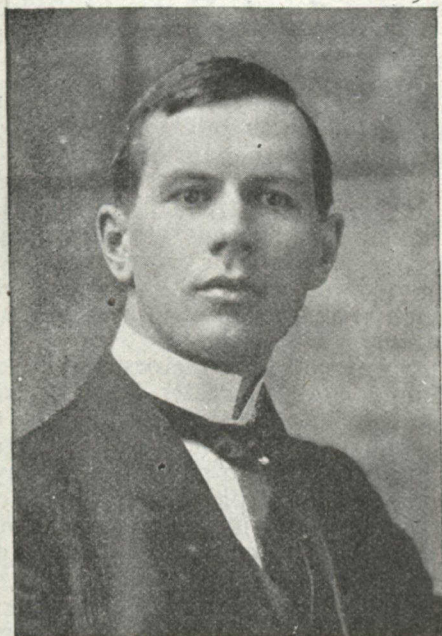
There is no better selling method than giving good service to the consumer, helping him to use your material and to get the best value out of it. That is the method adopted in this province. Many a sale of British Columbia lumber has been made to prairie farmers who have been supplied with building plans, and bills of material showing them how easily and well they can build barns or sheds or chicken houses with British Columbia lumber. And, just as we have done in this case, we hope to cooperate with our lumbermen and get all the best selling methods carried out in this community effort to increase the sale of British Columbian lumber. In short, persistent market work is one of the most practical methods of forest conservation there is.

Our American friends are engineering some progressive ideas. For instance, in the interest of forestry they've allowed the export mills of the Pacific coast to form a selling

combine, the Sherman law notwithstanding, and they are sending five lumber commissioners to strengthen their grip upon European and other markets. It is interesting to note that these five have been selected from candidates who have been put first through a series of severe practical examinations—a new idea in foreign commercial service, and a great change from the time honored method of giving foreign commercial jobs to good Americans with a pull."



A. H. Beaubien, B.A., Ottawa, working under the auspices of the Canadian Forestry Association, spent three weeks in holding public meetings in Western and Northern Quebec, in the territory of the Ottawa River Forest Protective Association. Mr. Beaubien met with remarkable good fortune and was greeted by large audiences. All lectures were illustrated by stereopticon.



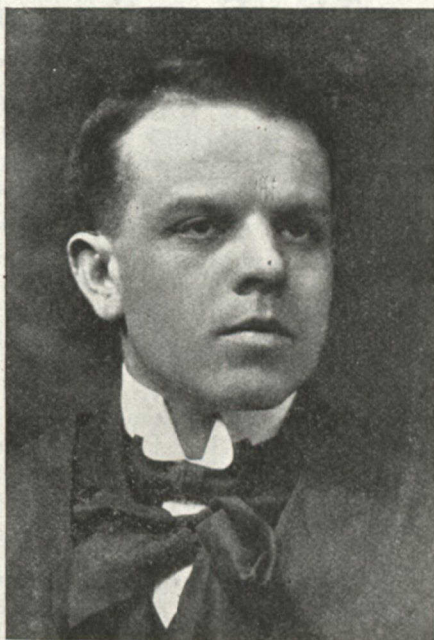
J. André Doucet, B.A., B. Sc. F. Forestry Branch, who by courtesy of the Director of Forestry and acting under the auspices of the Canadian Forestry Association, held twenty well-attended public meetings in Northern New Brunswick. The lectures were illustrated by stereopticon. The message of forest protection and forest maintenance was brought forcefully to the attention of thousands of French-speaking citizens.

A PROPHECY OF 1656

An interesting prophecy of Great Britain's drastic experiences in procuring timber supply from her own lands is contained in "the Gentleman Farmer," by Henry Home, Lord Kames, published in Edinburgh in 1776.

"Considering the great quantity of waste land in Scotland, fit for only bearing trees, and the easiness of transporting them by navigable arms of the sea, one cannot but regret the indolence of our forefathers who neglected that profitable branch of commerce, and left to us the necessity of purchasing foreign timber for every use in life."

Gabriel Plattes, in his "Practical



Victor Baillaigé, B.A., a graduate of Laval Forest School, and employed in the Quebec Forest Service, undertook a busy itinerary of five weeks in the territory of the Laurentian Forest protective Association, from the St. Lawrence through the Lake St. John region and down the Saguenay. Mr. Baillaigé appeared under the joint auspices of the Quebec Department of Lands and Forests, the Canadian Forestry Association and the Laurentian F. P. Association. His tour was attended by a lively public interest, and large audiences were met at most points.

Mr. Gustave C. Tessier, whose portrait is not available for this issue, undertook similar work in the territory of the St. Maurice Forest Protective Association, and met with first-rate success.

Husbandry," published in 1656, says: "Now the multitude of Timber brought yearly from *Norway* and other parts does plainly demonstrate the scarcity thereof here: also it may be conjectured what a miserable case the Kingdom will be plunged into in an Age or two hence, for want of Timber."

The Function of Watershed Forests

The effect of the forests upon Canadian streams does not require scientific data to prove its reality. Every observer who has compared the flow and uniformity of streams under contrasting conditions of forest growth on the watersheds knows that tree life is a conserver of surplus moisture and a mighty aid in the regulation of the Spring run off.

In this connection it will be interesting to many readers to note the conclusions of Mr. Raphael Zon, Chief of Sylvics, U. S. Forest Service, Washington, after a very thorough examination of available evidence in the United States and foreign lands.

"The available observations upon the behavior of streams in this country and abroad have established the following facts:

1. The total discharge of large rivers depends upon climate, precipitation, and evaporation. The observed fluctuation in the total amount of water carried by rivers during a long period of years depends upon climatic cycles of wet and dry years.

2. The regularity of flow of rivers and streams throughout the year depends upon the storage capacity of the watershed, which feeds the stored water to the streams during the summer through underground seepage and by springs. In winter the rivers are fed directly by precipitation, which reaches them chiefly as surface run-off.

3. Among the factors, such as climate and character of the soil, which affect the storage capacity of a watershed, and therefore the regularity of streamflow, the forest plays an important part, especially on impermeable soils. The mean low stages as well as the moderately high stages in the rivers depend upon the extent of forest cover on the watersheds. The forest tends to equalize the flow throughout the year by making the low stages higher and the high stages lower.

4. Floods which are produced by exceptional meteorological conditions can not be prevented by forests, but without their mitigating influence, the floods are more severe and destructive.

Delusions Must Give Way to Facts

(Dominion Advisory Council on Industrial and Scientific Research.)

"It should be understood that there is only one way of keeping the forest resource inexhaustible, namely, by means of reproduction.

"We know next to nothing as to whether, and to what extent, the cut-over lands are reproducing the timber that has been removed, still less at what rate such new crop is growing.

"General principles of silviculture can be imported from Europe and, in so far as the same species occur in Canada that are found in the United States, we can profit to some extent from the work of their foresters; finally, however, climatic and soil

differences make it necessary to learn how to manage the species under their home conditions. We have in Canada not yet undertaken the first systematic study of the biology of any of our species, a knowledge fundamental to its silviculture. This is to be accomplished by observation in the field and by a systematic location of permanent sample plots placed under different treatment and observed periodically.

"As regards increment, the rate of production that may be expected from our species under varying conditions, we are also lacking in knowledge. There are neither volume

tables as aids for timber estimating nor growth or yield tables as bases for calculating the results of our silviculture in existence. Meanwhile, truly foolish ideas prevail regarding the rate of growth of forest trees and forest acres. A correction of these ideas through systematic measurements will bring the wholesome reali-

zation that the replacement of our cut timber takes many more years than is generally believed. We may add that these investigations are most urgently needed for the species of the eastern provinces, which have already been largely exploited and where recuperative measures should be applied at once."

Keep the Woodlot for Future Needs

By "Ahmik" in *Toronto Globe*.

The importance of a well-thought-out system of forest conservation in connection with land settlement cannot be too strongly emphasized. We all realize now the evil effects of over-clearing of land in older Ontario. There has been over-clearing even of good agricultural land; some land wholly unfitted for agricultural production, that should have been left in permanent forest, has been stripped clear of timber. As a result, over a vast territory once rich in wood, people would be in danger of freezing to death were it not for imports of coal from the United States. Despite the lesson so taught there are considerable areas in New Ontario, north of New Liskeard, opened up only yesterday, in which the fuel problem is already almost as acute as it is in older Ontario. We should see that the folly shown in these two cases is not repeated in that vast territory stretching some 400 miles west of Cochrane, a beginning on the opening of which has been made by independent settlers, stringing out along the line of the Trans-continental, and continued by the returned-soldier farming colony, farther west along the same line. In practically every case, land occupied along this line has been completely cleared as far back from the railway as cutting has gone. No such avenues of trees as have been planted here and there along the roadsides in older Ontario have been left along the right-of-way or where the lanes will lead up to the houses.

There is no evidence of preparation for the leaving of wood lots as a permanent source of lumber and fuel supply for those making homes in that country. It should be part of the conditions of sale that in all cases a certain proportion of the land allotted settlers shall be reserved for permanent timber growth.

NEW PAPER-MAKING PROCESS

From Queensland come reports of successful experiments in manufacturing paper pulp out of "lalang" grass, which resembles very closely the "esparto" of Spain and North Africa, and which when dried before making it into pulp yields as high as sixty per cent. of first-class paper-making pulp. The expert states that esparto is the best pulp known, and the lalang grass product is within ten per cent. of the same value. There are millions of tons of this grass growing in Queensland. Three crops a year can be cut from it, and this plant is said to be otherwise a curse to the country. Chinese "barr"—Urena—and the Queensland hemp—*Sida Retusa*—are said to produce thirty per cent. of first-class paper pulp. *Lantana*, which is also regarded as a great pest, makes an excellent wrapping-paper.

Cellulose from seaweed and a paper milk bottle are the latest additions to the paper industry extension.

For Every Acre a Proper Crop

SIR RONALD MUNRO-FERGUSON, GOVERNOR-GENERAL OF AUSTRALIA.

"One of the considerations which I venture to submit is the need for the allocation of land for agriculture upon the one hand and silviculture on the other. I have seen in some States great destruction wrought by individual pioneers who did not always make a success of their undertakings, and I have seen abandoned holdings in the middle of destroyed forests—which, in their way, had been perfect of their kind. Whatever land is suitable for agriculture should be kept

for agriculture, and where it is suitable for forestry, and not for agriculture, then it should be kept for forestry. That can only be done by survey, and after the survey, then classification, and then will come the question of forest reserves and the establishment of areas suitable for forestry as permanent reserves, and the issue of regulations sufficient to insure and preserve the safety of these reserves."

New Settlers Must Take Out Permits in West

According to an important order-in-council passed by the Dominion Government on May 7, 1918, all persons taking up a homestead on Dominion lands in a wooded district (outlined in the order-in-council) or within six miles of a forest reserve or timber berth must take out a permit from a forest ranger before setting fire to clear land.

Manitoba and Saskatchewan Governments have already applied a similar provision to all settlers under provincial jurisdiction so that the Dominion order-in-council will blanket all settlers now on patented lands or who may take up lands in the future. Alberta has yet no law enforcing the permit plan on owners of homesteads; the Dominion measure will affect only those who may take up lands in future.

926 PAPERS SUSPENDED

In the investigation before the Federal Trade Commission in the United States the statement was made that in 1917 no fewer than 926 newspapers in the United States and Canada suspended publication while

250 others were eliminated by consolidation.

FORESTRY BOARD COMPLETE

Archibald Fraser, of Fredericton, has been appointed by the Minister of Lands and Mines, representative of the private timber land owners upon the Forest Commission which is to have charge of the crown lands of New Brunswick, under the legislation passed at the last session of the Legislature. The other members are: Hon. E. A. Smith, Lt. Col. T. G. Loggie, Deputy Minister of Lands and Mines; G. H. Prince, Chief Forester; D. J. Buckley, representative of the holders of timber licenses.

The Abitibi Power and Paper Co., of Iroquois Falls, Ont., is now turning out daily about 425 tons of paper and pulp all told but after the war when additional paper making machines are installed, the output of newsprint alone will be about four hundred and fifty tons, making the largest production under one roof of any paper company in the world.

Forest Legislation in Canada 1917-18

A Resume of Public Measures in the Provincial and Federal Fields.

In New Brunswick

The **FOREST SERVICE ACT** creates a Forest Service in the Department of Lands and Mines and empowers the Minister to appoint a technically trained Provincial Forester. The Forest Service is to administer all statutes and regulations *re* Forestry, Hunting, Fishing, Forest and Game Protection, have charge of the protection of the forests from fire, the construction and maintenance of all permanent improvements (roads, telephelines, etc., etc.) and reforestation.

A Forest Advisory Commission is also created to consist of the Minister of Lands and Mines (Chairman), the Deputy Minister of that department, the Provincial Forester, one lumberman to represent the licenses and another lumberman or forester to be named by the Minister, who must be "associated with the ownership or management of the Crown-granted forest lands." The functions of the Commission are to advise in regard to administration and to supervise all permanent appointments. All permanent appointments and, as far as possible, temporary appointments, are to be by examination conducted by an Examining Board, comprised of the Provincial Forester, and two others, all appointments to be approved by the Commission after a six months' probation. A Protection Fund, to amount to \$100,000 per year, is created, made up as follows:- (1) \$30,000 of the revenue collected under the Wild Land Tax, (2) half a cent. per acre on all timber areas under license (the Forest Protection Tax), (3) fines and fees under the Forest Fires Act and the Game Act, (4) balance to be provided from Consolidated Revenue Fund. Any balance at the end of the year is to be placed in a Protection Sinking

Fund, to be used in case of emergency. Permanent forest rangers are given all the powers of special constables.

N. B. Forest Fires Act.

The Forest Fires Act provides for a closed season (April 15 to October 15) to be lengthened if necessary, during which no one may set out a fire (except for cooking or warmth) within half a mile of any slashing or debris, fallen or standing timber or brush land, until he has obtained a permit from a forest officer. Precautions to be taken when starting a fire are stated. Penalty is provided for any person leaving a fire burning so as to endanger the property of another person, and for carelessness, in dropping lighted matches or pipe, cigar and cigarette ashes. No person may start a fire on any land not owned by him, except with the owner's consent. Any person neglecting to do his utmost to prevent a fire from spreading is made an offender under the Act and liable to all expenses incurred in extinguishing it. Forest officers are empowered to compel the services of all males between eighteen and fifty years for extinguishing a fire. The Minister is given power to destroy any material which constitutes a fire danger. Debris around camps, mines, saw-mills and engines must be cleared up, brush and debris resulting from clearing all rights of way must be burned and any accumulation of inflammable debris within 300 feet of the centre of a railway must be burned; if this is not done, the forest officers are given authority to destroy such debris at the expense of the person interested. Watchmen are required during the close season for stationary or portable engines in a forest. Every adult is required to report fires, when known.

Railway Safeguards.

During the close season all steam engines (locomotive or stationary) operating inside of, or up to a quarter of a mile from timber must have spark arresters and devices for preventing the escaping of fire or live coals from ash pans or fire-boxes, burners, chimneys and smoke-stacks must have spark arresters, and open waste-burners must be properly safeguarded. During the close season fire-fighting tools must be kept ready for use, and no locomotive or engine may dump fire or live coals unless these are immediately extinguished. Railways under provincial jurisdiction passing through forested land are specially provided for, and no existing statute regulating them is repealed or at all interfered with. Locomotive engines must have the most approved fire-protective apparatus, and every engineer must see that these appliances are properly used and applied. The right of way must be patrolled at least once a day and must be kept free from dead or dry grass or weeds and other combustible matter. Extra patrol may be ordered by the Minister when deemed necessary, and if his instructions are not carried out the patrol may be established at the expense of the company. Railway companies are made responsible for all fires within three hundred feet of their right of way, unless they can prove the fire not to have been caused by the Company or its employees. No railway company completing the construction of a line after the passage of the Act may operate locomotives on the line until the Minister has certified that the right of way has been cleared of inflammable material. The Minister may appoint fire rangers, under a Chief Ranger, to patrol railways under construction. Railway companies must put their employees at the disposal of the Chief Ranger to assist in extinguishing fire. Nothing in the act is to be held to limit the right of any person to bring civil suit for damages caused by fire.

Wild Lands Tax Act.

Provides for a tax on all wild lands

exceeding five hundred acres of one cent per acre when held by residents of the province and two cents per acre when held by non-residents. Part of the funds realized are to be paid over to the Protection Fund created by the Forest Act as above noted.

The Act prohibiting the export of pulpwood from Crown Lands was amended by adding to the "Manufacturing Clause" a statement to the effect that cutting such wood into cordwood or other lengths and "rossing" or peeling the bark, were not "manufacturing" within the meaning of the Act. Poplar wood is also restricted from being exported. Unmanufactured pulpwood grown on ungranted Crown lands may be exported to the United Kingdom until two months after the declaration of peace.

Dominion Lands

The Dominion Forest Reserves and Parks Act was amended to provide (1) that where existing road allowances are, for topographic reasons, found unsuitable, the Provincial government may be permitted, by Order in Council, to exchange these for suitable road allowances, and (2) that the government of British Columbia be given the right to the non-precious metals found within the Forest Reserves.

The Forest Reserve Regulations were amended in a number of particulars, the general tenor of the amendments being as follows:-(1) The regulations in regard to timber permits were changed so as to provide that the quantity of timber so granted should be limited, not by a specified quantity of timber of each class, but by a certain amount of dues, thus allowing greater latitude as to the respective quantities of the various classes of timber that can be taken out, (2) trespass is more clearly defined, (3) Regulations in regard to the use of fire are improved; (4) Regulations in regard to operation are improved in some points, (5) Regulations as to the granting of permits for the cutting of *dead* timber on the forest reserves are made more elastic so as to give every encourage-

ment to permittees to remove it, (6) the regulations in regard to grazing and hay are made more specific.

In Ontario

The Forest Fires Prevention Act was amended by providing for the appointment, at the request of the owner (i.e., the licensee of an area or any person having the right to cut timber on the land) of extra or special rangers to be paid by the owner as directed by the Minister of Lands, Forests and Mines.

New regulations for forest reserves were promulgated under the Forest Reserves Act. These forbid the disposal of land within the reserves for agricultural purposes altogether, and for prospecting and mining, hunting and fishing except under the regulations. Persons travelling through the reserves must give to any forest officer, when required, particulars as to themselves and their business in the reserve.

Mining Prospectors operating in reserves must have yearly permits. No lands valuable for the timber thereon may be disposed of for mining purposes and all timber cut on lands so leased must be cut under regulation of the Minister. Mining operations on reserves must have the permission of the Minister and no ores containing sulphur may be roasted in the open air in forest reserves. No tree may be cut, barked or otherwise injured except under written authority of the Minister. Precautions must be taken in setting fire and all fires kindled in the reserves must be extinguished before being left. Locomotives passing through the reserves must have spark-arresters or other efficient means of preventing sparks escaping. Making roads, erecting buildings and other improvement work may be done by the Minister, and no such work may be done without his written permission. A Superintendent and rangers may be employed for each reserve. All guides in the reserves must be licensed. No mining lease may issue for work in the reserve until all development work has been com-

pleted. The Game Act is by Order in Council made to apply to forest reserves.

In Quebec.

An order in Council of June 12, 1918, makes a number of increases in dues and rents to be paid by licensees in the province, for the years 1919-20 to 1923-24, with further increase for the years 1924-25 to 1928-29. By this Order in Council the ground rent is increased from five dollars per acre to six dollars and fifty cents for the years 1919-20 to 1923-24 and eight dollars for the years 1924-25 to 1928-29. In most of the specified classes of timber the increases run from thirty up to one hundred per cent; on miscellaneous timber the due is a straight fifteen per cent. The further increases dating 1924-28 will give a further increase on the 1918-19 to 1922-23 prices of twelve and a half to sixty per cent.

In Alberta.

The timber Areas Act was amended so as to provide that anyone owning, leasing or operating any timber area who fails to give the Minister of Municipal Affairs any information called for by the latter shall be liable to a fine up to \$50 and costs, or in default, to imprisonment not to exceed six months and giving the Minister power to assess the area after getting information from the Government of Canada or otherwise.

A number of amendments, chiefly as to matters of administration, were made to the British Columbia Forest Act.

Saskatchewan reduced the tax on timber areas or berths (payable by owner or operator) from one and a half cents to one cent per acre, areas held under permit exempted. Persons who manufacture lumber from trees cut on their own timber areas may be granted a rebate of all sums over and above half a cent per acre, paid or payable during 1913 and subsequently.

No change in forestry legislation is reported from Nova Scotia or Manitoba.

Quebec Raises Dues and Ground Rent

An increase in timber dues and ground rent has been ordered by the Quebec Department of Lands and Forests and will have an appreciable effect upon the wood-using industries, as well as adding substantially to provincial revenues.

The Minister in a memorandum dated June 12th, recommends the following modification of the Order-in-Council, April 26th, 1910:—1. That the annual ground rent per square mile or fraction of a square mile payable on the issue of licenses to cut timber be of six dollars and fifty cents for the years 1919-20 to 1923-24, both inclusive, and of eight dollars for the years 1924-25 to 1928-29, both inclusive, nevertheless, the rent of ground rent may, at any time, be increased for license-holders who do not operate on their limits, the Crown reserving the right to fix the quantity of timber to be cut to constitute sufficient lumbering operations; 2. That all wood cut in virtue of a license during the lumbering seasons 1918-19 to 1922-23, both inclusive, and 1923-24 to 1927-28, both inclusive, be subject to the following charge:

1. Square, waney or flat timber, per cubic foot:

(a) White pine, oak, hickory and walnut 0.08 0.10

(b) Red pine, elm, ash, cedar, basswood, birch, maple, tamarac 0.06 0.08

(c) Spruce, balsam, grey pine or banksian pine hemlock, white birch, aspen, poplar 0.04 0.06

11. Saw logs and boom and timber dimension in the raw state, per thousand feet, board measure:

(a) White pine, oak, hickory, walnut 2.60 3.00

(b) Red pine, elm, ash, basswood, birch, maple, tamarac 2.00 2.00

(c) Spruce, balsam, grey pine or banksian pine hemlock, white birch, aspen, poplar 1.60 1.80

(d) Cedar 1.40 1.40

111. Poles more than 18 feet in length, not exceeding 10 inches in diameter at the small end, each:

(a) 30 feet and less in length 0.25 0.40

(b) 30 feet and less in length 0.50 0.75

(c) 41 to 50 feet in length 1.00 1.50

(d) 51 feet and over in length 2.00 3.00

IV. Railway ties or sleepers not exceeding 9 feet in length, each 0.10 0.10

v. All other wood goods, ad valorem 15% 15%

PERPETUATION OF PULPWOOD

W. F. V. Atkinson, chief forester of the Spanish River Pulp and Paper Mills, Sault Ste. Marie, states that what C. D. Howe, Ph.D., in an article in the Pulp and Paper Magazine entitled "Forest Regeneration on Certain Cut-Over Lands in Quebec," says with regard to certain districts on the St. Maurice River in Quebec is subject of course to local conditions, generally applicable to parts of the Province of Ontario." It is absolutely essential to the perpetuation of Ontario's pulpwood areas that detailed studies be made and regulations worked out after these studies, if the pulp wood of the province is to be perpetuated for any length of time. The regulations will have to include, among other plans, that of the Crown securing the services of a large number of forest assistants of all grades, amongst the duties of whom will be that of marking only such trees as can be properly harvested. This entails a change in methods of such a radical character that it does not appear likely to be adopted for some time to come, or, at least until after the war."

Railway Roadmaster Sets Good Example

If all railway roadmasters would imitate H. B. Cassidy, in charge of the Canadian Northern line from Quebec to La Tuque and Chicoutimi, railway fires would be of less frequency. Following is a copy of instructions sent by Mr. Cassidy to all section foremen.

In case of fire I want you to assist the Fire Rangers when called upon.

According to an arrangement between this Company and the heads of the St. Maurice and Laurentian Forest Protective Associations in connection with the fire patrol and care of fire in every respect, you will arrange to co-operate with these people by all possible means, therefore should the fire ranger happen to call upon you for assistance, him do everything possible to give them what assistance you can and as QUICK AS YOU CAN, because by acting promptly, fires are often controlled before any material damage is done.

It has also been arranged with Fire Rangers in certain Districts to assist the Section Foremen in burning grass, old ties, etc., this with a view of showing sectionmen the proper methods of doing this work, and as you are aware many times when foremen undertake to burn the right of way, they do not always take all the necessary precautions to look after the fire and in many cases this involves a lot of extra work, due to carelessness in burning the right of way.

The object in co-operating with the men employed by the Associations named above, is to learn the best methods and obtain the best results, as well as eliminating a lot of trouble. Therefore, I trust you will give all necessary assistance when called upon and be governed by their instructions with regard to fires in the future. As these people are desirous of assisting us in our work we should also be anxious to assist them in carrying out their part."

COMMUNITY STUDIES

One of the economic studies made last year concerned the relation of forest utilization to community development in the Pacific North-west and northern Lake States. The lumber "camp" is the natural result of a nomadic lumber industry. As the forests of any region become permanent sources of timber supply they become capable of supporting a more stable population. Where the forest is the main resource the development of permanent industrial communities as sources of labor supply is obviously desirable. In regions where the land, though originally timbered, will be put to its best use through clearing for agriculture, it is desirable that forest utilization should contribute as largely as it may to the upbuilding of organized agricultural communities. To learn both the present actual conditions and the possibility of bringing about improved conditions the study was undertaken.—*From the report of H. S. Graves, Chief Forester of United States.*

CONQUEROR'S OAK FALLS

A correspondent of London, Eng., says Canadian Foresters have felled the famous tree which stood in front of Windsor Castle, known as William the Conqueror's oak. The tree was reputed to be a favorite of the Norman Duke, who protected it from deer. Old manuscripts show the oak tree existed in the year 900. Latterly the tree became unsightly and was very rotten. After ineffectual attempts to have it reinforced with cement, the King ordered its removal.

The timber is very fine grain and color. One slab is used for a mantle-piece in the small replica of a Canadian log cabin built by the Canadians in Windsor Park as a tearoom for the King. A number of souvenirs have been made of the wood. One is a carved plaque of Windsor Castle background and Indian's head.

Boy Scouts Search Out Black Walnut

Washington.—President Wilson's appeal to the Boy Scouts of America to help win the war by locating supplies of black walnut trees has been followed by arrangements under which the War Department, the Forest Service, and the Boy Scout organization have joined efforts to find the needed timber.

As President Wilson pointed out, the War Department program makes the securing of black walnut lumber for use in manufacturing airplane

propellers and gunstocks of the utmost importance. War Department and Forest Service officials are combing the country for black walnut timber, which can no longer be found in abundance anywhere but has to be culled, often as single trees, from mixed forest growths. Much of the black walnut that is left is in farmers' woodlots, and it is primarily to locate this that the Boy Scouts have been called into service. In the aggregate, there are said to be large supplies.

Settlement Problems After the War

The relation between the forests and settlement is a question involving many interests, and is one not easy of solution. The need for land for settlement after the war will make it necessary to devote every possible piece of land to agricultural purposes, but on the other hand the financial demands for the war will make it advisable and necessary to protect the public forest property, and

ensure that the forest on non-agricultural land is retained and brought into best producing condition. This is a question which cannot be decided from the point of view of either interest solely, and which shows the necessity of co-operation between the agricultural and forestry interests for the development of an agricultural and forest survey of the country such as will determine the best general lines of development for each district.



A Government Roadway in Northern Ontario in Process of Construction.

WEEDS KILLED BY PAPER

H. E. Howe, who conducts the chemical service department of *The Scientific American*, tells us in that paper that in the tropical countries where sugar-cane flourishes, weeds spring up overnight in numbers and strength that will choke off any crop with ease. The expense of keeping them down is by no means the smallest item of the cost of production, and their presence or absence often makes the difference between a profitable and an unprofitable year. Mr. C. F. Eckart, of a Hawaiian sugar company, therefore began experiments looking to weed-control. Says Mr. Howe:

"Weeds between the cane rows could be controlled by spraying, after which followed a demonstration that the weeds could be smothered by strips of paper, asphalt impregnated to withstand weather and handling.

"Knowing that cane shoots are tightly rolled up, sharp-pointed and spear-like, Mr. Eckart conceived the idea of using paper over the cane rows, being careful to have the paper of the proper construction to hold the weeds beneath, while the cane, by gentle pressure, could puncture the covering. Considerable acreages have been under experiment and several interesting developments have taken place.

"The paper in yard widths is placed over the rows and kept there by bamboo pegs, stones, and field litter. As the cane shoots come up those striking the paper at or near right angles puncture the covering and grow vigorously. The other shoots make tentlike elevations, at which points the paper is slit after five or six weeks, during which time the cane does not suffer, although the less hardy weeds are exterminated."

CHARLES L. PACK HONORED

Mr. Charles L. Pack, President of the American Forestry Association, and head of the National War Garden Commission of the United States, has just had the degree of Doctor of Laws conferred upon him by Trinity College.

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The Motor Truck in Logging

The improvement of means of transport in Canadian forest operations is closely allied to several outstanding problems in forest conservation. For example, the utilization of hardwoods in Ontario, Quebec and New Brunswick logging operations is yet unsolved. The resultant loss of forest materials each year is enormous, but the most serious feature is in the transportation of our forest areas into predominantly hardwood types. As forest industries for the greater part are maintained on coniferous woods it becomes a prime interest of forestry that the scope of profitable logging should be extended to include hardwoods and thus maintain a proper balance. Driving hardwoods by water for long distances is practically prohibitory owing to sinkage. Until cheap transport can be worked out, the double advantage of developing hardwood-using industries on a large scale and correcting degenerative tendencies in the Eastern Canada forests cannot be attained.

The following article by Richard Hilliard of Seattle, on "The Motor Truck in Modern Logging," will be found interesting, although its application is for Western rather than Eastern conditions.

Transportation has always been the big problem in logging, second only to labor in its importance. Any method which will enable the logger to get his timber quickly, and get the logs out to market dependably, economically and rapidly is a big stride in the right direction.

Today it is generally a question of yarding out, using a railroad or employing motor trucks. Of course there are certain types of show where special methods must be employed. You are familiar with many of them, where tram roads, cogwheel tramways and other ingenious methods are quite satisfactorily employed to overcome unfavorable natural conditions. But getting down to the

large majority of cases, where the terrain is fairly representative of shows in our Northwest country, from the spar tree to the pond, boom or railroad is the distance we must cover. Now, the motor truck is not a competitor of the railroad, nor of river driving. It is an ally. There are shows where it is obviously best to yard into the water; others where a railroad should be used; and yet others, and a very large number of them, where the motor truck and trailer is the only good solution of the problem.

The truck offers these advantages—the road can be put into the timber quickly and economically; it costs much less to build a logging truck road than a railroad; the equipment costs less and is more quickly assembled; the outfit is very mobile and can be changed from location to location quickly, the trucks pulling up and carrying the poles or planking used for the road and carrying the donkeys from location to location. The motor truck outfit is very flexible.

Where railroads are already in and it is desired to reach patches of timber a mile or more from the road, trucks can be used to get this timber out to the railroad cheaply and quickly—and speed is essential in these days of high prices for logs. Where railroads are not in, it is a question of going over the show and figuring out the best method.

The motor truck has long since passed the experimental stage in logging work; it is no more an experiment today than the donkey or the high lead or the locomotive. There have been failures with trucks, it is true, but in every case these have been due to improper equipment, poor roads or absolute ignorance of log handling. There are motor trucks working all through the Puget Sound country, and in other parts of the Northwest, giving excellent satisfaction and handling the logs cheaper than any other method.

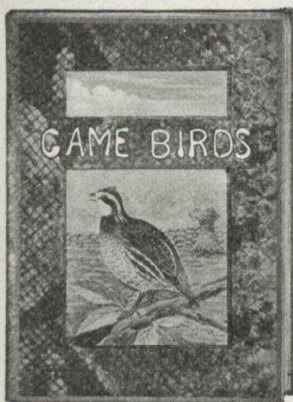
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Here's the big point that must not be forgotten—motor trucks are just as dependable a method of transporting logs as the railroad is; it is generally a question of which will best fit the individual requirements of the project under consideration. It doesn't make any difference whether it is a big show or a small one, the conditions govern the decision.

In some places the very long haul, or a rehauling problem or some other local condition, makes the railroad the right method; in others the speed with which the timber can be reached with a road, the fact that spar trees can be located where advisable and the road run to them easily, the lowered cost of road and equipment, and the flexibility and mobility of the truck units make the motor truck the best solution.

Unless you know which method will answer best—get an expert who thoroughly understands motor truck

logging. Then select the proper truck and trailer equipment. Then build good roads for the truck and trailer to work on, for the biggest mistake a man can make is to assume that because a touring car will run over a certain piece of dirt road that a truck weighing six tons and loads ranging from 12 to 20 tons can be hauled over it continually without trouble. A good road is just as essential to the motor truck as it is to the locomotive—and you know how important that is though the road for the truck will cost a great deal less than the road for the locomotive.

Curves, grades, etc., are not so important, with the truck as they are with the railroad, of course, and where planks or poles are used for trackage, ballasting is not necessary.

If you can use horses, you can use trucks, and do more work, do it quicker and easier and at far less



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expense. How many teams a truck will replace depends on the hauling conditions, length of haul and many other factors; but take this one instance of a motor truck and trailer, hauling on a two-mile plank road, handling 30,000 to 40,000 feet a day

at a cost of approximately \$18, including driver's wages, depreciation, interest on investment, taxes, gasoline, tires, oil, etc. What would it cost with horses?

The motor truck is unquestionably the new and big factor in logging.

With a Forester in Armenia

"The people out here grow Lombardy poplar as a timber tree. Little groves of it or now and then fair-sized patches is the nearest they come to forests. Most of it is grown in long rows along irrigation ditches. They trim it off along the trunk so that it develops into a very tall, thin tree. They use these poles as rafters, etc., in their mud houses. The really great need here is fuel wood. The people use manure cakes in their fires almost entirely, as only the wealthy can afford wood to burn. Twenty dollars (about) was the price I heard quoted for one cord. Except along the few river beds where willows, wild olive, and as far as I have seen, nothing else grow, this is a treeless country. In fact, the location of the villages is noticed by the presence of trees, which are on irrigated soil. My belief is that this is due to lack of enough water or to poor distribution of rainfall.

"Now, to get down to what can be tried out here. I have some Western yellow pine seed, and some Douglas fir. But it strikes me that some of the real desert trees of America, such as the mesquite, the Palo Verde, and especially the eucalyptus, might do well here. Also I am anxious to try out some of the dry site conifers such as the jack pine, all four of the nut pines, and any other extreme drought resisting species. It also seems to me that the ailanthus should do well on some sites here and make a welcome shade tree. Then the thought comes to me that there may be a number of Australian species which might fit and perhaps the Aleppo Pine, *Pinus halpensis* Mill, might be worth trying out. And are there not some very hardy species that grow on the dry

veldt in Africa and on the plains of the Argentine? As to the irrigated tracts it seems to me that there are better species than the Lombardy poplar. How about the American cottonwood? Could you send me a few cuttings or some seed to experiment with?

"I am writing this, and in fact we are all acting in our work, as if it was a sure thing that nothing in the way of another invasion of this district by the Turks and Kurds was going to take place. In reality we are always living on a powder mine here. There are some fifteen thousand refugees in Urumia and all around us thousands more. Three thousand fresh ones came in a little south of here about two weeks ago. Many of them were really almost naked and the poverty, famine, want and horror of it all make your heart ache. I am glad I came out to do what I could. This winter is going to be the worst that ever struck this region. Just at present it is summer and so warm that the poor people do not need clothes much. Also they manage to scrape up enough to keep alive, but when the cold starts in there will be the most terrible want that you can think of. I assure you that when you have a small mob of 50 Gilu, Kurdish and Syrian men, women and little children pressing around you, filthy, dirty, covered with sores, haggard and gaunt and all of them crying out for anything at all to eat, it makes you feel pretty hard toward the plenty of the United States and the way they are not making use of it. Why, one night's expenditures on wine, women and song along Broadway would save

the lives of whole nations out here. I thought that I had seen some of the poorest people alive when I saw some of the poor people of the New York

slums and the poor whites of the South, but they are bloated bondholders compared to these refugees. From "American Forestry."

The Problem in Abitibi

Mr. G. C. Piche, Chief of the Quebec Forest Service, who recently took control of the fire protection work in that province stated recently to an interviewer of the Quebec Telegraph some interesting facts concerning the new fire protective system in the Abitibi region:

"I have recently been to the Abitibi district on the line of the Transcontinental Railway, where I went to organize a fire protection service. It is a section comprising a large area of forest property of much value, and at the same time a rich agricultural centre. The land is extremely suited for agriculture and settlers are going there in large numbers. The constant rain of last season greatly delayed the settlers from clearance work. So this year they will have to do double the work, and it is expected that they will clear about 20,000 acres, scattered between the Nottaway and La Reine, about one hundred miles in length.

"The settlers at Abitibi, are distributed on each side of the Transcontinental Railway, some as far as ten miles apart. The Department requires that each settler should obtain a permit before burning his slash, as a precaution against forest fires, and the Department will employ ten special rangers during the dangerous season. Besides these precautions the Transcontinental Railway right of way requires a good deal of attention on account of the growth of scrub and grasses, part of the debris that have been accumulated and not burned or removed. These conditions make it necessary to acquire and maintain sprinklers that will follow the trains as they pass this section to extinguish any fires that may be started by the sparks from each train.

"In addition to these sprinklers

special pumps with adequate equipment will be installed along the line of railway, and distributed at various given points at combat fire. It will mean a big expense, but the Government desires to protect the settlers' lives, as well as their property, and prevent a repetition of the terrible calamity at Cochrane two years ago, when two hundred miles of timber limits were burned, and 220 lives lost in the flames, that swept out of existence villages, and caused such dire results generally.

"The Transcontinental Railway authorities have promised the Quebec Government to assist in this matter of expense and protection, because they are also interested, especially in the welfare of the country, or section of the railroad which has and is giving the railway a heavy and lucrative business, in both the passenger and freight branches of the service, and as the railway officials admit, much more than they ever expected.

"The forest fire protection service as merged with great success by the several protective associations organized by the lumbermen of the Province is such that the gross results in a general way, is far ahead of all other Provinces in the Dominion. The people of this Province have come to realize more than elsewhere, what forest fires mean as a medium of destruction to themselves as well as the Province, and the Government on this account obtains more co-operation from the people than any other Province in the Dominion. But' this does not prevent forest fires continuing, until a proper system of education in regard to the settlers is practically placed before them, that will cause even more precautions against forest fires.



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FORESTRY IS FORESIGHT

There is urgent need for a definite stock-taking of the commercial timber and pulpwood now available. Mathematical accuracy is not essential, but sufficient cruising and gathering of data should be completed to permit of reliable estimates being made, much work has already been done by the Commission of Conservation in British Columbia. Similar work will be done in Ontario, as soon as the funds are available and the necessary organization has been completed. Then, too, the provincial government of New Brunswick is engaged in making such a survey. As yet, however, only a partial methodical stock-taking has been made of the available pulpwood supplies of Quebec. Quebec has, however, the most important pulpwood area in Canada. The transportation facilities of the province, both natural and artificial, are excellent for the delivery of pulpwood and pulpwood products on the important markets in America and England.

Much additional information as to the amount, distribution and accessibility of these pulpwood areas should be ascertained. Then, measurements of each tree in typical areas

set apart for that purpose, should be made from time to time to ascertain the natural annual increase in diameter under normal conditions in the forest. This information would make possible a close estimate of the probable duration of the supply.

But unless there is a replacement of the trees removed, it is obvious that the supply can only last for one generation of trees. In a study of a limited area in the St. Maurice valley, Dr. Howe found that balsam and hardwoods predominate in the new growths, and that spruce and pine are being steadily and surely depleted. By practising scientific forestry and by discovering means for utilizing the hardwood forests profitably, much may be done to correct this defect. However, to improve upon nature, it is necessary to know how nature acts and reacts upon the thing we wish to improve. Thus far, no determined and sustained efforts have been made in Canada to get such data in regard to forests. It will be essential to discard the trust-to-luck-and-to-nature policy and substitute therefore a policy based on knowledge obtained by scientific studies of conditions.

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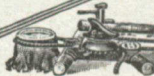
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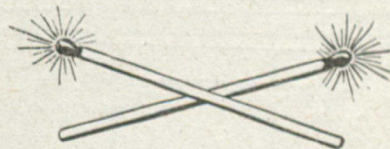
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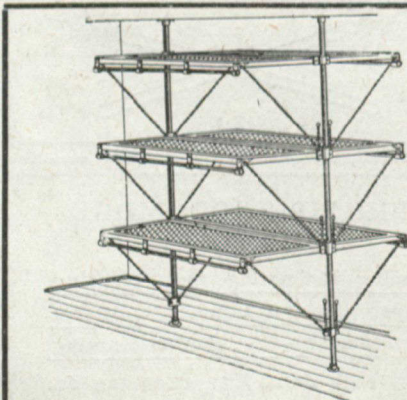
Courtesy "Canadian Lumberman"

CANADIAN FORESTRY CORPS FOOTBALL TEAM AT CATFORD, ENGLAND

The Canadian Y.M.C.A. with the Overseas Military Forces of Canada is conducting a big work, for the men of the Canadian Forestry Corps in Great Britain and France. Here and there in the romantic old forests of England, up among the Highlands far north in Scotland and in the forests of France, are located camps of Canadian lumbermen in khaki.

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Corps, which is served by the men of the Red Triangle. At Catford no timber cutting is done, the camp being used for the setting up and assembling of the mills which eventually find their way into the outlying forests, where cutting is in progress. The Y.M.C.A. centre at Catford is styled "The Canadian Forestry Club," and is carrying on a useful work in a social way, for the men stationed there.



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