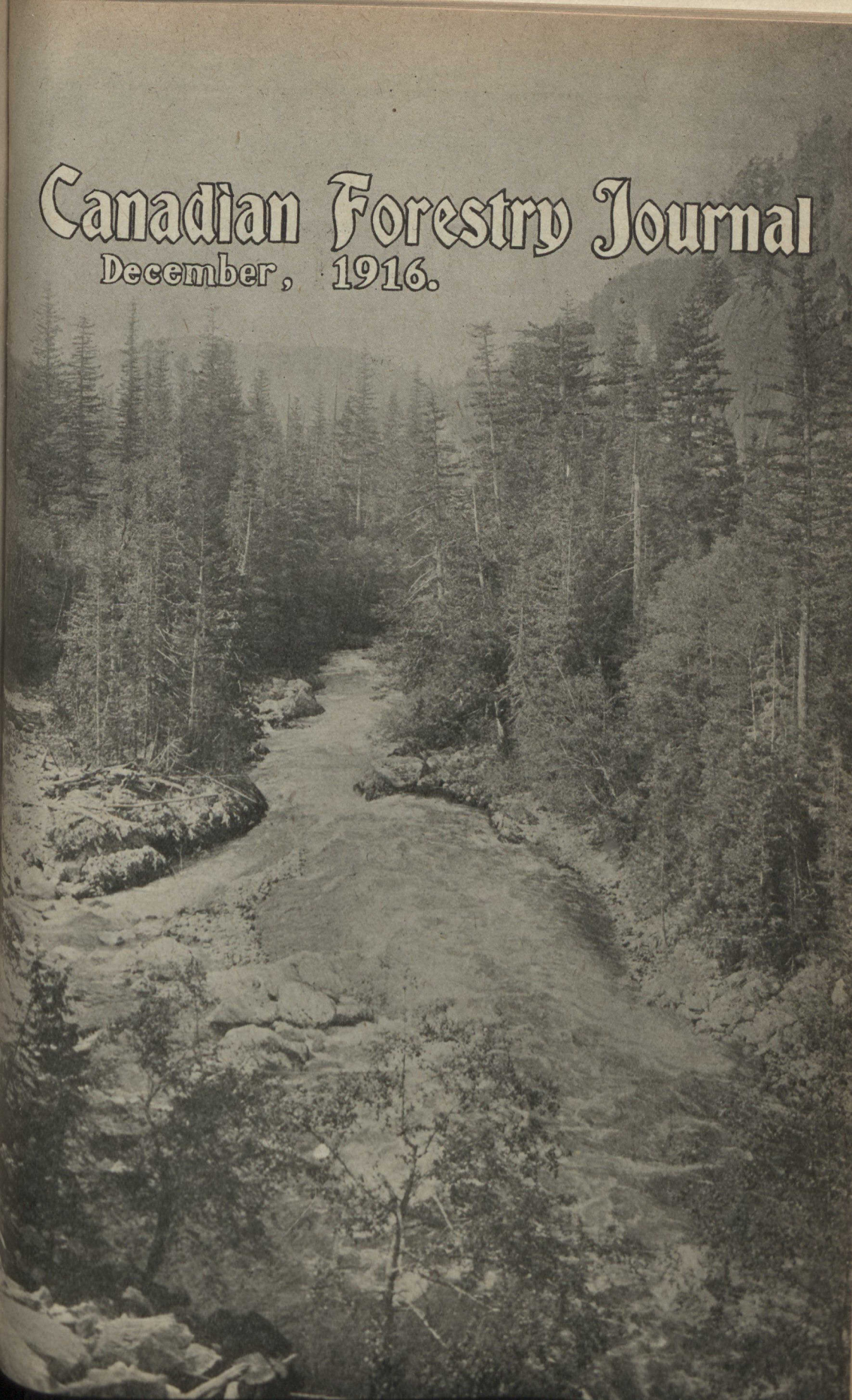
Canadian Forestry Journal

December, 1916.



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CONTENTS FOR DECEMBER

No. 12

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A PRACTICAL LESSON IN FOREST DESTRUCTION.

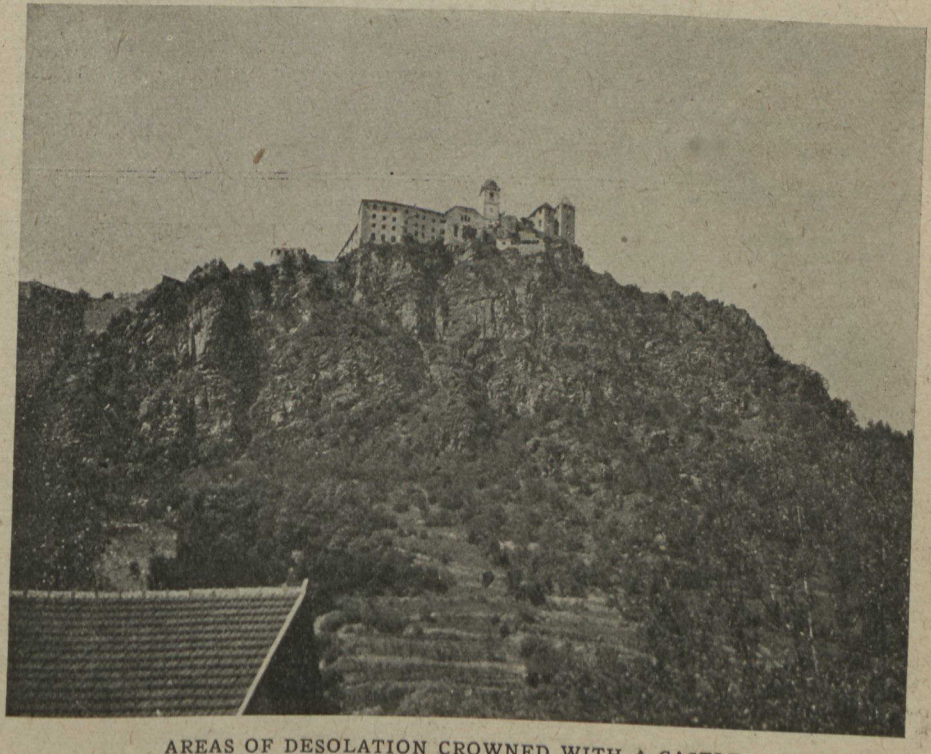
These precipitous mountain slopes near the Austro-Italian international boundary line were once covered with a forest growth. Their present appearance evidences the destructive work of the past, the present lack of water and the parching heat of the sun.

THE ABUSE AND RIGHT USE OF LAND.

Along the coast of Lake Garda, which is crossed by the Austro-Italian international boundary line, are found extremely productive and intensively managed lemon and olive groves, and bordering them at higher elevations are some of the most sterile mountain slopes in the civilized world.

VALLEY OF THE ADIGE AT TRIENT.

This is a portion of the land Italy hopes to regain from Austria. Throughout the entire region the valleys are narrow and fertile, the mountains high and rugged, and their slopes steep, sterile and denuded of the forest growth that once covered the now exposed diorite rocks.



AREAS OF DESOLATION CROWNED WITH A CASTLE.

Steep slopes of exposed rock originally forested, but now covered with an open growth of inferior trees and shrubs. A thousand years ago the building crowning the height was a fortified castle, later it was converted into a monastery, and now it is used by the Austrian army operating south through Tyrol.

A Ranger School in Operation

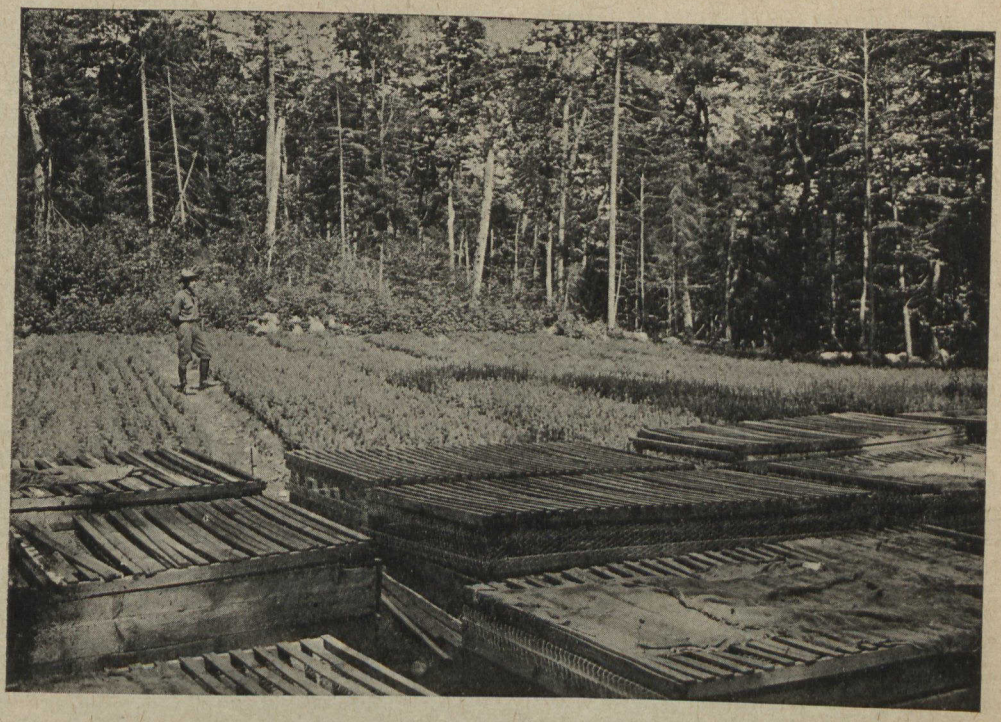
Training Men By Short Courses for Fire Protection, Tree Planting, Estate Management, An Example for Canada

That the best results from the employment of forest rangers cannot be reached until the political patronage system of appointment is eliminated has long been recognized. There is a further necessity in any effective, and hence economical, plan of forest guarding: the training of the rangers. In the European systems, courses are provided for those who, without intending to qualify as forest engineers, desire proficiency in the secondary duties of the forest service. The idea has been adapted in America in the Ranger School, with amplifications to meet special conditions. In the following article, prepared at the request of the Canadian Forestry Journal, Mr. S. D. Smith, Director of the State Ranger School at Wanakena, New York, discusses the work of the institution. With the improvements taking place in the various provincial and federal forest services of Canada, a Ranger School established in Ontario, Quebec, New Brunswick, British Columbia, and at a point to serve the prairie provinces, would seem a sterling undertaking on the part of the governments responsible for protective work.

Objects of the School.

The primary object of the State Ranger School, maintained by the New York State College of Forestry, is to give young men thorough practical training which will enable them to take up work in Forestry and its associated callings such as managers of private forests, forest guards or rangers, and specialists in planting and growing young trees. This is not inclusive of

THE RANGER SCHOOL GROUNDS FROM THE OSWEGATCHIE RIVER.



The teachings of the class room are supplemented by actual field practice. In this nursery the stock is grown for planting on the College Forest. Approximately 50,000 young trees are planted annually by the Students.

the various positions with large lumber companies and pulp and paper concerns as timber cruisers an din map making and surveying.

No man can be a good forester in the broadest sense of the term who cannot take care of himself in the woods, and as a large part of the regular instruction of the School, field trips, and excursions are planned to enable the men to develop all that is possible of ingenuity and responsibility in providing proper food and accommodations for themselves when at considerable distance from their base of supplies. But this field work is in no sense a vacation. It is just as essential as the instruction in the class-room and frequently is of several weeks' duration.

Any young man of good moral character and in sound physical condition over nineteen years of age is eligible for admission to the School. Every effort is made to exclude from the School all those whose tendencies or characteristics would retard their development or would injure the well-being of the student body. Every student is taken on probation for one month, since it has been proven unwise to carry a students whose inclinations and ambitions are not in accord with the School. It is obviously unfair to a young man to continue him in the school work when it is clearly proven that the profession holds nothing for him.

A Short Course in Forestry.

Although several of the larger universities have graduated men as professional foresters, there is yet quite a field between the lumbermen and the professional foresters, and it is this field that the Ranger School is endeavoring to fill. ,Many of the young men of this and neighboring states could not see their way clear to enter the regular university four-year course, nor could they obtain the help they needed from text-books or treatises on the subject, and this class of young men have been very eager to secure the benefits of this short course in Forestry.

The school is located at Wanakena,

N.Y., in the Western Adirondacks, where opportunity is provided for demonstration and field work in surveying, mapping, and timber estimating. In this vicinity several large tracts are being lumbered at the present time, and the students are privileged to visit and study the lumber camps and the mills of the pulp and paper companies. Through the generosity of the Rich Lumber Company the school owns and maintains its own forest, consisting of approximately 1,800 acres. Adjoining this on one side is a State forest of virgin timber of several thousand acres, which also offers excellent opportunities for the demonstration of the principles of Forestry.

For Comfort of Students.

Good warm buildings are provided for the accommodation of the students. The main building consists of an office, class-room and recreation room on the first floor and dormitories on the second and third floors. The dining hall is also neat and well equipped. Both buildings are provided with running hot and cold water. Equipment in the way of tools and instruments are furnished for demonstration and actual use of the students in surveying, estimating and accurate mapping.

The location of the school on the inlet to Cranberry Lake makes transportation by water often necessary, and for this purpose motor boats and canoes are maintained by the school.

Lumbermen Co-operate.

The school does not guarantee positions to its graduates, but all assistance possible is given by the school in locating its graduates in positions which offer opportunity for advancement. The school does not furnish a complete education in forestry; but the courses given will fit a man for general practical forestry work and give him a thorough practical working knowledge of the subject. The aim is to make the course practical, avoiding so far as possible the purely theoretical part. It is worthy of note that the lumbermen who at one time gave little credit to this work are now much interested in it, and are glad to detail special problems in their operations for solution by the students of the Ranger School. The practicability of the school is doubtless what appeals to them and explains why its graduates are so satisfactory in the service of these men.

Lieut. George E. Bothwell Killed

Lieut. George E. Bothwell, of the Forestry Branch of the Department of the Interior, who enlisted in the 51st Battalion of Edmonton, has, according to unofficial reports received, been killed at the front. Mr. Bothwell enlisted as a private and worked his way up to a commission, and crossed to the front in France in the summer of 1916. After the advance of the British forces on the 15th September Mr. Bothwell was officially reported "missing," but no further word could be obtained as to his fate until his father, who lives in Perth, Ontario, received a letter from one of the other officers of his company giving details of what happened. It appears that the British troops had made a victorious advance and captured the enemies' trenches, and that Mr. Bothwell's company had rounded up a number of prisoners who had surrendered in a dug-out. Apparently the prisoners had not been fully disarmed, for when Mr. Bothwell's back was turned one of them suddenly drew a revolver and shot him in the back of the head, killing him instantly. It is very regrettable indeed to lose a promising young forester like Mr. Bothwell, and particularly as a result of such a treacherous act.

Mr. Bothwell was employed at the head office of the Forestry Branch for a short time, and while there prepared a bulletin on Co-operative Forest Fire Protection, which described the work of the forest protective associations formed by the lumbermen, particularly in the St. Maurice Valley. He afterwards worked as assistant on the Athabaska division of the Rocky Mountain Forest Reserve, and gave promise of being a very useful field officer.

Ontario Adopts a Forward Policy

Government Announces Reorganization of the Forest Protective Service, Under New Department, and Control of Settlers' Fires

Reorganization of the forest protection service of the Province of Ontario has been decided upon by Hon. G. H. Ferguson, Minister of Lands, Forests and Mines. Announcement of his plans was made before a delegation organized by the Canadian Forestry Association which discussed the subject with the Minister at Toronto on Tuesday, November 28th.

The announcement, far from being a "promise to consider," gave a specific outline of reorganization to which the Government is pledged to adhere. Edmund J. Zavitz, Provincial Forester, is appointed head of a new forest protection department which includes, as well, all work relating to forestry. The Minister gave assurance that the new department, which will be under his own general supervision, will be given every facility to work out a comprehensive and effective system. The matter of additional appropriations, he said, could be arranged without difficulty.

To Take Care of Settlers.

Under the new forest protection chief, there will be developed a scheme of issuing "permits" for the burning of settlers' slash, which the Department recognizes as the great source of dangerous forest fires. Under the system proposed, settlers will be allowed to burn off their debris only under proper weather conditions and by personal direction of a fire ranger. There will also be worked out a plan for applying to forested country such modern improvements for fire detection as lookout towers, telephone lines, trails, and other equipment. In presenting this excellent programme, the Minister clearly emphasized that his decisions were the result of much consideration and the study of protective systems in other parts of the country. His public announcement had been withheld until the deputation could appear before him and present its views. It was his intention to have Mr. Zavitz proceed with the new work without delay so that the season of 1917 would witness part at least of the new plans in effect.

Mr. Ferguson said that his department had not been slumbering in forest protection duties, but had employed in some seasons 1,000 rangers. Within the Reserves, permanent improvements had been carried on on an extensive scale. Reforestation had been taken up, and in many parts of the province old limits were being cared for with a view to their future value. The patrolling of the Claybelt country, in particular, was a difficult proposition, for the influx of settlers in recent years had developed special problems of fire control.

Faults of Present System.

The delegation which the Canadian Forestry Association brought before the Minister to talk over the forest protection problem was an uncommonly strong and representative body of men. Lieut.-Col. J. B. Miller, President of the Association, briefly introduced the subject of the interview and called upon the Secretary, Mr. Robson Black, to read a memorandum. The latter document contained a detailed criticism of present organization of the forest service of Ontario on both licensed and unlicensed lands, the absence of skilled management of rangers, the lack of inspection and consequent poor results. The need of a settlers' permit law and the construction of fire detection and fire fighting aids, such as telephones, trails, etc., was plainly discussed.

Pointed Evidence.

Brief comments were made by most of the members of the deputation, all expressing confidence in the Minister's intentions to place Ontario's forest service in the front rank of Canadian provinces. Mr. Ellwood Wilson, President of the St. Maurice Forest Protective Association of Quebec, gave a succinct outline of the results obtained from the use of modern protective methods. The application of a settlers' permit law did not alienate the settler, as some might anticipate. Tactful education was a sufficient weapon to overcome prejudice, and the threat of legal penalties sufficed for the few recalcitrants. Mr. Frank Hawkins, as Secretary of the Lower Ottawa Forest Protective Association, gave the Minister a valuable resumé of the success in combatting fire during 1916. Sir Edmund Walker, President of the Canadian Bank of Commerce; Mr. W. E. Bigwood, President of the Canadian Lumbermen's Association; Mr. James White, Deputy Head of the Commission of Conservation; Mr. Parsons, Vice-President of the Canadian Manufacturers' Association; Mr. T. H. Hall, representing the Canadian Fire Underwriters' Association; Mr. Arthur Hewitt, President of the Toronto Board of Trade; Mr. James Simpson, representing labor unions of woodworkers; Mr. Cyril T. Young, of the Canadian Northern Railway; J. G. Elliott, President of the Canadian Press Association; C. M. Auer, representing Porcupine mining interests, and the township of Tisdale and town of Timmins in Northern Ontario, presented very helpful comments. The latter speaker frankly told the Minister that the fire hazard had been greatly increased by the 1916 conflagrations, and that the population could not be held in the country if prompt protective measures were not taken.

The Association's Part.

The introduction and conclusion of the Canadian Forestry Association's memorandum were as follows, (the body of the document containing detailed observations of the Ontario system being omitted here for lack of space.)

"The part played by the Canadian Forestry Association in relation to the Ontario forest protection system has had as its object the educating of public opinion upon the value of the forest possessions and the wisdom of guarding them against the waste of fire. Such questions as the extent of forest fire losses, the dependence of forest industries upon accessible and abundant supplies, the profitable results of modern patrol systems, the common-sense of the 'permit plan' for controlling settlers' clearing fires all required discussion and in affording the means for this we aimed to bring the people to intelligent conclusions as to their existing forest laws and administration.

"The effect of the educational campaigns has been to stimulate public conviction and to provide necessary support for this Government in adopting an advanced policy. We come before you to-day not to emphasize what we believe are the shortcomings of the system which has been inherited from previous Governments, but to assure the Minister of Lands, Forests and Mines of our full confidence in his desire to give Ontario the most useful plan of forest protection that can be devised. We congratulate him upon the investigations he has set in motion for the securing of full information, and do not doubt that the new basis of organization for forest protection purposes will bring the province of Ontario within reasonable reach of its great responsibilities. . . . . .

"We recognize that the rousing of public sentiment on the question of Ontario's forest service has been due more to the terrible loss of life in the Clay-belt fires that to any other consideration. The lack of official data on provincial forest conditions, annual losses from fires, etc., as reflected in the annual reports of the Department of Lands and Forests, has been partly responsible for previous public indifference to the seriousness of the situation. What was not reported upon by the Department was too often accepted as a matter of no public concern.

"The proof of the efficiency of modern protection systems is available on every hand, in the 24,000 square miles of privately-managed limits of Quebec,

in the whole of British Columbia, in the Pacific Northwestern States, and in some of the Ontario Reserves.

"In practically all of these areas, the freedom from forest fire damage to life and property can be ascribed to three main features:

"Power of control by the rangers over settlers' clearing fires through the 'permit law.'

"Centralization of ranger control; skilful management; with frequent inspection.

"The development of mechanical equipment, as trails, telephones and lookout towers.

"It is to these foundations of every successful protective organization now in existence that we direct the attention of Ontario, feeling confident that the Government will not hesitate to place the forest guarding system upon the most modern and efficient basis."

Loan to Settlers.

The first $100,000 set apart by the Ontario Government for loans to northern settlers has been applied for almost entirely, according to a summary issued by Commissioner Dane. Over sixty-two applications were received from Matheson.

Application forms for loans were first sent to the Timiskaming district because of the distress following the recent forest fires there, and resulted in 258 applications for aid, amounting to $92,790, from the district of Timiskaming.

Application forms are now being sent out to the agencies of Port Arthur, Dryden, Rainy River and Kenora. The settlers in the burned districts show by their applications that they intend to use the money loaned to them for developing their farms, relying on the Northern Ontario Aid Committee for their re-establishment.

All the applications recorded above have received the sanction of the Crown Lands Agent for the district, and the loans are either going forward or are only held up for technicalities regarding titles to the lands offered by the settlers as security.

Late John Hendry's Estate.

The gross value of the estate of the late John Hendry, of Vancouver, a former President of the Canadian Forestry Association, was $1,248,829.23, and the net value was $725,783.63. The usual petition for administration of the estate was filed November 1st, on behalf of the executors, Mr. Eric Werge Hamber, son-in-law, and Mrs. Adaline Hendry, the widow. Under the will, dated June 18, 1914, three-quarters of the real and personal estate and effects pass to Mrs. Adaline Hendry and one-quarter to Mrs. Aldyen Irene Hamber. The widow's share is estimated as $544,337.87 and the daughter's as $181,445.98.

The major share of the fortune is made up of shares in the British Columbia Mills Timber and Trading Company, in which the inventory shows the testator owned 6,336 shares of a par value of $100 and a present value of $150, making a total of $905,400. The testator's shares in the British Columbia Sugar Refining Company were valued at $12,000; the Hendry Land Company at $19,875; the Western Canada Power Company, Limited, $48,500, and the Yale Development Company, $45,000. The total value in shares is placed at $1,080,830, and the real estate at $148,955. The shares in the Vancouver, Westminster, and Yukon Railway Company—25,020 in number—were given as of no value.

Penny Wise—Pound Foolish.

(Pulp and Paper Magazine.)

In one part of the country we find progressive paper makers and lumbermen not only carefully guarding against the destruction of their forests by fire but planting trees for future requirements. In another part of the land we find careless settlers setting fires to clear their land, or hunters and campers leaving fires which they carelessly allow to spread at will.

To plant trees for future requirements is a most praiseworthy proceeding, but to allow millions of acres to burn down each year makes our efforts at conservation look sick. It is a Penny Wise—Pound Foolish Policy.

The Heliograph in Forest Fire Detection

Experiments Conducted on Mattagami Pulp and Paper Company's Limits Appear to Demonstrate Its Usefulness

The heliograph as a signalling instrument has been used by military engineers for a great many years, but it remained for the Mattagami Pulp and Paper Company of Smooth Rock Falls, Ont., to adapt it to forest protection purposes.

The success of the heliograph is vouched for by the rangers on the company's limits and by Mr. R. O. Sweezy, a well-known Forest Engineer, who worked out the company's fire protection plans. Mr. Sweezy's experience as professor of engineering at the Royal Military College, Kingston, brought him first into touch with the heliograph which was used in instructional work with the cadets.

In mapping out the patrol routes, locations for lookout towers ,etc., it was found necessary to devise a signal system other than telephones and wireless. The company's limits comprise about 1,300 square miles, mostly devoid of roads. To construct telephone lines, particularly during war time, with materials enormously enhanced in cost, was considered inadvisable. Mr. Sweezy experimented with a few heliographs and succeeded in teaching some of his rangers enough of the Morse code in a week or two to enable them to flash messages to and from the lookout towers. So well did the plan work that more instruments were purchased and placed on other sections of the limits. The heliograph, as is commonly known, operates by the use of two mirrors, one of which is attached to a key. By operating this key on the "dots and dashes" system of the telegraphic code, the flash of reflected sunlight can be controlled at will.

It is a general impression that without brilliant sunlight these instruments would be helpless . This was not found to be the case. Even with a heavy haze, the flashes penetrated to a distance of ten miles and over. In rainy weather of course the fire ranger would have less urgent need to signal. For use at night, electric flash lamps were employed, and for short distances worked very well. The same code of "dots and dashes" was used. To overcome the handicap of night signalling, a new powerful battery lamp has been manufactured in the United States, which is said to give a flash visible at thirty to fifty miles. This lamp will probably be tried out next summer on the Mattagami limits.

While the heliograph has its limitations, those who have witnessed the experiments in forest signalling last summer declare that its usefulness warrants a wider adoption. An instrument with tripod costs about $50 in normal times, but has advanced by about $20 recently. It is not cumbersome or heavy, and can be stowed away in a pack very easily. Learning the code does not prove difficult, and practice for a week or two is said to be sufficient.

The country in which the experiment was tried does not differ materially from the rest of the Claybelt of Northern Ontario and Quebec—relatively flat country with sufficient rising land to provide positions for lookouts giving a clear survey for great distances.

The use of the heliograph will be assisted by telephone lines constructed along the main roads and telephone extension will keep pace with the company's woods operations. Rangers on the canoe routes will likely be provided with heliographs next season.

What Real Fire Protection Does in Quebec

The following tabulation of losses sustained within the area patrolled by the St. Maurice Forest Protective Association of Quebec during 1916 has much interest for readers of the Journal.

On nearly 13,000 square miles of territory, the fire damage to merchantable timber was $700.83; to young growth,$1,185.88; to cut over lands,$3,484.50,

Such a record of comparative immunity is a monument to the efficiency of correct patrol methods. Mr. Ellwood Wilson is President of the Association, and Mr. Henry Sorgius has achieved a reputation as manager.

The experience of the Association in the matter of controlling settlers' fires has been excellent. The present happy relations with the settlers is a matter of tact and education, rather than the rigorous use of legal penalties. The excellent record of the Lower Ottawa Forest Protective Association is not immediately available, but illustrates equally the point that prevention of forest fires is a matter of vigorous co-operation.

Territory Under License.

	Acres.	Valuation.	Value
Merchantable Timber	$ 449.25	$1.56	$700.83
Young Growth	1,091.75	.50	545.88
Cut-over	4,646.00	.75	3,484.50
Old Burn	1,867.50	.10	186.75

Territory Not Under License.

	Acres.	Valuation.	Value
Young Growth	1,280.00	.50	640.00

Settlers' Lots.

	Acres.	Valuation	Value
Young Growth	5.00	.50	2.50
Cut-over	6.00	.75	4.50
Old Burn	195.50	.10	19.55

Town of La Tuque.

	Acres.	Valuation.	Value
Old Burn	1,280.00	.10	128.00

Canadian Pacific's Wood Requirements

The enormous quantity of wood products used by the Canadian Pacific Railway is indicated in the following statement by Mr. George Bury, Vice-President, in reply to a request from the Journal:

Track Ties	5,000,000
Switch Sets	5,000 sets
Fence Posts	200,000
Telegraph Poles	50,000
Piles	20,000
Shims	5,000,000
Tie Plugs	25,000,000
Lumber	60,000,000 feet

Canada's White Pine in Danger of Extermination

Ravages of White Pine Blister Rust Developing serious Conditions in Ontario and Quebec

The spread of the white pine blister rust in Canada has reached such dangerous proportions as to call for prompt measures by our Governments, lumber companies, and individuals. Unless effective means are taken at once, Canada may easily witness a tragic loss of white pine, far more serious than the destruction of tamarack by the larch saw fly.

Canada's white pine possesions have been reduced so seriously by causes other than disease that no effort should be spared to grapple with the new problem of blister rust at the outset. A few months' delay and remedies may be of no avail.

Already the disease has found its way into Simcoe, Durham, Wellington and Victoria counties of Ontario, and most seriously into the Niagara Peninsula. Mr. E. J. Zavitz, Provincial Forester, and Mr. W. A. McCubbin, of the Central Experimental Farm, Ottawa, have been at work for months discovering and defining infected areas and taking measures to isolate and destroy diseased trees and the gooseberry and currant bushes which act as carriers.

Danger to Quebec.

In Quebec, outbreaks have been found near Montreal, at Ste. Anne de Bellevue, and other points. Mr. G. C. Piché, Chief Forester of Quebec, has given prompt attention to the danger, and inspectors have been sent out with instructions to locate diseased sections and apply proper remedies. In the State of Maine, within a short distance of the Quebec border, a serious outbreak has been located, which may easily cause trouble for neighboring Canadian areas of white pine.

Considering the enormous values at stake, and the rapidity of infection, characteristic of the blister rust, it would seem only a matter of wide awake business management that the Dominion Government as well as the provinces of Ontario and Quebec should take this grave matter promptly in hand. To eradicate the present plague of white pine blister rust will require not only a wide investigation of white pine areas, but a very considerable expenditure of money, and the employment of all the skill that Federal and Provincial Government departments have at their command. The aid of the Dominion Government is called for by the peculiar urgency of the situation, and the national consequences that must follow anything but the most comprehensive and thorough treatment.

Quarantine Measures.

Outbreaks in the United States have been located thus far in all the New England States, New York, New Jersey, Pennsylvania, Ohio, Indiana, Wisconsin, and Minnesota. Although it has not yet been found West of the Mississippi, prevention of the shipment of nursery stock from the east and the quarantine of infected areas will be necessary in order to prevent such a development.

Expert opinion holds that the blister rust can be suppressed by the following means:

The destruction of all gooseberry and currant bushes, wild and cultivated, in and near sections where the disease prevails.

The destruction of all five-needled pine trees exhibiting signs of blister rust infection.

Prohibition of the shipment of white pine seedlings from infected sections.

Rust Characteristics.

The blister rust which is parasitic on white pine can be detected on currant and gooseberry bushes as a yellow rust on the under side of the leaves. On these host plants it undergoes a change about the end of June and another form of spore develops. This is carried by the wind to the white pine. As wild gooseberry and currant bushes are to be found all over Eastern Canada, there are plenty of host plants to generate destruction of practically every white pine tree we possess.

This calls for immediate action by lumber companies, by Provincial and Federal Governments, by all who have any interest in or responsibility for the saving of white pine forests. To locate infections, and to destroy the diseased trees and all gooseberry and currant bushes in the vicinity comprises the only effective procedure known. Guarding against infected nursery stock is, of course, an obvious necessity. As for the origin of the white pine blister rust, it is supposed to have been brought to America from Germany on white pine seedlings.

A recent conference of officials interested in suppressing the epidemic was held at Albany, N.Y., and in addition to delegations of experts from most of the states where the rust has developed, the following were present from Canada: Clyde Leavitt, Forester, Commission of Conservation; F. J. Zavitz, Forester of Ontario; B. R. Morton, Dominion Forestry Branch; W. A. McCubbin, Division of Botany, Central Experimental Farm, Ottawa; G. C. Piché, Chief of Forest Service, Quebec.

Blister Rust in B. C.

There is reason to fear the white pine blister rust has secured a lodgment in the interior of this province, in which case infection must have come from one of the border states, says the Western Lumberman."

"Some four or five years ago, if we mistake not, the attention of the Provincial and Dominion authorities was directed to a mysterious blight that seemed to be attacking trees in some parts of Okanagan district. An investigation was conducted by an expert from Ottawa, but unfortunately very little was then known about Pine Blister Rust, and beyond recommending the destruction of the affected trees the expert had no advice to offer.

Logger in Daring Feat.

A few weeks ago the crew of Higgins' logging camp at Cameleon Harbor, Tribune Channel, about 80 miles north of Vancouver, witnessed an act of remarkable daring and agility, performed by one of their number, which will doubtless be talked about for many a day in the Coast lumber camps, where feats of daredevil bravery are as common as "scraps" among school boys.

In the course of a shift to a new logging location it became necessary to attach a cable to a very tall tree at a point 120 feet from the ground. Usually this is done by a workman equipped with pole-climbing spurs and belt, but this time these means were not available. What was to be done? It would take several days to secure the equipment from Vancouver, and a shutdown of the operations for that length of time was not to be thought of owing to the heavy expense involved.

This is where tall Andrew Busby came to the rescue, if reports are true. He was an expert chopper and skilled in using a springboard. With his axe and two springboards he began to climb the tree. Standing on the first board, he chopped a notch five feet above him, slipped the second board into the notch, climbed up, and, drawing the first board after him, repeated the performance a score of times. In an hour, while his companions below watched him breathlessly, he reached the top of the tree and affixed the rope. Standing on a board a few inches wide, he was apparently as cool at 100 feet from the ground as when he was only five feet from terra firma.

Busby is now a private in the 230th Forestry Battalion, having enlisted in Vancouver a few days after performing the act above recorded.

Where a Settlers' Permit Law is Needed

TYPICAL STAND OF SPRUCE AND JACKPINE ON THE EDGE OF AN OLD BURN IN THE RIDING MOUNTAIN FOREST RESERVE, MANITOBA.

YOUNG MIXED FOREST OF PINE AND SPRUCE IN ATHABASCA RIVER VALLEY, ALBERTA.

How Long Will Our Timber Last?

A Frank Discussion of Forest Problems in Quebec Province With An Outline of Needed Reforms

What is the timbered area?
How much of it is accessible?
What is the annual consumption?
How long will the timber last?
To what hazards is the timber exposed?
How is it being exploited?
What are the wastes?
How can the stand be converted and improved?

Mr. Ellwood Wilson, Chief of the Forestry Division of the Laurentide Company, Grand'Mere, Quebec, was asked to appear before the Dominions Royal Commission at Montreal to give information as to the forest conditions in Quebec Province. Mr. Wilson's memorandum is of such interest and value, containing original data and offering candid opinions on many features which are commonly passed over, that the Forestry Journal has condensed portions of the manuscript, omitting the statistical basis.

The statement of Quebec conditions refers to that part of the province lying north of the St. Lawrence River. The total area timbered is about 303,855 square miles. The area accessible at the present time to points of consumption is 147,247 square miles and the inaccessible area 101,722 square miles.

The total amount of available standing timber, states Mr. Wilson, is 363,603,200 solid cords of wood or 483,592,256 stacked cords. The memorandum proceeds:

Growth in Virgin Forests.

"Now timber is like gold, or iron, or coal, or any other natural product, in that there may be immense quantities of it in any given locality, but if it costs more to get it to market than it can be sold for, it is for the time being, or until the price rises sufficiently, inaccessible—and this must be taken into consideration when estimating timber supplies.

The approximate total consumption for spruce and balsam for 1915 was about 3,050,281 cords, which would give us at the present rate of consumption enough available timber for 150 years. Our consumption has increased, however, 290% in the last seven years, and if we allow only 10% per annum, at the end of 55 years all of the timber at present available would be used up. Now here a very important question comes up—and that is the amount of growth in a forest each year. At first thought it seems that a forest of growing trees will increase the amount of timber from year to year, and this is true of forests which are under control, or of an area which is growing trees for the first time, but it is not true for a so-called virgin forest which has been growing for an indefinite number of years, and in which trees of all ages and different species are found. Here nature has reached a state of equilibrium and the amount of growth each year is balanced by the amount of decay. So that if we have areas stocked by nature and there is a certain amount of timber on them, there will be practically no more on them at a given number of years than there is at present. This, however, does not hold good for areas which are lumbered, for here, the cutting out of certain trees gives an opportunity for a new crop, and this crop will continue to grow and produce timber until the land is fully stocked again, provided the conditions are right for the re-seeding of the proper species and their growth into mature trees.

Timber Cut Rises.

"In discussing this whole question I should like to draw my conclusions from a smaller region with which I am more familiar, and leave the question of the whole Province for those who have travelled more widely than I.

"For the last twelve years I have worked in the valley of the St. Maurice River, and have surveyed and mapped an area of about 2,500 square miles, and have travelled over practically the whole valley. I have also made careful studies of the amounts of timber on sample sections over the whole of the area, and studied conditions of growth and reproduction, and am in consequence able to give facts from which anyone can draw his own conclusions.

"The valley of the St. Maurice River contains about 12,329 square miles, and has all the timber types of the province except the Northern Subartic.

"The approximate amount of timber cut in this section for 1915 was 408,516 cords. This is a little under the total quantity, as I was not able to obtain exact figures for timber taken out by rail by one or two of the smaller operators. In 1910 the amount taken out was 282,720 cords, so that in five years there has been an increase of more than 140%, and this is at about the rate of 28% per annum.

Fifty Years' Supplies.

If we take it that the increase will be only 10% per year for the future we find that on the basis of our estimate there is only *standing* timber enough for fifty years. Areas which have been burned over cannot be counted on to produce pulp wood in sufficient quantities to be cut under forty years at the best, and areas which have been lumbered show that there is not sufficient timber left under the diameter limit set by the government to produce within thirty years more than three to five cords to the acre, and the figure is nearer three cords than five. If we say that the total area lumbered up to the present time will produce at the end of fifty years ten cords to the acre there will be at the time the standing timber is cut off just about enough to take care of the consumption at that time for one and a half years. The growth on the areas lumbered each year from now on will not be sufficient to take care of the increased cut.

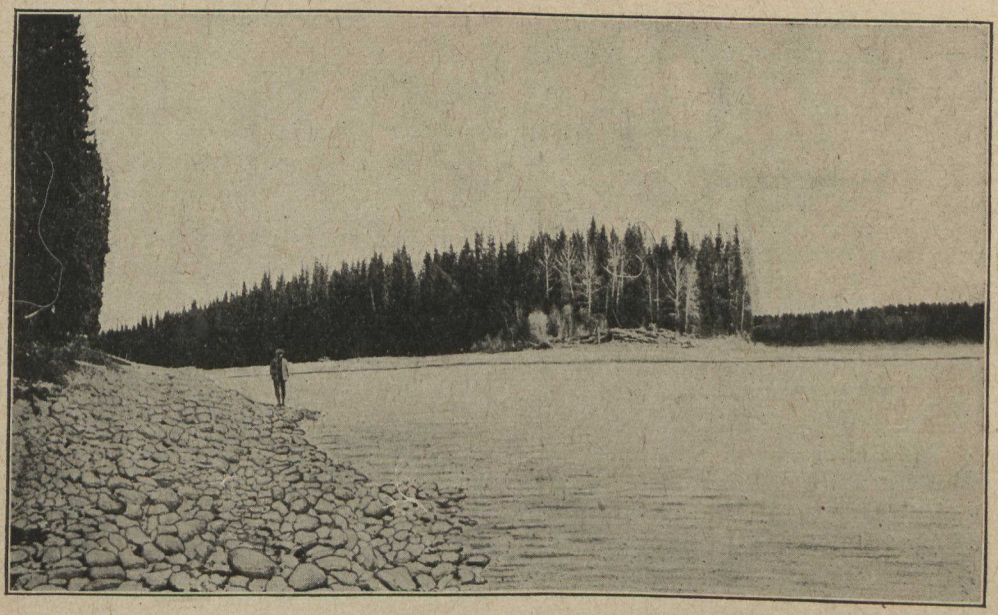
Growing New Crops.

"The conditions for reproduction are on the whole fairly good. On areas that have been burned over much depends on the area burnt and the prevailing winds and the proximity of forests capable of producing seed. As the coniferous trees do not seed each year, it is sometimes several years before any seed is scattered over burnt areas. Then sometimes a nurse crop of poplar and white birch comes up before the spruce and balsam commence to seed. I have seen several very large areas which were burnt more than fifty years ago on which there is to this day no reproduction of spruce or balsam except a few scattered trees. Then, too, the reproduction as practised by nature is very haphazard, being either too plentiful, as in the case of balsam, which often seeds in such dense stands that it has no room for proper development and the trees push up into thin, spindling poles which die early from disease, or blow down. Generally, however, the reproduction is only a small percentage of what the ground can carry and the trees grow up knotty and bushy or are crowded out by less valuable species.

Choking the Soft Woods.

"In regard to reproduction on cut over areas, cutting, as is done under the present system of arbitrary diameter limit, is practically using a selection system which favors the species which are at present unmerchantable, as the hardwoods. By cutting out the coniferous trees, the hardwoods are given less competition and their growth favored and the opening up of the stand allows them to seed in and their rapid growth seedlings choke out the softwood production.

"Then, too, the forests are subject to many hazards, the chief being fire, the second insects and fungi, and the third wind. Fire has in the past swept over more than a third of the St. Maurice Valley, and a few large fires would very seriously reduce the amount of



TIMBERED ISLAND ON ATHABASCA RIVER AT MOUTH OF PASS CREEK, ALBERTA.

our future supply. On areas which have been lumbered, and the tops and branches are allowed to remain and rot on the ground, the most favorable conditions are presented for the growth of fungi and for the increase of insects which attack the standing timber. Then, too, where the stands, especially of balsam, are too thick, the trees are weakened and easily diseased. There are districts where practically every balsam tree is defective.

Loss in Winter Logging.

"The methods of exploitation are the same as when the country was first lumbered. Up to 1908 no changes were made in methods. Naturally in cutting timber, one takes the most accessible timber and that which can be cut and transported at the least cost, so that the first lumbering was done along the river banks and around the borders of lakes, and only the largest and best trees were taken. Up to 1908, not more than twelve per cent. of balsam was taken by the companies manufacturing pulp, now practically no discrimination is practised between balsam and spruce in cutting. The result of this method of cutting is that areas have had to be logged over many times in order to get all the available timber; sections which were rocky or difficult to approach were not cut and timber distant from the waterways was left. Now the hauls have materially increased, with an increase in logging expenses, and in other places the amount of timber is too scanty to go back for, and sections unlogged are often so difficult of access as to make the getting out of the timber impossible at a profit. Logging is done in the winter, which adds much to its difficulty and expense, and is responsible for many wastes, such as high stumps, logs lost in the snow, and slower work.

"The most obvious wastes under the present system of logging are high stumps, usable wood left in the tops, the use of spruce and balsam in building camps, when white birch and poplar can in most cases be used, the use of merchantable wood for roads. There is a lack of proper inspection of the operations, nearly all the operators letting out contracts for the cutting of their timber, without adequate supervision of the operations. Some of the companies have developed good inspection systems.

Fire Protection First.

"The following improvements are obvious:

"First, a good system of fire protection for the province outside of the St. Maurice and Lower Ottawa valleys. In these two sections co-operative Fire Protective Associations are in existence which practically eliminated the fire hazard, showing what can be done. In other sections the Government should force the limit holders to properly protect their holdings; this can be done at small expense, one-quarter of one per cent. per acre per annum. In order to do this the Government must have properly qualified men to act as inspectors and must have *enough* of them, and it must protect the areas which are not yet under license. Under the Hon. Mr. Jules Allard, Minister of Lands and Forests, great progress has been made, and he has shown the greatest desire to properly protect and administer the great public domain under his charge. His Department has been one of the most important in producing revenue, and sufficient money has not been allowed him to properly take care of his Department. In order to safeguard the future revenue, more money must be spent annually now.

Change Fixed Diameter.

"The present law which compels cutting to a fixed diameter limit should be repealed and the cutting should be done directly under the inspection of properly trained and qualified inspectors who should be competent to designate the trees to be cut. This of course would mean a large increase in current expenses, but as it must come sooner or later it is better to spend the money before the damage is irreparable.

"Logging should be commenced much earlier in the season and should be finished by the time the snow comes permanently. Camps should be built out of birch and poplar.

"Some system of brush disposal should be compulsory, both in the interest of fire protection and the good of the forest.

"Burnt areas which are not restocking fully should be planted up and everything possible should be done to make it possible and advantageous for limit holders to replace the trees cut by planting.

"The Laurentide Company, Ltd., the Pejepscot Paper Co., and the Riordon Paper Co., Ltd., have begun to plant, and have shown that it is feasible.

"The work of logging and other woods operations should be done by men who have been trained properly in these operations. This work is a sort of engineering, demanding technical knowledge and good judgment, and is too often left to men who are totally ignorant and incompetent. Few operators have any idea of what is going on in the woods, and as long as they have cheap logs delivered to them, are satisfied to leave matters as they are. It takes a long while to grow timber or to repair the damage done by careless handling, and we are too prone to leave the problems of supplying raw material for the future to the men of that day, forgetting that it is we who must lay the foundation."

Quebec Forest Revenue.

According to the report of the Quebec Lands and Forests Department just issued, the total revenue for the year was $1,807,259. Receipts from sales and areas amount to the sum of $75,703.59, while the sale of Crown lands. hydraulic powers, etc., produced the sum of $28,353.81, with expenses for the service amounting to $2,219.50. Revenue from woods and forests amounted to $1,683,682.23, as follows: Ground rent, $352,380.26; stumpage dues, $1,221,683.82; penalties and fines, $24,255.17; accrued interest, $33,826.85; transfers, $10,720; premiums, $40,816.13. An area of 339,725 acres was subdivided during the year, and 103,658 acres reverted to the Crown. There is at the disposal of the Government at present 7,465,637 acres.

A Large Enlistment.

Since the outbreak of the war no less than one hundred and eighty men employed in the plants of the Provincial Paper Mills Co. have enlisted for overseas. This number constitutes about thirty per cent. of the working forces of the company, which is a splendid record.

On the Field of Honor.

We regret to report the death at the front of another student of the Forest School of Toronto University—Second Lieut. James Douglas Aiken, attached to the Royal Field Artillery of the British Army. Mr. Aiken's home was in London, Ontario, where he obtained his primary education, going up to Toronto for the teachnical course at the Forest School, which he completed last January. He was a member of the C. O. T. C., and one of the first draft of 41 officers chosen to receive commissions in the British Army. He had been on the Somme front since March, and was personally congratulated by the General of his division on Easter Monday

Mr. Aiken worked for two summers for the Dominion Forestry Branch, during the summer of 1914 being engaged as student assistant on traverse surveys in the Rocky Mountains Forest Reserve, and in the summer of 1915 in charge of a survey in Eastern Manitoba.

Sawdust Cement for Floors.

In answer to a letter written to the Forest Products Laboratory at Madison, Wis., with a view of ascertaining for an Australian correspondent a formula for a sawdust-cement composition for sawmill floors and other purposes, The Timberman, of Portland, Ore., is in receipt of the following reply:

"Madison, Wis., Sept. 26, 1916.

"The Timberman: There are a number of different kinds of sawdust and cement compositions used in the manufacture of flooring for offices, mills, barns, etc. We took this matter up rather recently with one of the other government bureaus which was interested in the subject, and also with the Portland Cement Association. It appears that entirely satisfactory floors composed of cement and sawdust have been laid and are at present in service. On the other hand, the cement association, judging from the tone of the correspondence which we have had with it, does not believe that sawdust and cement mixture are practical materials for floors."

Repulping Paper.

An American inventor has discovered a means of utilizing a waste digester liquor for removing ink and color from waste news and without discoloring the fibre, so that the paper may be repulped. "I have discovered," he says, 'that by subjecting waste print paper, either in a pulped state or in the whole, to the action of spent digester liquors, under any temperature, for the space of one hour or more, then washing the pulp with fresh water, all ink or coloring matter that may be in the paper will be entirely removed, and without discoloring the fibres of the mechanical wood pulp, leaving the same fit to be re-made into white paper. If the waste paper be first pulped, it may be charged into a beater vat filled with either of these spent digester liquors, and by the action of the beating engine all ink or coloring matter will be entirely freed from the pulp. The solvent may then be drained off and the pulp washed in fresh water, leaving the same in a state to be re-made into white paper."

GROWTH OF N. Y. STATE FORESTRY ASSOCIATION.

The Executive Committee of the New York State Forestry Association has announced that Mr. Victor A. Beede, Assistant State Forester of New Hampshire, will be the permanent Executive Secretary with headquarters at the Syracuse Chamber of Commerce, Syracuse, N.Y.

Mr. Beede is a graduate of Yale University, the Yale Forest School, and before entering the U. S. Forest Service studied forest conditions in Germany, France and Switzerland.

With a Secretary to give his entire time to editing the magazine, increasing the membership and the general activities of the Association, a most successful year is anticipated. Mr. Beede possesses qualifications of a high order, and will undoubtedly build up a strong association in New York State.

Paper Prices and Forest Fires

Independent of other causes operating to increase the price of paper to Canadian publishers, the constant destruction of spruce and balsam forests by preventible fires has played a serious rôle. Without question, there is abundance of woods to meet all demands of paper mills, but abundance and accessibility are frequently two very different things. Transportation distance between the woods and the mills is a factor of first importance, as not a few unsuccessful Canadian and American paper mills have been forced to realize. Every additional mile a paper mill is obliged to travel for logs, the costs of the paper product will reflect an advance.

E. H. Backus, President of the Minnesota and Ontario Paper Company, at Fort Frances, Ont., stated recently to Western Canadian publishers that the increasing inaccessibility of pulp limits from the mills is making paper dearer.

Replying to a specific question on this point, Mr. Backus wrote the Canadian Forestry Association as follows: "It is true that I have recently stated that year by year the inaccessibility of the pulpwood supply is increasing. The mills have been cutting their most accessible timber first. Forest fires are continually making large inroads on pulpwood. This situation is a most natural one, and will bring higher pulpwood costs as time goes on."

Unlike small saw mills, the permanently located pulp mill cannot pack up its equipment and follow the retreating forest. Some Canadian corporations have come to see, however, that with care in operating limits, thorough protection against fire, coupled with planting on cut-over lands, pulpwood forests can be perpetuated indefinitely; accessibility of supplies need be lessened but little.

Up to the present stage in Canada the lack of modern fire protection, for which the Governments, as trustees of the timber resources, are chiefly responsible, has reduced the near-at-hand bodies of pulpwood more than the actual cut of logs. The fires of last summer in Ontario and Quebec are an illustration of this fact. The forest fire record in Ontario and Quebec during the past twenty years accounts for vastly more of the accessible forest wealth than has passed into lumber and pulp.

Without question, causes other than unheeded fires are at the root of the paper price advances in war time, but it remains true that since the first paper factory in Canada began to operate, the fire fiend has been laying his tax on the paper consumer.

Who Am I?

I am more powerful than the combined armies of the world.

I have destroyed more men than all the wars of the world.

I am more deadly than bullets, and I have wrecked more homes than the mightiest of siege guns.

I steal in the United States alone, over $300,000,000 each year.

I spare no one, and I find my victims among rich and poor alike; the young and old; the strong and weak; widows and orphans know me.

I loom up to such proportions that I cast my shadow over every field of labor from the turning of the grindstone to the moving of every railway train.

I massacre thousands upon thousands of wage earners in a year.

I lurk in unseen places, and do most of my work silently. You are warned against me, but you heed not.

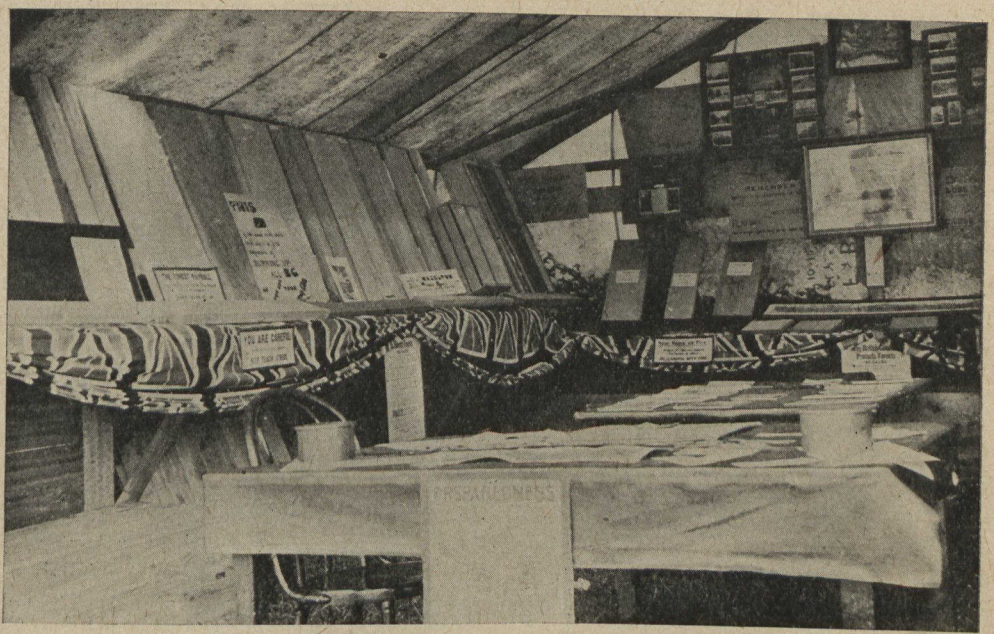
I am relentless, I am everywhere; in the home, on the streets, in the factory, at railway crossings, and on the sea.

I bring sickness, degradation and death, and yet few seek to avoid me.

I destroy, crush or maim; I give nothing, but take all.

I am your worst enemy.

I AM CARELESSNESS.



The enterprise of the British Columbia Forest Service is seen in this well-equipped exhibition tent placed in a prominent position at the Hazelton Fair.

The town of Hazelton, in northern British Columbia, on the line of the G. T. P., this year held its first agricultural fair, some five or six hundred exhibits being entered. Advantage of this event was taken by the local forest service officers to prepare and display in a separate tent, known as the Forestry Tent, an exhibit consisting on the one hand of many forms of forest protection posters, with photographs ,diagrams and other educative devices, and on the other of a comprehensive selection of forest products, some of which were supplied by the local mills, the whole being embellished with the aid of foliage and bunting.

The exhibit was undertaken to show the relation between conservation and production, and judging by the interest shown, as well as by the variety of questions asked of the officers of the forest service in charge, it went far to achieve its object.

The increasing regard for forest protection is becoming more and more pronounced in British Columbia each year, and the public are realizing to a greater extent than ever their interest in adequate fire protection and the proper management and utilization of the forests.

Circassian After the War.

The European war has not only limited the importation of Circassian walnut but has absolutely kept it out of this market—there is no Circassian walnut.

A great many manufacturers of furniture, and consumers as well, have wondered not a little what will be the ultimate result. Will Circassian walnut regain its popularity? In the minds of many this wood while beautiful in itself is not particularly fitted for furniture but more particularly adapted for the paneling in public buildings where large spaces are to be filled. But few of the manufacturers of the high grades of furniture have used Circassian walnut except to a limited extent, simply because of its unusually large figure, as they do not feel it meets the high tests of good taste.

In discussing the situation with manufacturers of medium priced furniture and the manufacturers of veneers it is apparent that after peace has been declared and there is again Circassian walnut it will not only occupy the position it did before the war, but will be more popular than ever, that is in the medium priced grades of furniture.

Indian Department Requires Lumbermen to Clear Up Debris

New Order Will Have Wide Application—Operators Allowed Compensation of Forty Cents per Thousand Feet.

A move of far-reaching importance has been made by the Department of Indian Affairs, acting on the recommendation of Mr. H. J. Bury, Chief Timber Inspector.

Hereafter, all timber sales on Indian Lands throughout the Dominion will be subject to a clause requiring thorough brush disposal. This introduces the brush disposal principle into lumbering operations on a very large area of Canadian forest lands, over one million acres in the Province of Ontario alone.

The new regulation comes into immediate operation, and applies to old licenses as well as to any that may be issued in the future. It is presumed that lumbermen when tendering for timber to be taken out under this new regulation will doubtless add the cost of this work of brush disposal to the estimated cost of their logging operation and will tender accordingly. In these circumstances the bonus offered will be slightly lower than formerly, but the added advantage of lessening the fire risk will more than offset this slight reduction.

No hard and fast rule as to the method of brush disposal to be followed will be adopted, as it is obviously impossible to have a uniform regulation which shall be applicable to all classes of timber. In a general manner, piling and burning will be followed in coniferous stands, whilst lopping and scattering will be the rule in hardwood timber. These two chief methods will again be subject to variation according to the local conditions.

The Indians take out large quantities of timber annually under permit, and every encouragement is being given to them to conform to the new regulation, both by personal advice and by the offer of a refund of a portion of the dues collected to offset the cost of effective disposal.

As trustees of the Indian population of Canada, the Department took action in the matter so as to reduce the extravagant and unnecessary devastation by fire which inevitably followed woods operations on Indian lands. The revenues from timber sales are turned into a common fund for the benefit of the Indians of the reservation, no part of the expenses of the administration being deducted therefrom. Preservation of the Indian timber will doubtless be assisted greatly by the action of the Department, and what is equally important, the experience after a year or two will afford valuable data on which an extension of the brush disposal system to all Crown Lands might be determined. At present, with a few exceptions, the most that is accomplished by licensees in this regard is the clearing of debris about camps and buildings, and, in a few instances, the removal of inflammable material from the neighborhood of trails along driving streams.

Too often the mention of brush disposal conveys to the imagination of lumber companies a sweeping order to clear away all logging debris over many square miles. This is not the way in which the practice of brush disposal will get its start in Eastern Canada. If a few companies could be persuaded to burn the slash along their

roadways, around their camps, and along some of the most used trails, it would go a long way toward bringing down the fire hazard. Experience indicates that this can be done at a cost which is very small when compared with the probable reduction in timber losses. A Minnesota lumberman, one of the biggest operators in the Middle States, objected very strongly to the imposition of a state requirement of brush disposal, but after one or two years' trial he so endorsed the idea that he voluntarily applied it to all his privately-owned limits.

The Editor of the Journal discussed with the heads of several lumber and pulp companies the question of making a beginning in clearing up dangerous debris. In all cases the companies had had orders in effect for some years requiring a Spring clearance about camps, and in one case a good deal had been done to remove inflammable material from along the edges of driving streams. As in the question of fire protection, however, the companies hesitate to inaugurate at their own expense improvements such as partial brush disposal when neighboring licensees follow no such programme. Were the provinces to insist upon brush disposal along roadways, etc., in a limited and reasonable degree, there does not seem much likelihood that the willing co-operation of lumber companies would be long delayed.

The Dominion Forestry Branch applies a brush disposal clause in all operations on the Reserves, and the Canadian Pacific Railway in its private timber lands of the West has done a good deal in the same direction. The C. P. R. Forestry Department does not dispose of all the slash, but the worst hazards are burned. Thus, in heavy growths of spruce along the streams, where the roads necessarily run, the completion of logging witnesses the burning of all the debris left lying along the river and the roadside. The river and road act as good fire guards during the burning operations.

Slash Law in Massachusetts.

The Slash Law in Massachusetts requires that all brush cut within the limits of public highways must be disposed of, and anyone cutting timber adjoining the public road, railroads or other woodland property, must clear free from slash a strip forty feet wide along such highways, railroads and other woodland property. This law has met with public approval from the start. The State Forest Act created a State Forest Commission. This Commission has already purchased 8,000 acres for State Forests and 4,000 acres more are soon to be taken over. Vermont, New Hampshire and Connecticut also have State Forests, but all of the State Forests of New England combined would be lost in one of the big State Forests in Pennsylvania.

While it is admittedly better for a State itself to own its large woodland areas, there are cases where it is advisable for the Federal Government to take them in charge. Such was the situation in New Hampshire, where a comparatively poor State contained such an extensive area as the White Mountain region, the protection of which meant so much to the adjoining States. The whole of New England has felt the wisdom of the policy which the Weeks law has put into effect. To-day the Government owns in New Hampshire over 300,000 acres which will always be managed as National Forests. By the time the Government completes its purchases, we shall have probably twice that area, which will always be held open to the public and in trust for future generations.—"Forest Leaves."

The farm woodlots of the United States contain about 10 per cent. of the total standing timber in the country, and the annual product from them is about $195,000,000.

One million three hundred ninety-six thousand acres have now been purchased for national forest purposes under the "Weeks Law" in the White Mountain and Appalachian regions.

A portion of the half million dollars' worth of French briar imported annually by the United States for the manufacture of pipes will now be replaced by the use of mountain laurel roots from the Southern Appalachians.

Finding Fires With Aeroplanes

Practical Information by an Aviator, Who Describes Advantages and Costs of an Air Patrol

By

W. E. Boeing,

President, North-west Aero Club.

[In view of the great interest taken throughout Canada in the possible employment of the aeroplane in forest fire detection, the Journal reproduces a most interesting paper read by W. E. Boeing, President of the Northwest Aero Club, before the Logging Congress of the Western Forestry and Conservation Association at Portland, Oregon, a few weeks ago. There are included, also, the questions which were put to Mr. Boeing and the answers he gave.—Editor.]

"We will now take up the question of the feasibility of the aeroplane in connection with forest fire patrol. Under clear weather conditions the origin of smoke is very easily detected, in fact smoke emanating from a chimney or bonfire often serves the pilot in determining the direction of the wind near the surface on which he is going to land, as it is good practice only to land coming into the wind. The presence of a minute amount of smoke is readily discernible from the higher altitudes, as it is one of the most conspicuous objects against the land which presents itself to the aviator when at a considerable altitude.

"In corresponding with the State Conservation Commission of Wisconsin, to ascertain the results obtained by L. A. Vilas, who volunteered his services and his machine for aeroplane patrol purposes in 1915, Mr. Moody, a member of the commission, in reply enclosed copy of some notes which he read before the Forest Fire Conference at Boston last winter, which are of considerable interest. They are in part as follows:

Can See Sixty Miles.

"'At an elevation of 1500 feet on a clear day, a fire 60 miles away in any direction is visible to the naked eye. It is not a case of finding the fire, but to locate it correctly is the job. Smoke will show up very plainly from the air. Mr. Vilas reports that during a flight across Lake Michigan from St. Joseph to Chicago, he was completely out of sight of land or anything for that matter for over three-quarters of an hour at an altitude of 4,600 feet. The first thing that he saw was the smoke from the Chicago rolling mills. This was in sight over ten minutes before any shore line was visible at all. People often ask what a country looks like from the air. It is difficult to describe it except that it looks like a large painted map on a small scale without section lines. The efficiency of an aeroplane in spotting a forest fire is without doubt as practicable as any use to which it could be put. I was very much surprised with what ease a fire could be spotted and located, and there is no question in my mind but what the aeroplane will practically do away with some of the observation towers.

"'The use of the aeroplane in the European war in the way of spotting and locating gun fire, armies of men, supply trains, etc., is well known; all of which objects show up comparatively small in comparison with forest fires.'

"The observations of Mr. Vilas are most interesting coming from the only one who has actually undertaken work of this character.

Study Maps First.

"A pilot can familiarize himself very readily with the country which he has to patrol. A careful study of maps before making his first flight will give him a very good working idea of the country which he is to cover. After seeing the land from the air he should be thoroughly familiar with it, provided he has sufficiently studied his maps.

"The more conspicuous objects which are used from on high to determine location, are railroad lines, highways, streams and lakes. These are all shown on the maps and are very conspicuous from the air. As he becomes more familiar with his surroundings, building or groups of buildings and clearings, after they have turned brown during the late summer and early fall months, will also serve in determining location. It may be interesting to add that hills and mountains from the greater altitudes flatten out and look like level country, likewise it is sometimes impossible to distinguish between forests and pastures. The aeroplane used for fire detection or fire spotting would be of considerable value in being able to penetrate by observation distant sections of the country which are sparsely inhabited and difficult of access, and where the chief menace probably comes from campers.

Wireless of Small Value.

"The use of the wireless has been suggested, but is not to be advised; it would only tend to add weight, complicate paraphernalia and require someone skilled in its operation. Owing to the speed at which an aeroplane travels and the resulting small amount of time required to return to a base to report, nothing would be gained by such an installation and would have no value in this particular connection.

"It is somewhat difficult to estimate the cost of an aeroplane patrol service, however the following figures will throw some light on the subject: The initial outlay for each machine required in this service would be in the neighborhood of $8,000 to $10,000. In addition it would be necessary to provide housing and appliances for the maintenance at the station from which the machines would be operated. The building and appliances could probably be installed at from $500 to $1,500. Depending upon their character and permanence. As the work done in this connection would be during the summer months, temporary housing of canvas might be sufficient, which would very materially reduce the expense. It would be advisable to maintain two machines from each base in order that there would be no interruption of the service. The approximate monthly expense of maintaining a station would be as follows:

Salary of aviator	$200
Wages two mechanics $100 each	200
Gasoline, 15 gals. per day, 30 days,	90
Oil approximately 1 gal. per day	15
Miscellaneous supplies $20 and upwards	20
Total	$525

"The above fuel and oil cost is based on two hours flight per day, or an average distance of 140 miles. Possible breakage to the equipment would also have to be considered."

Discussion.

Q. How would the roughness of our territory affect the proposition? As I understand it, one would not circulate aimlessly looking for fire, but make a fairly straight course high enough to see in all directions.

A. At a mile high a man could glide five or six miles, thus could reach one of two landings 12 miles apart.

Q. Would that be too high for locating fires?

A. No, about right. And he would want to be at least 3,000 feet on account of topography.

Q. How about mountain air currents?

A. We generally figure the air affected by obstacles on a plant surface to a height 2½ times the obstruction, but it would be nothing like that with mountains. I think by keeping abreast of the higher peaks there would be no trouble.

Q. A mountain lookout sees through a smoke blanket obliquely. Could an aviator, by looking straight down, penetrate smoke that would trouble our lookouts? If so, perhaps we could

solve the weakness of the lookout system of detecting fires?

A. I have not had experience in smoke, but this is true of fog. Often when it seems very dense on the ground we can see through it from above.

Q. How fast must a machine travel to keep up.

A. It depends on the type; probably fifty miles an hour.

Q. What is the rate of depreciation on machines?

A. Possibly more than on Fords.

Q. Could a man go up every day for two months with reasonable assurance against breakdown or accident?

A. Oh, yes. The modern machine is about as safe as an automobile or boat unless you try to do something spectacular.

Q. How large an opening in the woods is required for landing?

A. Very few acres would do to land in, for you can spiral in coming down. It takes more room to get up again.

Q. How long would it take to get down and report after finding a fire?

A. Figure it 75 miles an hour to the reporting place.

Q. How closely could you identify the location of a fire?

A. I think the aviator would soon learn his country well enough to locate closely by reference to known landmarks. Topography appears flattened out to an aviator. He does not work by reference to hills and valleys like a man on the ground, but by having every other feature but these very much more evident than to the man on the ground. It is more like looking at a map. Buildings, roads, streams and openings are conspicuous, and their position with relation to each other is clear.

Q. How would you communicate when you found a fire; drop a message at a telephone point, or stop?

A. Both are practicable, but I should say best stop. Remember you wouldn't need a telephone at all landing places because it don't take long to fly 30 or 40 miles.

Q. Are electrical storms, such as cause many fires, dangerous to flyers?

A. They would not interfere at all.

Q. It still strikes me that this would be only an intermittent service. With the fixed lookout you can report immediately by telephone; you can probably get two bearings on the same fire and locate it accurately; you are there to get new fires as in the case of an electrical storm when I have known 19 to start one after another; and you are there all the time. The aeroplane begins to lose valuable time as soon as it finds the first fire. And as to the smoke obstacle, I think it has been exaggerated.

A. The point is that none proposes to replace the lookout system. The thought is that every protective unit may have an aeroplane as an auxiliary; not used at high expense when lookouts are adequate, but to help keep in touch with the situation in bad times when the whole system is overtaxed—when men on the ground are overworked, when lookouts cannot see, when the whole system is breaking down and we feel helpless. That is when fires cost money and when any help pays, even at high expense.

Fireproof Paper.

An English patent has been taken out by T. J. I. Craig and others, of Manchester, on a method of fireproofing paper. According to an abstract in Journal of the Society of Chemical Industry, in the process of rendering materials non-inflammable by means of sodium aluminum carbonate, these materials in which the proofing agent cannot conveniently be precipitated in situ, may be treated by mixing or coating with a preparation of the double carbonate.

What Is Sulphite?

Almost everybody in the printing and allied trades can answer this question, but for the benefit of readers who are not quite certain over the matter it may be explained that sulphite pulp is obtained by a chemical process in which acid is used. The wood cells are separated from the other constituents and formed into cellulose, as it is known in trade, sulphite, pulp. When the same process is conducted with an alkali the product is known as soda pulp.—Printer and Publisher.

A Forest Service That Booms Business

How British Columbia's Organization Seeks New Markets as Shortest Road to Successful Conservation

By M. A. Grainger,

Acting Chief Forester of British Columbia.

(From an Address Delivered Before the Rotary Club, Victoria, Nov. 16, 1916.)

When we started the Forest Service in British Columbia many good people, and especially lumbermen and business men connected with the industry, shook their heads very doubtfully. "The logging and sawmill industries of the Province are business propositions," they said, "commercial propositions, which can only be carried on by business men in a practical business way." That was five years ago, and since then we have carried on some forestry in British Columbia, and I think people generally have a better notion of what forestry. I'll tell you some of the forms forestry has taken here.

Take selling lumber; that is forestry. Go through these enormous timberlands of ours and size up the situation. What do you find? You find this: four-fifths of the annual growth, four-fifths of the annual forest income, that Nature asks us every year to turn into dollars, is wasted. We don't use it; we take our mere 30 million dollars from the woods and leave the other four-fifths of one's lumbering prosperity behind. Why? Just because the markets for British Columbia lumber are insufficient. What is the remedy? Obviously, bigger markets and more of them. Get these markets and this appalling waste of raw material will be stopped. Market extension means true forest conservation; and that is one reason why increasing the markets for British Columbia lumber is true forestry and why the forest servoce carries on its market work, co-operating with our lumbermen in every way it can. You are familiar enough with the methods we employ. They are the usual publicity methods, advertisements in papers and periodicals, exhibits, and all that sort of thing. But the essential part of the work is the punch it possesses, and the punch is delivered by active, persistent, skilful, personal work by the man on the job.

Substitutes and Advertising.

You must know 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 already have. Where would the province be if any serious proportion of its existing lumber business were wiped out? It could not happen, you will say; people have got to buy lumber; it is a staple article like wheat. Well, they have been carrying on a searching investigation into the lumber trade of the United States, and this is what they have 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 we have adopted in this business forestry, or forestry business, of ours. Many a sale of British Col-

umbia lumber has been made this year to prairie farmers who have been supplied by us 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 co-operate with our lumbermen and get all the best selling methods carried out in this community effort to increase the sale of British Columbia lumber.

Profits of Advertising.

Now take another side of forestry—the protection of standing timber. Lots of people think this just means fighting forest fires, but that is not the point at all. Forest protection means two distinct things. Firstly, it means educating public opinion. Just as a breakfast food company keeps banging away with advertisements, so it is the business of the forester to educate public opinion to be careful with fire in the woods. People used to think it was a "josh"; these scare-head posters on country roads, these articles in newspapers, these paper cups for campers with "be careful with fire" stamped on them; these pocket whetstones we have given away to lumberjacks and pre-emptors and all sorts of men who work or camp in the woods. But this publicity campaign has proved itself; people are becoming more careful every year, we notice our fires are caught sooner and cost us less money on an average; the whole cost of all the publicity work responsible for this change has not amounted to the expenditure you may have to make in fighting a single serious fire.

Brains in the Forest Service.

Now this work of education is carried on to prevent fires from ever starting, as far as possible. The second part of forest protection is simply this: good organization, supervision; the training of the man on the job to use good judgment in handling fires when they start. Good judgment is the one thing needed. There is no line of work in which it is so fatally easy to waste large sums of money as in fighting forest fires. It is emergency work, it needs cool judgment and experience. You can easily waste more money on some fire fighting effort than what you save is worth. But mark one thing: you have to realize what is worth saving. I remember an official report of an Eastern Canadian Government once congratulated the country because the bad fires of the year had done no damage, "only young growth being destroyed," as the report said. Now that is absurd; if you are going to adopt a general principle of letting the young growth burn, good night to the lumbering industry of British Columbia before this century is over! But let me repeat again, forestry means the putting of such matters as the fighting of forest fires on a business basis.

Take another line—the stock taking of forest resources. A fancy line you will say; sort of collecting data and masses of useless information and writing volumes of reports that no one reads. Now we have done a little stock taking in the last five years, but it is not of that description. It has been done mostly for the simplest, immediate business reasons. Our men have gone into various forest districts and roughly mapped the places where the good timber is. We have not done it all over the province, for lack of men, an dtime and money. But this rough mapping of valuable timberlands protects them from alienation, shows where timber sales can be made, and helps in the arranging of fire prevention work. It is a side of business forestry.

Bracing Up the Treasury.

Now come to forestry as a money maker for the public treasury, something that makes your taxes far lighter than they would be otherwise; one-third of every public dollar, two to two-and-a-half million dollars of yearly revenue already, and going to be a good deal more than that. That revenue has to be worked for, it will not keep coming of itself; and so forestry here in British Columbia means an organized forest service with an annual turnover about equal to the three largest of our lumber manufacturing concerns combined. It means a considerable business in valuing and selling timber; it means inspecting logging operations to prevent trespass; it

means making sure that cut timber pays the proper dues.

The tourist at a logging camp just sees a boom of logs. Our rangers see material that the Crown is selling, something on which any one of twenty different sums of money should be collected. He has to see that these logs are clearly marked so as to show which of these twenty different amounts—ranging from one cent to two or three dollars a thousand feet—must be paid on these logs.

I have touched on four aspects of forestry in British Columbia:

Forestry as selling British Columbia lumber.

Forestry as forest protection.

Forestry as stock taking of timber resources.

And Forestry as collecting money.

Too utilitarian, you may say. How about posterity; how about taking long views to safeguard the future; how about the development of a permanent forest policy? Do not mistake my meaning—these things must never be forgotten by any public service engaged in forest management. Forestry, in the broad conception, is merely a great form of agriculture; the harvesting of Nature's successive timber crops; and we in the West, in our business of harvesting the present enormous crop, must not neglect to safeguard, in every practicable way we can, the next crop that is now growing.

Forest School Needed.

Trained men are needed in the work of forestry. What means of training does British Columbia provide? Do you know that almost every Western State deals with this question. Oregon has a forest school, California has a forest school; so has Washington, Idaho, Montana and Colerado. Logging engineering is being taught as a profession, just like civil engineering. Do you know that British Columbia provides no training whatever, though forest industries are our most important ones? Our young men must go and study at Seattle or (if they have the money) they must go back East. With all its various professional equipment the University of British Columbia has no forest school.

And again, the foreign buyer of British Columbia lumber, the city engineer back east; architects the world over ask us, when we try to push the sale of British Columbia lumber—how strong is it, what are its qualities; what engineering tests have been made of it? And we must answer: None! and lose the business. All we can do is to distribute hand books for engineers published by our go-ahead American competitors—like the West Coast Lumbermen's Association at Seattle. It is not good business when a firm has to send its competitors' price lists to its customers because it hasn't any of its own in print. But that is the fix we are in in selling British Columbia lumber. I think you will agree that we need a timber testing laboratory at the Provincial University.

China's Possibilities.

Capt. Robert Dollar, of San Francisco, in a recent address before the Vancouver, B.C., Rotary Club, stated:

"The Russian trade is an unknown quantity just at the present time. The Russians will likely have but the one port of Vladivostok to offer as the only certain port, and that might be shut at any time the Russians so wished. It is to China that you must look for your future trade, and I desire to emphasize this fact right now that China will be your mainstay in the future in foreign trade relations just as soon as the Chinaman learns his own purchasing power. "China has only been scratched for trade," he said, "and when you stop to consider that one-fourth of the population of the world is living there, an immense population which is awakening to civilization as we see it, then you may be able to grasp the immensity of the situation. The day is coming when the Yang Tse Kiang valley will be the greatest steel-producing section of the entire world."

(Courtesy Grand Trunk Railway.)
LADY EVELYN FALLS, TEMAGAMI, ONT.

The Partnership of Farm and Forest

The Old and the New View Points of the Relationship of Timber Crops to Agriculture

By Robson Black.
(Article runs concurrently in "The Farmer's Advocate.")

The Farm and the Forest were born twins, with equal rights in the great Canadian Estate, and not the slightest reason or desire to live in disagreement. What farmer begrudges the service rendered by the silver and coal and nickel mines, or the fisheries on either seaboard? This is indeed a land of many businesses, in which any developer of a natural source of wealth, be it the land, the mines, the fisheries, the forests, is playing benefactor to his generation. We are poor stewards, indeed, if we cannot extract from each of the natural gifts of Providence the maximum wealth and service, without trying to change agreeable servants into quarrelsome rivals.

I have emphasized the identity of interest as between farm and forest for a good reason. The older days of Canada bred a notion in the minds of men and women that tree life was a cumberer of the ground, that forest fires were a blessing in clearing lands, that the lumberman was a "predatory" creature, appropriating some easy money without much effort, and that Canada owned so much timber that nothing could reduce our super-plenty. The Forest, of course, had no spokesman. Where agricultural experts by

the hundred flourished and preached the common sense claims of Agriculture, not a single forestry expert put in an appearance in Canada until a comparatively few years ago. Any public representation of the quantity of our remaining forests, the innocence of forest fires, and careless lumbering was accepted at face value, for there was none to argue against it. The Forest has been our most shabbily-treated national resource. Demanding quite as much scientific management as Husbandry in order to produce highest dividends it has been treated in the past like a crop of front-lawn dandelions that deserve extermination. Had the growing of forests been looked upon as an ally of agriculture, which it most truly is, we would have applied our brains to it twenty years ago as to crop rotation and pure bred stock.

Putting All Lands to Work.

Crops are crops, whether trees or wheat. There may be a conflict of opinion as to placing oats or wheat on a certain acre in a certain latitude. But there never can be much conflict about the tree crop. It grows on all soils, but is content to grow where cereals would wither. The true conservator, therefore, regards forest crops in this manner: give to the farmer for field crops every acre in the Dominion on which such things will flourish. But about fifty to sixty per cent. of the whole area of Canada is not fit for field crops and will not pay the plowman his salt. Shall we leave that sixty per cent. as desert or put it to work? By all means put it to work—the only work it will do—growing timber.

A good illustration comes to hand from New Brunswick. The Government of that province is carrying out what amounts to a double survey of the whole provincial area now under forest growth. Rather than locate new settlers ignorantly, the authorities will be able to put their hand on nearly every square mile of agricultural soil and know positively that it will bear crops and is worth opening up. They will also possess detailed information as to every acre that will grow nothing but timber and can intelligently mark off such lands from any chance of settlement. Thus, at a stroke, the future agricultural development of New Brunswick is given an important safeguard, the revenues from timber lands are assured, and there need never be enacted the tragedies of misplaced settlement and abandoned farms. Every province of Canada should have a careful soil survey preceding settlement. Until that is done and until entire communities are transported from their present hang-dog surroundings to lands that will give them crops we cannot expect to take medals as agricultural managers.

Our Future Immigrants.

We perceive in these stirrings of Governments some recognition of the Forest's claim for scientific study and a clear-headed plan of business management and development. No farmer wants to think of a timber famine and soaring lumber bills. Neither does he invite the ruin of the great wood-using industries for lack of supplies. In both cases he will be a grievous loser. Yet our total of accessible timber is not large. We have only about one quarter what is possessed by the United States. We have burned about five times as much as we have cut. With a population of a few millions we have allowed our once splendid areas of white pine to be scourged into a remnant of timber berths. Yet, knowing these things, we beckon to Europe for ten or twenty millions of lumber-using immigrants. How shall we supply them, if we are heading for exhaustion on our present basis of population? These are questions none of us can ignore.

The farmers of North-western China took no heed of conservation necessities and to-day one may see stretches of hundreds of miles, denuded of forests and stripped of farms. The farmers of Palestine and Syria, Greece, Central Spain and parts of Italy likewise gave them no heed and were driven out by flood and drought, wind storms, plagues of insects and the scarcity of fuel and the commonest wood supplies for farm and home. In the Empire of India, the mass of people are agriculturists, but wood is so scarce that prices run to $100 a thousand feet, and the

families content themselves with mud shelters, primitive working methods and wages of a few cents a day. Wherever we go over the earth we learn that the balance of Nature cannot be disturbed without disastrous consequences. Where the forest is swept away, the farm follows.

Our Governments as Stewards.

What is the duty of the Canadian public toward their forest possessions? First, to guard them against fire. One would think that Governments, as public trustees, would have thrown an insurance policy about such indispensable possesions, but the truth is that we are only in the primer class in fire guarding. We have enough good examples, as in parts of Quebec and all of British Columbia and Nova Scotia, to show that bush fires can be put out of business and forested country rendered safe for human life and property. There is very little reliable information on forest fires of past or present, and this had hidden from the public the incredible losses they have sustained. We have shielded ourselves with the notions that forest fires were visitations of Providence and that plenty of timber remained. If any reader of this article takes comfort in the possibilities of re-planting the forests in the wake of irretrievable fire damage, it is well for him to remember that *planting forests with tiny seedlings* costs at least $12 an acre, while protecting the full grown forests of giant pine or Douglas fir against burning, costs only half a cent an acre. The forest fire is the biggest thief in Canada to-day. It seeds upon the indecision of Governments just as Governments avoid preventive action by the indecision of the easy-going voter. Any Government that wills it so can put a stop to forest fires, for we are lagging behind every decently governed country in the world in the sane employment of our forest resources.

Forest Influence on Stream Pollution

By N. R. Buller, of Pennsylvania Department of Fisheries.

The relation of the forests to the streams and stream pollution is naturally very close. Without forests we could not have beautiful streams and without beautiful streams the forests would be lacking.

Before the white man took up his residence, all th ewater in the lakes and streams was pure and undefiled, fitted for man to drink, for the cattle to quench their thirst, and for the fish to live and prosper. There is no greater chemist than Dame Nature herself, and she works with a will and earnestness that should excite the emulation of man.

When a tree fell in the forests the oxygen in the air produced to make it useful, and the carbonic acid resulting from the work of the oxygen was taken up by the growing tree alongside of the fallen one, and the carbon converted into plant life, while the oxygen was once more given off free to the air to again resume its chemical work. Similar processes were transformed so that from day to day there was an everlasting work of the chemical forces to destroy those things which have lived their lives and to build up those which were beginning their lives.

Nothing in nature is without its use. If the trees and brush along the streams and lakes, in course of time, fall into the waters they become shelters in which the small fish could hide, the microscopic animalculæ on which the little fish lived could propagate and thus subserve a useful end. There was no trash in those days when nature ruled supreme and man did not intervene his wasteful hand.

With the coming of man all these things changed. He saw only those things which he could convert instantly into value and carelessly allowed to run away everything that could not be turned into instant use without some extra course of treatment. In the mountain-side a spring of pure water gushed forth and started for its trip to the ocean with as unerring an instinct as that which inspires the tendrill of the pea vine to reach out for a support that it may climb heavenward.

The rill of water increases and grows as it pursues its way, joined by other little rills until it becomes a creek, and then winds out to the river. In the clear, cold spring water nature planted our brook trout, which you are all familiar with, if you have ever tried your hand at trying to land him. As the stream grew wider, the water warmed under the sun's rays and the trout refused longer to dwell in the waters which enervated him as the Turkish bath enervates its devotees. In these warmer waters nature placed the bass and salmon and the other fish which we class as food fish. You will see here the relation of the forests to the streams. The warming up of the water in most of our trout streams is due to the deforestation. When the forests are cut away the sun's rays have a grand opportunity to make the waters warm. If the banks of the streams were lined with trees, as they should be, this would not be the case.

On account of the deforestation of our mountains and hillsides, the Department of Fisheries has inaugurated the distribution of fish in the yearling stage. The fish in this stage are able to meet the conditions and take care of themselves much better than the small fry which was formerly placed in our streams. When the streams were lined and practically covered with forests there was plenty of food for the young fish, but since these have been cut away the conditions have to be met by planting larger and stronger fish.

There are, according to statistics, over forty-eight thousand industrial plants located along the streams of Pennsylvania which are running their refuse into the streams. If you stop to think of this for a minute you will realize what it means to the streams and forests. If the stream is polluted by industrial waste, it is, naturally, depleted of fish and the shrubbery is killed all along the stream, which detracts from the attractiveness of the stream as well as the forest through which it runs. The streams could be cleaned up if the Department wanted to go ahead and stop the wheels of industry, but it is not the desire to do this. It is the desire of the Department to assist the manufacturers rather than to harass them, and for this purpose a filtering apparatus is being recommended which will stop the polluting of our streams. Much good is being accomplished along this line.

Annual Meeting To Be Held January 15th

The eighteenth annual meeting of the Canadian Forestry Association will be held on Monday, January 15th, 1917, commencing at 10 a.m. Lieut.-Col. J. B. Miller, President, will occupy the chair.

While the programme has not been definitely fixed at the time this issue of the Journal goes to press, it is certain that the problem of White Pine Blister Rust now threatening the ruin of Canada's white pine possessions will occupy a leading part. The meeting will for a time resolve itself into a conference of provincial and federal authorities, the object being to determine a course of action by which speedy and thorough suppression of the disease may be attained. No subject has more importance or interest, and while the Forestry Association has been advertising the Blister Rust danger for some time past throughout Eastern Canada, in an effort to stir up public opinion as

to its dire consequences, a plan of co-operative action is immediately necessary. What part the Provincial and Federal Governments shall play in the matter should be clearly ascertained and appropriate action taken by the Association.

Another subject which, it is hoped, will have a prominent place on the programme is brush disposal. The subject is an integral of fire protection. Eastern Canada has been by no means a crusader in experimenting with the removal of logging slash, and some live testimony from practical lumbermen in Minnesota and elsewhere who have applied the brush disposal principle to commercial lumbering operations would be interesting and stimulating. Contributions to the subject from Canadian sources should prove of equal value.

Other subjects will be on the programme, a detailed announcement of which will be sent out in ample time to all members.

Grazing in the Woodlot.

The most important step to take in the care of the woodlot is to protect the trees of the future. Unless the young trees, which go to make up the undergrowth of the woodlot are protected there can be no trees to replace the mature ones as they are removed. Without trees there can of course be no woodlot.

Grazing animals are one of the greatest hindrances to the proper development of the small trees. It is almost as impractical to pasture cattle on the same piece of ground as one is attempting to grow trees as to pasture them on a piece of ground on which one was attempting to grow oats. Not only do the cattle destroy a large number of the small trees by eating the top off, but they trample them down and the sun and wind have an opportunity to act on the soil and dry it out or bake it, thereby causing the tops of the larger trees to die back. On open patches within the woodlot or where the borders are thin, young growth should be encouraged as much as possible.—B. R. Morton, Dominion Forestry Branch.

The Farm Woodlot.

(By B. P. Kirkland, University of Washington.)

The farm woodlot product of the United States as a farm crop, according to the 1909 census, was worth very nearly 200 million dollars. The real significance of this becomes clearer when compared with the value of our grain crops, only three of which reached this figure, wheat, corn, and oats.

The forest can be grown on hill sides, in gullies and on other poor land which will never be worth clearing. A profit may be made from the sale of fuel, posts, railroad ties, pulp wood, mine timber, lumber, etc., depending upon the location of the tract and size of the timber and the market demands. If both thinnings and the final crop are utilized 2½ cords or 1,000 feet B.M. per acre per annum or more may be secured. The main aim should be to produce small saw timber such as can be sawn by inexpensive portable mills right on the ground so as to furnish rough lumber for farm building.

The question now to be answered is how much area of farm forest the average farm should have. I base this quite largely on annual fuel consumption. I believe if a farm home is heated as well as good city houses, as they will be in time, it will take from 10 to 15 cords of fuel wood per annum. Since this fuel wood should be a by-product from the saw-timber forest I should say the average farm should have reserved not less than seven to ten acres of young timber for this purpose. Ten acres ought to supply all fuel, posts, poles and in the long run all saw timber needed on the average farm.'

Illustrated Lectures in French

By an arrangement recently completed between the Canadian Forestry Association and Mr. G. C. Piché, Chief of the Quebec Forest Service, a series of illustrated public lectures will be delivered in Quebec Province beginning early in the New Year and extending through February. Where advisable, bi-lingual addresses will be given, but in communities where French-speaking citizens predominate a French lecturer will be exclusively employed. The Canadian Forestry Association will manage the undertaking, supplying stereopticon and equipment, advertising matter, etc., without cost to local authorities.

The first lectures will be held at Windsor, Stoke Centre, St. Camille, and St. George, in the Eastern Townships, and other dates will be arranged so as to reach the greatest number of people and at centres which promise best results. Suggestions as to other localities, dates, etc., are invited by the Secretary.

The topics will follow much the same lines as other lectures given through the Association, a discussion of the extent and value of the forest possessions, the importance of the wood-using industries, the public losses through forest fires, and how to eliminate them, the care of woodlots, etc., etc. One hundred lantern slides will be used.

A Forest-Book for French Children.

The Canadian Forestry Associatin will have ready for distribution about January 1st a 32-page illustrated booklet in French telling of the forest, its dependent industries, the origin of forest fires, the care and value of the woodlot, etc., etc.

There will be about 30 photographic engravings, the whole resembling very closely the "Boy Scout's Forest-Book" which had a circulation throughout the Dominion of 15,000 copies, going to every Boy Scout and hundreds of school teachers and pupils.

Those who can place a number of these French booklets in the hands of French-speaking boys and girls of 13 years and upward are asked to correspond with the Secretary of the Association.

As the Association's funds are able to provide for only 5,000 copies, any member of the Association may undertake by private subscription to greatly increase this number.

The recent announcement that $1,000,000 will be spent by the Dominion Government in the construction of an aeroplane factory, probably at Toronto, lends special interest to the report that the proposed aeroplane station to be established by the United States Government at Duluth, Minnesota, will be made the basis of an aero forest fire patrol system. The state forester of Wisconsin has already secured excellent results from the use of an aeroplane for the patrol of a large area of forest in the northern part of the state, and it is expected that similar good results will be secured in Minnesota, from the co-operative arrangement which has been approved by the commander of the Minnesota Naval Militia. The main object of this patrol will, of course, be the prompt discovery and location of forest fires. The telephone system which has been developed will enable the forest rangers to be notified at once in case a fire is located, so that they can at once take all necessary steps for its extinguishment. State Forester Cox, of Minnesota, estimates that at least $45,000 can be saved the state annually with the installation of an air patrol.

In view of the great importance of Ontario as a timber-producing province, and of the enormous damage that has resulted in the past from forest fires, it is to be hoped that some co-operative arrangement may be possible, in connection with the testing of machines and training of men, under which a thorough test may be made of the practicability of using aeroplanes.

Negligence.

(Montreal Witness.)

An expert on forestry told the Dominions royal commission the other day at its Montreal sitting, that within twenty-five years Canada would have lost its wood pulp supply if conservation measures are not adopted meanwhile. This is not the first or second time we have heard something like this from authorities more or less distinguished. In fact we have heard it so frequently that possibly we have come to regard it as a "wolf" cry and for that reason take little notice of it.

It is many years since the Dominion conservation commission first gave this country warning on this subject. Since then the warning has been repeated times without number, and is still being repeated. Why should this be so? Of what value is a conservation commission if no notice is taken of its reports and warnings? Where are the wise men in governments of Canada, Dominion and provincial, who should be attending to this most important matter? What right have the people of this generation to continue squandering the heritage which should be merely used by them and handed down to posterity richer than ever before?

The expert who speaks to-day says that three things are working to bring our pulp wood forests to naught. One is the absence of any plan of reforestation, another the absence of any adequate system of fire protection, and the third is the great waste which is permitted by those who should know better in almost every forest area. In this connection he states that thirty per cent. of the pulp woods of Canada have been burned over and rendered useless for generations to come.

Evidently there is something radically wrong somewhere; something lacking. And it is surely time the people of Canada should insist upon their governments enacting such legislation as may be necessary to prevent early bankruptcy in this decidedly valuable department of the country's resources.

MONTREAL STAR ON WASTE OF THE FORESTS.

In the report of the Canadian Forestry Association for the current year, it is very clearly shown that with better guardianship of forests the danger of conflagrations would be immensely reduced. "The point we wish to emphasize," says the report, "is that the cost of vigorous and efficient forest guarding is a mere trifle compared with the amount of timber which efficient patrolling, etc., would save." Statistics in the report prove that in 1916 the forest fire losses totalled over nine million dollars. The fact is dwelt upon that in districts where the patrol service is satisfactory, fires are nearly unknown, but that the menace to the forest wealth is always in districts where the patrolling is poor, spasmodic and lacks efficiency. Facts such as these should be taken into serious consideration by the Government. The immense boon of forests is recognized in all countries, and the most earnest efforts are made to preserve timber. As to the origin of most of the forest fires in this country, facts show they are due very largely to carelessness. Laws are now being enacted in various provinces making it incumbent on settlers to get special permission before proceeding to clear spaces by the use of fire. It has been a matter of the deepest regret in many countries that adequate steps were not taken to protect forests, and they are setting aside immense areas for tree planting; but it will take generations before most of the trees reach maturity and can be of any commercial value. It behooves Canada to take this object lesson to heart.

Bricks Without Straw.

According to a despatch from Watertown, N.Y., a new process of making news-print without use of sulphite is to revolutionize the paper-making industry. The despatch appeared in the daily press a day or two ago as follows:

"Watertown, N.Y., November 28.—A process of news-print paper manufacturing that is expected to revolutionize the paper making industry was proclaimed a success here to-day. It

is known as the 'Lefebvre system,' and is the invention of Henry Lefebvre, of this city. Paper manufactured by this system in the mills of the St. Regis Paper Company near here was used by the Watertown Standard to-day in the first practical test.

"The system consists of washing the ground wood fibres as they come from the grinders with pure water into even lengths ready to be made into paper, thus making the use of sulphite unnecessary, sulphite being one of the most expensive items of paper manufactured to-day.

"Paper experts claim that the paper is of a better grade than that now used, and that a cheaper grade of ink can be used with equal results. The inventor says that this system of manufacture will reduce the cost of manufacturing one-half by abolishing the use of sulphite and doing away with much of the labor entailed thereby. Mr. Lefebvre was offered $250,000 for his invention, by the International Paper Company, which he refused."

To which the Pulp and Paper Magazine of Montreal adds:

"Ever since paper-making commenced on this continent experiments have been made to have ground-wood fill the bill without any aid from sulphite, but it has never been found to have strength enough, or flexibility enough to adapt itself to the modern high speed news machines. It is a well-known fact that there are hundreds of experiments made in our laboratories, but only one out of several hundred will have an economic value.

"Europe has been working on this scheme for years, and up to the present time all our improvements in connection with fibres have come from that continent. They manufacture one million tons of fibre per year, and have never spared any expense either in factory or laboratory to devise schemes which would lessen the cost of their annual output. With all due respect to the inventor at Watertown, it looks very much as if his much advertised find was not of a practical nature." '

Effect of Forests on Stream Flow

Experience has proved that the forest works efficaciously against many dangers resulting from the elements let loose, such as avalanches, falls of stones, erosion, earthslides, inundations. These are facts admitted and indisputable, but how and in what measure does the forest exercise this moderating action upon the destructive power of water? How can it lessen the destruction from inundations? It is in order to attempt an answer to this leading question that the Swiss Federal Station of Forest Research in 1900 installed an observing station in the basin from which two streams of the Bernese Emmental are fed. These streams, tributaries of the Hornbach, are located in the territory of the commune of Summiswald-Wasen, on the north-west slope of the Napf. The geological formation is fissured pudding-stone which decomposes readily. One of the basins, with an extent of 140 acres, is completely wooded. The other with an area of 175 acres has only a small average of wooded district, about 30 per cent.. The forest is composed of spruce and of alder bushes. The measurement of the precipitation, rain and snow, takes place regularly throughout the year. In each of the basins there have been installed three rain gauge stations at different altitudes. At the junction of the two streams with the Hornbach certain apparatus registers automatically every five minutes day and night the volume of the water flowing.

The Research Station has: 1. In case of storms accompanied with heavy rains the maximum outflow in the wooded valley is from 30 to 50 per cent. less than that from the other valley, and there is another beneficial circumstance from the action of the forest,

that this maximum flow is produced later in the wooded basin than in the other. 2. In the long periods of drought (the summers of 1904, 1906, 1908 and 1911) the wooded district gave without interruption a flow of water while in the denuded valley the stream dried up and all the springs ceased although at a normal time they have an abundant flow.

Attendance at Forest Protection Lectures

That the interest of Canadians in the subject of Canada's forests is particularly keen during war time has been proven by the large audiences which have been present at the illustrated addresses given by the Secretary of the Canadian Forestry Association during October and November.

Attendance was excellent at Queen's University, Kingston; University of Bishop's College, Lennoxville; Macdonald College, Ste. Anne de Bellevue; St. Andrew's College, Toronto; luncheon of the Montreal Electrical Association, and other engagements.

A Warning re B. C. Timber.

(From a Letter in the Vancouver "Province.")

Sir,—With reference to the agricutlural problem in the Coast or large timber sections of British Columbia, why not face the facts as they appear and admit that the land, except in the vicinity of towns and cities, is not worth the cost of clearing and that we cannot expect to get returned soldiers or immigrants to undertake it. No one could compete with the Prairies in raising grain on such costly land and no Government would have any excuse for spending the funds of the Province in such a costly venture.

The future of this Province rests largely on its great timber and mineral wealth and its fisheries, but even these great resources can be so exploited as to do little for the permanent good of the country. Minerals can be shipped into the States in its crudest form, and with the least possible leakage in this Province and leave us nothing but a hole in the ground, and our timber can be cut and shipped in the rough and leave us nothing but devastated forests and stump land while supplying the base for wealth in other lands, where it is turned into the finished product.

We can learn some lessons from the Southern States which fifty years ago were considered very rich in timber, but to-day it can hardly supply the poor quality that is needed for box manufacture. The timber of the South made great fortunes in the North, where it was manufactured, but the South is left with only denuded forest land, much of which can be bought for $3 or $4 an acre, and few sales at that. The United States Government is now spending millions of dollars to reforest mountain slopes from which timber was cut in order to prevent floods.

The forests of British Columbia are sufficient for all time if properly used, and will maintain a great population in the wood working industries with a little encouragement from the Government, but we should go very slowly to clear more land than can be profitably put in cultivation.

W. J. ALDER.

1936 Hampshire Road, Victoria, B.C., September 27, 1916.

The Canadian Forestry Association

(Seventeenth Year)

119 Booth Building, Ottawa, Can.

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The Association prepares and places through its Publicity Department, many hundreds of special articles every year, reaching the Canadian Public through daily and weekly newspapers, weekly and monthly magazines, including agricultural, financial, religious, literary, engineering, juvenile, and practically all divisions of Canadian journalism.

Co-operates actively with forest protective associations, Government forest departments and commercial organizations in distributing information on forest affairs to the Canadian public.

Campaigns for forest protection through its Publicity Department, the distribution of illustrated literature to settlers, campers, etc., the presentation of lantern slide cartoons in motion picture theatres, and many other methods calculated to bring practical results.

Holds series of illustrated public lectures on forest protection in various sections of the Dominion.

Issues an illustrated monthly, "The Canadian Forestry Journal," which goes to 3,500 members, and to 200 Canadian editors by whom it is quoted extensively.

Holds conventions in various sections of the country to discuss local and general forest problems, and to arouse interest in public forest policies.

A Free Cartoon Service is supplied to newspapers, also a free "cut" service, campaigning for forest protection through interesting illustrations.

These are a few of the concerns of the Canadian Forestry Association.

Support is entirely from voluntary sources. The Association is not identified with any Government or special interest whatever.

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