

# FOREST PROBLEMS OF EASTERN CANADA

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**T**HE forestry problems of all eastern Canada have been looming conspicuously for the last fifteen years. Ontario, Quebec, and New Brunswick, with large areas of Crown Land, have made a fair start toward solutions. Nova Scotia and Prince Edward Island, with little or no public land, have had small incentive to practise forestry. This article will deal largely with New Brunswick, as a type. While conditions here are far short of what they should be, our forests are as well managed, I believe, as those of any other province, and are in as good condition as any commercial forests of the United States.

The present discussion will deal principally with two closely related forestry problems that are now before the people of New Brunswick: protection of forests and general education. These to a certain extent are the problems of the whole Continent. Fire protection and general education in forestry must both be achieved before we can have real progress in woods administration. The public must know the value of the timberlands; it must have at least a newspaper knowledge of the forest and a little patriotic respect for it before fire protection or intelligent forest legislation is possible.

If the general public is well informed, and the woods are in the care of highly trained specialists whom the public trust and respect, the fire solution is simple. In much of Europe the fire menace in woods is almost negligible. Nearly all the countries in central and northern Europe have little or no forest fire damage. These states have indeed well organized forest services that have been in existence for decades, or even centuries. But not all of Europe is so fortunate, and much of northern and western Asia suffer from bush fires. Italy and Greece have had fires nearly every year. Turkey and much of Asia Minor had severe fires as lately as the past summer. China has little left to burn, but fires assisted in past centuries in devastating a great part of the Chinese Empire. The United Kingdom has few fires, for British woods are well protected. But these are mainly shooting preserves and are not commercial, especially

since most of the reserves were cut for war purposes. The present well organized forestry programme now being carried out by Great Britain will grow commercial forests, however, and will not tolerate fires.

The forest fires of southern Europe and Asia do little damage, because there is so little left to burn. Cattle, horse, sheep and goat pasturing does, in many cases, perhaps more damage than fire. Few people realize that pasturing is doing much injury in the eastern United States and will affect badly Canadian woodlots, as it has done in China, where the forests were cut, pastured and burned centuries ago and the people are now getting an unjust reward in flood, drought and famine. Fortunately, Canada is still in little danger of going the way of China, being favoured by topography, by a small population, and by vast stretches of potential forest land; but another hundred years of devastation may put the United States well on the way to Chinese droughts and floods. These conditions can be permanently remedied by education alone.

In considering forestry education in logical order, and afterwards forest protection, one should refer to the university facilities for training foresters. As the reader probably knows, there are four collegiate institutions in Canada giving technical instruction in forestry. They are widely distributed, being the universities of British Columbia, Toronto, Laval and New Brunswick. They are sufficient, I believe, for present needs. The United States went forest-school mad about fifteen years ago. They apparently believed that a tremendous number of technical men would solve the problems of conservation, but the result has not been entirely satisfactory, and we may profit by their mistakes. I think that a few very highly trained men, with good rangers and a well-informed public, is what will bring results.

I shall not bore the reader by dwelling on the facilities of the colleges that are training Canadian foresters, or taking up the details of instruction. It is sufficient, perhaps, to say that they are all producing good men. New Brunswick, at least, is not turning out half enough men to supply the demand just now, in spite of the industrial depression, but we believe more students will gradually take up the work, and we hope that the profession will never be so popular that—as in so many other callings—overcrowding and a scarcity of work will result. There is one tremendous lack, however, in our forest schools: we have no facilities for graduate training. If a student wants more than a four-year course, he has to go for it to Europe or to the United States. If an employer wants a highly trained man, he must send out of the country to get him,

or—if he can afford to wait—send a man out from here for the training. Canadian institutions should train their own men in advanced work in forestry. It is one of the crying needs of higher education.

But before *higher* education is improved, there should be improvement in *lower* education. I repeat that good foresters are being educated at the universities, but practically *no* non-technical men are being trained. For every graduate forester there should be at least a half dozen skilled rangers, and these simply do not exist. British Columbia tried a short course for foresters, but there is nothing of the sort in the East. New Brunswick made an effort in 1919 to train about a dozen men as rangers. The effort was in many ways a mistake, the organization and money were inadequate, and I consider the enterprise a failure. Rangers cannot be trained by ordinary vocational school methods, but they must be trained in *some* way.

The New Brunswick Forest Service employs some five or six graduate foresters. More would be employed if the Service could afford them and if the men were available. But some thirty forest rangers are employed steadily. These men act as scalers, fire wardens and game wardens. Many are highly efficient. All are skilled woodsmen, and New Brunswick woodsmen have a world-wide reputation. But none of them have any technical training, except what they have picked up from their superiors. Many do not even know that the compass needle points some 20° west of north in New Brunswick, or that there are three kinds of local spruces. A plan is now before the Minister of Lands and Mines that outlines a system for giving ten of the rangers two weeks of intensive training each year. This will probably be started next spring at the Provincial University and we hope it will be the nucleus of a ranger school that will give ten months training to every man who expects to be a Provincial ranger. These rangers should be in uniform, with the full authority of constabulary officers. They should be real men, with intelligence, courage, loyalty and ability, and should receive better pay than is given to rangers at present. A ranger school should be associated with every forest school of the Dominion, and men should be trained for private as well as government service when the demand for private rangers becomes greater.

Public school forestry logically follows university and range school work. It is significant that the Crown Lands Department and the University of New Brunswick are now planning a system of general education for the public schools and the public at large. It is hoped that the Education Department will co-operate. The

Provincial Normal School is the logical place to start. Some forestry education is now being given to New Brunswick teachers, and methods for improving and increasing it are now under discussion. With teachers understanding a little of the economic phases of forestry, with a little knowledge of the value of Crown Lands, of the game and fish interests, and of the rudiments of forest protection, the influence on the next generation must be stupendous. A trained teacher can keep forest resources before her pupils at all times. She can do the same with agricultural interests, and agriculture is now getting some share of school time.

Definite plans for educating children in forestry should not be made without the most careful consideration. The school curriculum is now crowded, the teachers are overworked and so underpaid that they must struggle to live decently. Some room, however, must be found to put a little forestry in the public schools. I believe New Brunswick is going to solve the problem, and that a workable plan will be made this year. Probably Provincial bulletins for teachers and pupils will be prepared by, or at least approved by, the Provincial Forester and will be the basis for this instruction.

Trained children will carry the knowledge home and will materially influence the next generation, but other systems of education will also help. The Canadian Forestry Association is probably doing more than any other single institution. But the individual provinces are doing too little. We hope to perfect a system that will reach everyone, giving everyone an idea of forestry in general and fire protection in particular. The public can be reached directly through the press, the churches and the agricultural societies. In a recent conversation with Mr. G. H. Prince, the highly efficient chief of the New Brunswick Forest Service, I was told that thus far many people have not been reached by Crown Land Department propaganda. Only last summer a fair-sized community was found that had never heard of the Forest Service. A bad fire brought the people into contact with provincial machinery for the first time.

In the minds of many well-informed people there is a peculiar lack of confidence in the Forest Service. Not long ago a gentleman with a responsible position in one of Canada's leading lumber companies told me that it was no recommendation for any forester to have worked for any government. He meant well, but was misinformed. Our politics are no better than politics elsewhere, and some of our politicians may be more interested in holding their jobs than in serving the public; but foresters, though public employees, are not *political* employees. In Europe all foresters practically are

government men, and so long as New Brunswick holds 7,500,000 acres of Crown timberland most of the foresters will be government men. I have yet to see any more conscientious or efficient foresters than the present small staff in the employ of the New Brunswick government. The citizens that still doubt them are getting scarce, and their doubts will disappear in a few years. I am not saying that all criticisms concerning foresters in general, and New Brunswick men in particular, have been or are unjustified. Some foresters have failed miserably in understanding the point of view of the lumbermen, of the farmers and of the general public. A forester at the present time needs high technical skill, but he also needs to see eye to eye with the lumber and agricultural interests, unless those interests are seeing absolutely wrong. It is for the public to see that only competent and efficient foresters are put in public places, and to insist that the lower jobs shall be held by men who are not political heelers. When the right men are in charge of the woods, the public can trust them. Foresters usually take up their work because they like it. The return in money is slight; the principal reward is the knowledge of maintaining a high principle, and the satisfaction of having attempted and done something of actual use.

Among the many things that the public should learn on this subject is to depend on the provincial foresters and the forestry departments of the provincial universities for any assistance that they may need. Since both forest services and universities are undermanned, the ordinary person cannot get much help, but every forester should feel that he is a public servant and should help the community. Let me quote a few cases where I have been asked questions since I have been teaching in New Brunswick. My own time is very limited, and I should have to refuse help if it were asked too often, but I have always devoted some attention to every question yet asked, and every forester known to me does the same.

One of the first questions I was asked was by a man on one of the back roads, who was selling some peeled poplar pulpwood. He could neither read nor write, but was hard-working and conscientious. He wanted to know where he could sell his wood and how much it should be worth f. o. b. at the C. P. R. station in Fredericton. I happened to know of a firm that was buying, and how much it was paying. His biggest offer had been ten dollars a cord, but he got thirteen dollars. Every Forest Service or Provincial university should have an organization that can tell small farmers or little, uneducated landowners what timber prices are, where timber can be sold to the best advantage, and help small owners in determining when timber should or should not be cut, besides assisting in the

regulation of pasturing, of insect or fungus damage, and in general woodlot management.

This helps only the small landowner. How can such an organization help the town dweller? I have been asked many times what sort of trees would be best suited for planting around a town house, how fast they would grow, how long they would live, whether or not they would be easily killed by insects, whether they would block up sewers (as the poplars all do), how and when they should be planted, what size stock is best to plant, where to get the stock, and other questions that would run into pages if I enumerated all of them. Every forester has this information at his finger-tips. He can usually tell at a glance what the situation is, and is glad to help. This shade-tree work is really not forestry but arboriculture,—a little department of landscape architecture, the same as tree surgery. But the forester understands trees usually much better than the architect, and it is easy to devote a little attention to this very interesting work.

Another demand that occasionally comes to our department is a query concerning the right use of timber. This is a subject the public may well study. Not even carpenters know the difference in many instances between ash and elm. Not one prospective builder in three knows spruce from balsam fir as he buys it in the lumber-yard. Nor does he know much about what these different timbers are used for. A good salesman will as a general rule sell the stuff of which he has a surplus, and the citizen who pays the costs of building takes nearly everything on the word of the lumber dealer and the carpenter. Even architects may need the forester's help. Last summer a friend, who was visiting in England, was talking with an architect who was trying to replace some panelling in a very old university chapel. The architect said he thought that pencil cedar (*Juniperus virginiana*, I suppose) was the timber needed, and asked my friend if it was still available in America. He was a classical man, with little knowledge of timber, but he told the architect to give him a sample of the wood that he might turn it over to our Forestry Department and get the required information. We received the wood and sent the architect what information we had on the availability of pencil cedar. But the sample was not pencil cedar. It was a very old piece of English oak. At a glance it looked a little like cedar, as it was light in weight and finer grained than oak usually is; age and finish had given it a peculiar reddish-brown cast, so the error was not so absurd as it appears. This is an example of how specialized skill may help at no cost to the individual and small cost to the State. Every builder likes to know

whether it would be better to use eastern white or western red cedar for a certain class of roofing. He likes to know what woods require careful preservation, and what will last almost indefinitely without paint. Advice on lumber of all kinds, nails, paints, and a comparison of wood with paper or metal roofs all come under the type of service that a well-manned forestry department can and should give the public. Millions can be saved by such public education. Much can be done, has been done, by government bulletins, but the real work has scarcely yet begun.

Thus far we have considered only the protecting of forest property in connection with education. Education and protection are so closely allied that sufficient education would render other protection almost unnecessary. But there are a few phases of protection that form distinct problems, and will have to be coped with directly and immediately. There are really four principal dangers, besides destructive lumbering, that menace the forest. Destructive lumbering is purely a commercial problem and outside the present discussion. The four others are fire, insects, fungus and animal damage. Fire is, of course, the main issue now. It is easy to lay down rules for fire protection but difficult to carry them out. While we are educating the public to be more careful of fire, the only thing left is to do just what the provincial authorities are now doing, but to do more of it. It is perhaps easiest to begin with the railroads. The C. P. R. sets few fires and puts them out quickly. The reason is obvious. The C. P. R. is under the Railway Commission and is under certain federal restrictions. Besides, the C. P. R. maintains a Department of Natural Resources with a competent staff of foresters and an organization for fire protection. They keep spark arresters on their locomotives in dry weather. They maintain a clean and wide right-of-way. Their firemen are careful not to clean the fire-box except in a wet place. They maintain a fire patrol on a gasoline speeder during dangerous weather. Their section foremen never burn old ties or rubbish along the right-of-way in dry weather. The Government Railways fail to do all these things. They probably would do them if they were put under the Railway Commission and forced to prevent fire. The C. P. R. has solved its own fire problems. If the other railways do as well, the yearly damage for railway fires in the whole Dominion will be slight.

Another method of fire prevention is not only to restrict and regulate, but actually to prohibit by law the burning of slash in land-clearing during the fire season. The principal New Brunswick fires start from slash fires that have got away. Permits have indeed

been granted to burn slash during the fire season and the permit is not issued unless the settler in question is careful and the situation such that the fires are easily controlled. But some bad fires have occurred even when the slash was burned by permit. If permits are issued at all, they should be regulated with the greatest care.

The other causes are principally from campers, driver rivers, fishermen, lightning, and deliberate incendiarism. These cause comparatively few fires; and with severe penalties, careful regulation and plenty of fire signs they may be almost eliminated. A good system of roads, trails, fire look-outs, telephone lines and fire-fighting apparatus must be maintained. New Brunswick is developing a fine system for getting rid of the fire fiend. The whole province, we hope, will soon be under observation from look-out towers. Systems of fighting fire are being studied as closely as possible and there is much reason for optimism.

Of the other dangers to the forest it is hard to say which are the worst. Insects are at least attracting the most attention. Some forty years ago, the tamarack (*Larix americana*) was almost exterminated by the larch saw-fly. There was apparently no remedy. The spruce budworm has recently killed in some sections all the mature fir. It has injured fir over nine-tenths of New Brunswick. It injured and killed tremendous volumes of spruce as well. This pest has now died out, but will it again occur in thirty or forty years? It is probably preventable. The Entomological Branch has done its best, and believe that by cutting fir heavily and thus destroying its natural feeding ground a new outbreak can be prevented. The white pine weevil is destroying the white pine. It does not kill the tree, but kills the leaders and distorts it badly. There is almost no young pine in the region of Fredericton that will ever produce timber. The Gypsy and Brown-tail moths do their principal damage to hardwoods. Brown-tails have been here and Gypsies are not far away. These are a few examples of insect damage. They are the worst that are with us now, or have been with us recently, but numerous others are doing some damage and may crop out as a terrible scourge any year. It is evident that we need to study entomology. Is it being done?

Fungus disease has not yet excited much interest in eastern Canada. The white pine blister rust threatens the existence of pine in the eastern United States. It is probably controlled by exterminating currant and gooseberry bushes (both wild and cultivated), for the disease is supposed to pass one stage of its life on shrubs of the *Ribes* genus. Perhaps we need not worry much about blister rust, for the weevil will have all the white pine before



the blister rust gets here. We may as well encourage white spruce and red pine, since they are thus far fairly free from disease. The chestnut blight, that probably came from Japan, has commercially exterminated the chestnut, nor do we know when an imported pest will kill the spruce. It is evident that we also need to study forest mycology. Are we doing it?

The last of the important phases of protection may be roughly included under "animals." Insects are so great a pest that we were justified in considering them separately. Other animals may be roughly grouped together.

Little is known about the action of wild animals on the woods. Birds have had some study in relation to insects, but other forms are just beginning to attract attention. Domestic animals are carefully studied by foresters, and their status is simple. What we have to do is to keep them out of the woods. With the population still as small as it is in New Brunswick, pasturing still does relatively little damage. In much of New England and the Central States the farm woodlots have been practically ruined by cattle, which eat up the hardwood reproduction, trample the softwood, encourage the growth of grass and weeds that are among the forest's worst enemies, and in general render the soil unfit for forest growth. Land may be pasture, or it may be forest, but it cannot be both. Horses and sheep are worse than cattle. Goats are worse still, and hogs are the acme of efficient forest destroyers. Hogs may have to be legislated out of the southern forests in order to save them. We have many bad examples in the United States of places where grazing should *not* be permitted. It will not come to a head there in perhaps twenty-five years. Then will we show progression, or will we follow the horrible example?

Pasturing is permissible in much of the West. The stands are open and they are naturally filled with grass. Pasturing reduces the fire hazard, brings a continuous revenue from the forest, and does little injury. It is unjustified in the East, where the owner should determine whether or not he is to raise timber or cattle, and use his land for the purpose that will pay best.

Concerning wild animals, we are just trying to make a start. The game situation is not to be considered here, and anyhow big game animals do relatively little damage to the forest, no matter how they may injure agriculture. The only group of animals on which I have especially worked are the rodents. I believe their action may make all the differences in many cases between profit and loss. Of these, the beaver are too scarce and too well controlled to do much damage. The porcupines are peculiar, being relatively

harmless in some places because they eat only inferior species, but in other areas they bark the most valuable trees. I worked in one forest in New Hampshire where they killed all the young white pines and injured all the old ones on several hundred acres. Across the valley they ate only beech, which was of very little use. Sometimes they take spruce, sometimes tamarack. In one place along the Cains River in New Brunswick, they appeared to prefer jack pine (*P. divaricata*). In spite of certain popular prejudices that porcupines are useful and will sometimes serve as food for lost travellers, I believe that their annual damage bill goes into the millions of dollars in Eastern Canada.

Other rodents are still harder to understand. I feel certain that in this same New Hampshire area that I studied the red squirrels were getting all the pine seeds every year, except during the occasional years when the seed crop was good. Other rodents, principally mice, also take their toll. I have a theory that small rodents may assist in increasing the fir reproduction in mixtures of fir and spruce. As the reader doubtless knows, there is an occasional good seed year, but all conifers seed a little each year. The fir cones are mature early in September. They fall to pieces at once, and the seeds get down to mineral earth and germinate. Often spruce cones, which are persistent, are cut off by squirrels and the seeds are removed. Or the seeds scatter out later, when food is scarce, and are gathered by mice. I have not yet proved this conclusively, but believe that it has some influence on the predominance of fir reproduction in certain areas. We should, of course, not try to exterminate even apparently noxious rodents until they are absolutely proved to be useless and injurious; but animals in general, and rodents in particular, may be the factor that determines the success or failure of natural reproduction and successful growth.

Our forests are a big national resource. We can educate our people to protect them, but legislation and the care of specialists must protect them during the fifty years that it will take to complete this education. We have made a good start—a better start than any other nation in the world, for other nations have not considered conservation until they were on the verge of a timber famine. The problem is to maintain this start, and increase our timber production while we continue to improve the condition of the forests.