THE ECONOMICS OF THE FOREST

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IN the present day of universal commercialism there is little room for the aesthetic side of forestry. The woods must be made to pay. Of course due consideration may be given to the use of the forest as a play-ground and to certain park reservations, but at least ninety per cent of the timberland of Eastern Canada should produce returns in money. This article will discuss the present revenues, and how the forests may be made to pay in the future. New Brunswick will be considered as a type.

New Brunswick has approximately twelve million acres of forest land. Of this, some seven and a half million acres were given by the Crown to the Provincial Government. The Crown Land Survey is not yet complete, and the true area or condition of the public land will not be known for several years to come. We do know, however, that there is much water, swamp, and unproductive burn within the boundaries. There is some land that is being cleared, and will be agricultural in a few years, so we may say that there are about five million acres of Government land now more or less forested and capable, without special treatment, of producing saleable timber. Much of New Brunswick's public expense has in the past been paid with the proceeds from Crown Lands. This is quite right, but a forest is a little like a farm—it will not continue to pay externally if everything is taken away from the land and little or nothing done for the land in return. The forest asks for little, compared with the farm, but that little *must* be done or its productivity will be lost.

A glance at the Crown Land reports will show that revenues have been generally increasing during the last few years. This is due to higher stumpage rates, more extensive cutting, and better Government supervision. Although the 1921 Crown Land Report is not yet in circulation, it is known that there has been a decrease in returns for the past year, due to light cutting, industrial depression, spruce bud-moth injury, and other minor causes. But we may consider the fiscal year that ended October thirty-first, 1920, as

typical. The returns that year were higher than ever before, but not, I believe, as high as they will be when the present industrial depression is over. The gross receipts for 1920 were $1,573,340. The Forestry Advisory Council asked for $150,000 for expenses, largely for the survey and for fire-fighting. In round figures we may assume that the net returns were $1,400,000 or some twenty-eight cents an acre per annum. This revenue is too small. It is not paying interest on the investment. Of course the public paid nothing for the land, but the land is *saleable*, so that an investment exists. We shall again assume that each of the five million acres of Crown Land has four thousand feet of timber standing on it. We shall also assume that the Government sells each of these acres with its stand. With stumpage at five dollars a thousand, which is the present rate, this would make each acre worth twenty dollars, with the land thrown in gratis. I believe each of the five million acres of Crown Land is worth, or can be made worth, twenty dollars, and that this estimate is conservative. The twenty dollars, invested in five per cent bonds, would yield one dollar per annum. If each acre is not now producing a dollar a year, it is theoretically not doing its duty.

Even if it is *not* doing its duty, should the Crown Land be sold, and the proceeds invested? Decidedly not, for this land is becoming more valuable, and with proper forest development the increase in revenue will be great. If an individual or a syndicate took over a large area of agricultural land, knowing nothing whatever of farming, it would not pay at once. Yet farming methods can be changed completely in one year, experiments can be made in a few months, while it takes decades or centuries to put the woods on an absolutely sound basis. And even if the woods do not pay interest, they must be maintained. Timber is a necessity, and the economic laws of price re-adjustment will create, in time, a price high enough to pay interest on any timber investment. Governments must wait.

Again, five per cent may be too high a rate to ask of this or of any forest. Forestry is a branch of agriculture, and similar returns may be expected. I lived on a farm for more than twenty years, and by the time I had begun to study interest in the district school it was evident that our farm did not pay five per cent on the investment, if the farmer and his family were allowed the wages of one first class farm labourer. Few farms in our community paid over four per cent. Yet those farms are still being worked, and are considered to be paying. Last year they did not pay one per cent. In fact they realized a loss, both in income and in capitalization.

On pages twenty-seven to thirty of *Forest Valuation*, published by Professor Filibert Roth of the University of Michigan, it is quite conclusively proved that the average farm of the United States does not pay three per cent on the investment, and that more should not be expected of the forest. Neither farms nor forests are more productive on this side of the International Boundary, and, although I have no complete New Brunswick statistics on the matter, such information as I have points to three per cent as about the amount that a local farm will pay. No larger percentage is paid by many European farms and forests, where forestry has been practised for centuries. There, however, the land may be worth a couple of hundred dollars an acre, and the revenue must be large if it is to pay at all. Pay or not, however, the work must go on.

When we consider spending ten dollars an acre to plant denuded land, and holding it for a hundred years to get good saw timber, the venture seems like "plunging" in oil stock, yet private corporations and governments all over the world must have the timber, and the risk must be taken. Many benefits are secondary; better climate protection from erosion, better health, more work for the population, and valuable products. A forestless world would not be livable, or if it were livable, civilization would be checked and we might be endowed with all the plagues of forestless China. So timber we must and will have, and it is evident that the people of New Brunswick get more than the paltry twenty-eight cents an acre from the Crown Lands, when these and the private lands provide the timber that makes the labour to feed half our population. The Government coffers do not get all the ultimate profits.

Yet the Provincial Treasurer gets too little. In most European forests a return of one dollar an acre per annum would be very low, and still the indirect benefits there are as good as here. The war has upset economic conditions in Europe, but I shall quote a few pre-war figures. Perhaps Switzerland will show the most interesting results from poor land, though our conditions are more like those of Scandinavia. Most Swiss forests, even in the high Alps, give *net* yields of over three dollars an acre per annum. Some go up as high as six dollars, and a few to even eight or nine dollars. The land is very expensive, and the stumpage, of course, is high. Perhaps twelve dollars a cord stumpage was the average before the war. It is even higher now. In Paris, in February 1919, I saw dry oak wood sold at the rate of forty dollars a cord; so, with labour and transportation as cheap as it is in Europe, a high stumpage rate is justified. Still in Fredericton in December 1920 I saw the best grades of firewood sold for twenty-five dollars a cord, and the

demand for it was good. Extreme prices may again prevail, and at no distant date. Prophecy is of little use in these times of tight money, but I am almost certain that wood, either construction timber or firewood, will be cheaper in 1922 and 1923 than it will ever be again. Other commodities have their ups and downs, but timber has been steadily advancing all over the world, and will not reach even the stabilization that existed in pre-war Europe until we have spent another hundred years on the forestry problem. Other construction material, and labour, may be cheaper in a few years, but I am quite sure that timber is now at its minimum, and is soon to show an increased demand and higher price.

To return to Swiss forest revenues :—We have mentioned only the *net* income. The gross income is usually about one hundred per cent higher. Half of the gross income must be spent on the forest itself. If we get a million a year or five million a year of net income from New Brunswick's Crown Land, the expenses will be about the same, to be spent in reforestation, better protection, education, experimental work, forest improvements, fish and game propagation and so on. Before most European countries got their woods on a paying basis, they spent nearly all of the proceeds of the timber sales on the forest itself for many years. I have heard several people say that the Provincial Forest Service was wasting a lot of money on the Forestry Survey, and that measuring the timber did not make it grow any faster. They were right in one way—count anything, and it remains the same—but wrong in another, for the Survey will just show the Forest Service how it can begin to work, where to begin, and, incidentally, how to begin spending money. If this land ever yields the Province five millions a year, the expense account of the Forest Service will total about the same amount. This will not be just yet, but it will come with good forest management.

I shall not attempt to explain any technical forestry methods. We must have bright boys for four years in College to give them a start. But a couple of problems for reform might be suggested. Take the spruce bud-moth damage for instance. This insect has been making a bad outbreak every thirty or forty years since we have any record of it. The last scourge has just burnt itself out. The Dominion Entomological Branch has estimated the damage in New Brunswick alone to be at least seventy million dollars. It has been worse than the Miramichi fire, and has been a staggering blow to the lumber interests of the Province. Another such blow would nearly put us off the lumber map. A lot of money has been spent in New Brunswick to study this pest. It has been clearly

shown that by the proper use of parasites and the elimination of large pure stands of balsam fir the Province may be made budworm proof before the next outbreak is due. The next outbreak will cost the Province twice as much as the last one, because it will probably be worse, and the lumber will be higher in price. But it should never occur at all, and never will if a properly manned Forest Service manages right and the lumber men cooperate. It will cost hundreds of thousands of dollars, but will save a hundred million.

We shall use only one other technical illustration—diameter limit cutting. At the present time it is customary in New Brunswick and many other places on this continent to set a certain minimum diameter limit, and to let operators cut everything above that limit. Ten or twelve inch butts are common diameter limits. Certain exceptions are made for dead or dying trees, swamp species and so on. Many believe this is the only way forestry is practised. It is a crude application of the selection system of silviculture, but the common result is that the large trees are cut and their removal smashes most of the small ones. The earliest record of diameter limit cutting that I know of is found in the *History of Forestry* written by B. E. Fernow, Dean Emeritus of the Faculty of Forestry at the University of Toronto. He mentions that in 1488 the city of Brunswick, Germany, bought stumpage limited to twelve inches. I am not sure whether this was breast high diameter, or stump diameter. Anyhow, it is much the same as our diameter limit cuttings that are being made as I write. Even selection cutting is not used extensively in Europe, except in Switzerland and other mountainous countries, and the arbitrary diameter limit has been proved to be a failure. It has been unsuccessful in the United States, and is not satisfactory in Eastern Canada. The only logical thing to do is to apply whatever system of silviculture the forest justifies, rather than apply one system when it is wrong in three cases out of four. But, bad as it is, the diameter limit has done and is still doing good work in New Brunswick. It is axiomatic that a poor system is better than none; this one must not be abandoned until the Province is equipped to apply something better, and that may not be for several years.

Europe gives us many examples of what we may expect or at least hope for. Some Swiss and Swedish forests are averaging an annual growth of fifty cubic feet of wood an acre per annum. Some are even up to seventy-six cubic feet. It requires a good acre in New Brunswick to grow seventy-five board feet per annum. In many instances Europe is growing ten times the wood that we grow on the same acreage, on land that is no better than ours.

Of course they have a market for poor grades, and get a good price for poor grades, and they have higher stumpage rates and cheaper labour, but they are beating us in forestry when they cannot beat us in farming, and this is because our agriculture is getting attention, and our forestry is not. The Europeans' better market and other favourable conditions are offset by our labour being more efficient and our tools and mills not only better but cheaper. Before the war it was possible to buy a thousand feet of good pine in the big continental markets nearly as cheaply as in the hardwood inland sections of the United States. To-day Scandinavian paper is mildly competing in the New York market with Canadian paper, so the difference in prices of wood products, especially the best grades, is not really great. Our problem seems to be to increase production of the soil and let the price take care of itself.

We should here mention the question of limiting the cut on private lands and prohibiting exportation. As the reader probably knows, it is illegal to export unmanufactured pulp wood, except poplar, cut on Government land. This is a good law, favouring local manufacturers. It would not usually pay to export round saw timber, but pulp bolts are easy to handle. There is some agitation to prohibit the export of pulp wood cut on private lands, or at least put on a prohibitive export tax. The reason is well known. The United States is using a great deal more wood than is being grown, and the question is just whether or not exports will be so great as to endanger the life of Canadian paper companies. People have widely differing opinions on this point. As it looks to me at present, the small timber owner needs the best price he can get for his product, whether he sells it in New York or in Montreal; it injures his income and savours strongly of paternalism to prevent him from selling where he chooses. I believe further, that as we improve our home market we can make our land more productive, and increase rather than diminish our exports. There is one lamentable evil, however, that is undermining the foundation of our economic plant; we are not making sufficient effort to manufacture our own raw products. True, we are an extensive rather than an intensive country, but we can manufacture more than we do. There are half a dozen pulp mills in New Brunswick, but they make little or no paper. The pulp is sent mostly to the United States to be manufactured into paper. Why can we not make the paper ourselves, selling a valuable rather than a cheap product, saving transportation charges, and making labour? It is inexplicable to me why we should make such an effort to manufacture cotton, which we can never grow, and neglect wood, that is our most eagerly sought export product.

It generally pays to manufacture raw material where it is grown, as one may illustrate from the case of cotton. Formerly all American cotton manufacturing was done in New England. Now, although the South has barely recovered from the Civil War, and has had no protection whatever for its manufactures, the cotton mills have sprung up almost in the cotton fields. It paid to put them there, and it pays to turn out a completed paper product as near the woods as is economically possible.

The paper companies are becoming more interested in forestry, and the complete manufacture of their products will make them better able to afford intensive methods. Many lumber companies still pay no attention to conservation. Their investment is small, their mills are cheap, and when the lumber is exhausted they scrap the mill, and liquidate or move somewhere else. Saw mills will be still smaller in the future. The portable mill with an investment of a few thousand dollars, and employing a dozen men, will be the lumber plant of 1950. Some permanent saw mills will be located at paper and wood distillation plants, and there may be a concentration of wood manufacturing in certain places, with paper as the principal product. But small paper mills are not practical, so the paper manufacturers are becoming alarmed. Since the investment cannot be written off in a few years, forestry is expected to perpetuate the wood supply and maintain the plant indefinitely. We believe that it is possible to *grow* more timber than is now being cut per annum. But it will take many years to do it, and there may be a bad pinch about 1950 while we are waiting the development of immature stands. Pulp wood grows under a short rotation, and there is a probability that denuded land may be planted at a cost of perhaps ten dollars an acre, and produce pulp quickly enough to make a fair business investment. This will not be possible for saw timber for many years.

Before leaving the discussion of the paper problem we should perhaps consider the possibility of competition with Canadian paper in the United States. I know of only one large area of easily available virgin pulp timber left in the world,—namely, Alaska. There is one pulp mill there now, more will be built in a few years, and Alaska it is believed can cut as much pulpwood per annum as now goes into Canadian exports. Canada is now supplying nearly one hundred per cent of the paper and paper material that goes into the United States. There is a little Scandinavian competition. In the future there may be heavier competition from Russia, Poland, Finland, and Jugo-Slavia. The export business needs the study of highly trained Trade Commissioners before any drastic

action is taken or before a plan for the future can be made. I believe our location and resources make us the natural paper manufacturers for the United States, and that paper exports to that country should be not only maintained but increased. We may compete with Norway in London, but if so, we must compete with Sweden in New York.

We have said that forestry methods can only be touched on in so brief an article, but our discussion would be very incomplete without mentioning the three schools of thought that have developed on the forest problem. No technical questions of great difficulty have arisen, but the very basis of thought is badly divided. One group—a few foresters included—have been brought up on a "woodman, spare that tree" doctrine. They curse the devastating lumber man. They sigh at a wood fire or a pile of boards, and try to legislate against the Christmas tree. Their principal idea seems to be poetic sylvan beauty, and prohibition of cutting, without regard for economics. They want to save what there is in its present wild conditions. The second school includes nearly all the rest of the foresters, many lumber men, and many who have no business interests in the forest. They believe lumbering methods may be improved, but that sentimental prohibition is the wrong method. They believe in the proper treatment of wood, and in using the right wood for the right purpose. This alone will double the available wood supply, if a little conservation of paper is practised with it. This same group believes in making it unnecessary to practise destructive logging, and in improving taxation rather than imposing Germanic restrictions on private lands. They believe also that most lumber men mean well, but do not practise forestry because they can't afford or don't know how to do it. Between these extreme groups, there are a large number of people who neither know or care anything about forest economics; there are some grasping lumber men, some shrewd politicians, and astute business men who are bent on getting their own nests feathered from the exploitation of timber, cost what it will to the future. I know this last group is getting smaller each year. I believe that, in Canada, the sentimentalists also are losing numbers, and that a logical thought in forestry matters is being developed.

This logical thought may mean a little more sympathy for the lumber man and his problems. I earned my living for several winters as a lumber-jack or in a sawmill, and from first hand acquaintance I learned that but few lumber men are ruthless devastators. I also found out too well what many lumber men have had to endure in the name of forestry. The lumber man is not a forester

and never will be; his principal work is removing timber, and not producing it. But lumber men know more about forest economics than any other group of people in the world, perhaps including foresters, unless the foresters have had very broad practical experience. It takes a business man to solve a business problem. Lumber men are good business men, and if we can show them that their business is going to the dogs, and they can save it, we are sure of their interest. They have been afraid it was going to the dogs, and that there was nothing to do to save it, or else they were too stiff-necked to admit that the supply was nearly exhausted. The development of the forest in the future will depend largely on the interest of the lumber men and paper men.

We are too prone to believe that all things good in forestry come from Europe. Old Country results are excellent in most cases, but the methods are frequently primitive and sometimes ridiculous. I saw some logging in France, in Hayte Marne, Savoie, and Vosges. I worked for over a year in the pinery of Loire et Cher and Indre. French logging is unspeakable. Imagine, if you will, three Frenchmen going out to cut a large maritime pine. They have very heavy axes, built to last, with long, straight handles, and a general design like King Richard's battle axe. They have a saw, *minus* all the rakers and half the teeth. There may be a couple of spades and hoes, a long rope, certainly a large loaf of *pain* and a couple of gallons of *vin rouge*. If the men are wealthy, the lunch will be embellished with cheese and sausages.

After a few minutes of jabbering, a smoke, and a couple of drinks, the victim is selected. Then follows a parley to determine whether the tree shall be felled or dug out by the roots. It is finally decided to chop it. The old man of the group begins at once to chop. The others climb the tree, dragging one end of the rope, an axe, and a brush hook. As soon as they get started, the boss desists from his work, stands some distance off, instructs, smokes, spits, and—if the situation becomes too tense—has another drink. The boy with the rope goes nimbly to the top, and ties it fast. The ground man hitches the other end of the rope around the butt of a tree to keep it clear of the branches. He then chops a little more, going around the tree, *a la castor*, but looking up and giving a yell when an occasional branch falls, for—be it known—the boys up the tree are trimming it so that its fall will not injure other trees. By the time the trimming is done, the labourers need refreshment. They reach the ground, and everyone eats a slice of bread, and perhaps a slice of cheese. This is reinforced with several drinks and a smoke. Then the two swampers begin cleaning up the branches,

while the old fellow beavers away at the stump in dead earnest. The big branches are usually cut a given length—perhaps a metre—and the small ones bundled into fagots and tied with a bit of green shoot. Not a scrap is wasted. By the time the branches are cut up, it is time for another lunch, but the tree is then tottering, so all hands drag on the rope in the direction in which—they hope—the tree is to fall. It finally goes down. The celebration that follows disposes of the remaining food, and lightens the wine jug perceptibly. Finally the bucking up process begins—but it would take too much time and too much of the Editor's space to follow the logs through the primitive hauling process, and the outlandish milling that results for all that in a very finely finished product. But follow through the whole process, and I think we should all agree that Canada is a pretty good place for lumbering. Of course, in parts of France methods are not quite so bad. In Scandinavia logging is done fairly well, but nowhere else in the world is the efficiency of the United States or Canada even approached.

Nevertheless, we can learn a great deal from Europe and I believe we are working toward the right goal, which will be a combination of European conservation and New World efficiency, tempered with sound economic judgment, without the handicap of tearful sentimentalism.