

while for fuel it is among the very best of our native woods. The soft maple, while favored by bee-keepers on account of its flowers, is not so valuable as a timber tree, and is shorter lived.

Of the evergreens, next to the white pine in value for planting is the Norway spruce.

The basswood or linden is another of our most suitable trees for planting. It is a rapid grower, its wood is much prized by carriage, cabinet, piano and organ makers, while its flowers furnish our bees with the choicest honey. Principally because of this latter feature one of our most prominent apiarists, Mr. Allan Pringle, of Selby, has planted this tree quite extensively, as has also Mr. Thos. Conant, of Oshawa, who, however, regards the black walnut as the more valuable tree to plant.

The white elm, or rock elm, one of our most graceful and best shade trees for streets, is becoming yearly more valuable. The demand for the best quality of timber for the rims of bicycle wheels has assumed large proportions and makes it a valuable tree to plant. It is also used largely for wagon hubs.

USES FOR FOREST PRODUCTS.

The substitution of steel and iron to a large extent in the construction of ships and buildings has lessened the demand for oak for these purposes, but the scarcity of black walnut and rosewood helped to cause a change in the fashion in furniture. Oak became the popular material and in consequence this wood is in greater demand than ever. Hickory is also another wood that is also becoming more valuable. Where it was formerly used only for handles for axes and other tools, its present consumption in the manufacture of carriages has reached enormous dimensions. A new use for this timber is in the handle-bars for bicycles, which are likely to be made in future from hickory instead of steel tubing. The bicycle, which seems to be effecting a revolution in business in many ways, has furthermore created a heavy demand for rock elm, which is required for the manufacture of rims. As only a small percentage of the timber is good enough for the purpose, the increase in the total cut caused by this new demand is very large.

By far the most significant and far-reaching change, however, arises from the rapid and extensive growth of the wood pulp and paper making industry. The great expansion of daily journalism in Canada and the United States has created an enormous demand for white paper, various kinds of wood being brought into requisition as the invention of new processes rendered them available for the purpose.

While poplar, basswood and jack pine are used in the manufacture of paper pulp by the chemical process, for the cheaper mechanical process by which most of the pulp used in newspaper making is produced, spruce is almost exclusively employed. The spruce forests of Ontario are of vast extent and stretch to the far north surrounding Hudson's Bay. Many of these northern forests are composed exclusively of spruce trees, growing so densely that, although very old, they do not in some sections attain a diameter that would make them available for lumber. Until the rapid strides of the pulp industry drew attention to this raw material awaiting the future demand these forests were not largely taken into account in the

stock-taking of the province. This is now changed, however, and spruce rivals the great white pine in its value to the state. It is now pretty generally conceded that Canada has the largest supply of spruce, the great paper-making material, in the world. As the supply in the United States becomes exhausted there can be no doubt that the spruce forests of Ontario will prove a source of wealth to the province, the extent of which it is difficult to estimate.

ANNUAL GROWTH OF TIMBER.

OTTAWA, 24th August, 1896.

To the Editor of the CANADA LUMBERMAN:

In sending me a copy of the annual report of Mr. Southworth, the Clerk of Forestry for the Province of Ontario, you ask my views as to the correctness of his remarks relating to the annual growth of timber, as found on pages 33 to 36 of his report.

I must frankly confess that at first sight I was staggered by Mr. Southworth's statement that on the Crown lands of Ontario the annual growth of the forest is fifty times greater than the annual cut; for this is the unexpected conclusion to which we are unavoidably led by Mr. Southworth's figures (see page 35 of his report), which give the annual cut at 60,695,250 cubic feet, and the annual growth at 3,072,000,000 that is to say fifty times more. But after testing, by such means as I will explain in a moment, the correctness of Mr. Southworth's statement, I must admit that he is theoretically right, on the assumption that each of the 51,200,000 acres of Crown lands, on which he founds his calculations, is capable of yielding an average growth of sixty cubic feet, and in justice to Mr. Southworth, I must here remark that he makes a liberal allowance for regions poorly timbered, for in giving the area of the Crown lands on which he founds his calculations he leaves out a good deal more than one-third of the total area of 134,000 square miles, as he deducts out of that 54,410 square miles, and founds his calculations on only 80,000 square miles, equivalent to his 51,200,000 square acres.

Now, this is the test by which I come to the conclusion that Mr. Southworth is theoretically correct. For many years past I have studied the rate of annual growth of some of our forest trees by measuring their annual rings. I am aware that it has been stated, on the strength of Charnay's observations in tropical regions, that these rings cannot be taken as indications of yearly growth everywhere, but I think that can apply only to tropical regions where the vegetation continues all the year round. With us, where the vegetation is abruptly interrupted in the autumn, to start again the next spring, I consider that each ring indicates the growth of one year, and I have found it so by experiments continued during the last eighteen years, cutting down trees sown by myself, so that I knew their exact age on counting the rings at the stump, which agreed with the number of years elapsed since the seed out of which the tree grew had been planted by me in the ground.

Over and over again, by measuring these yearly rings, I have tested, on the butt end of saw-logs, the rate of growth of the white spruce tree in our part of the country, Quebec, and found that it takes about ten years to add two

inches to the diameter of the tree. At this rate of growth I find that a white spruce twelve inches in diameter will gain, in ten years, eight cubic feet, which would give four-fifths of a cubic foot every year, and if you allow 75 spruce trees to the acre, it will give you 60 cubic feet for the yearly growth. Perhaps there are not many acres on which will be found 75 good-sized spruce, but, on moderately well timbered land, the equivalent in bulk of the timber represented by 75 spruce trees, of say 14 inches at the stump, will be found in other trees, and it can be easily ascertained by comparing the yearly rings of the white spruce with those of the black walnut, butternut, pine, oak, ash, poplar, elm, and some others, that the growth of the white spruce is slower than that of the above mentioned trees, so that I feel justified, like Mr. Southworth, in adopting the United States figures of 59½ cubic feet (which he assumes at 60 feet for facility of computation), the more so that we have the statement of eminent authorities in England, who estimate the annual growth of one acre of Scotch pines at 100 to 120 cubic feet nearly double the rate allowed by Mr. Southworth.

So that, in answer to your inquiry, I consider that he is right in his conclusions, provided always that his 51,200,000 acres be sufficiently well timbered to yield the yearly increase of 60 cubic feet per acre.

But because there are sufficiently good grounds for Mr. Southworth's conclusion that the rate of growth of our forest trees is so much greater than the rate at which they are cut down, we must not abandon ourselves to a feeling of false security and run away with the idea that our supply of valuable timber is inexhaustible, nor must we relax our efforts towards such a rational working of the Crown forests as will insure their preservation and improvement.

However, Mr. Southworth's statement (that the yearly growth of trees is so much in excess of the yearly cut) may apply to the general yearly increase in the growth of trees of all kinds, but it must be admitted that in all the forests comparatively easy of access, where pine and spruce used to be abundant, the cut of these two species of trees has been far in excess of their yearly growth, so that the lumbermen are compelled to go farther and farther every year for their supply of timber, and that the quality of what reaches the market is not such as it used to be. The question of interfering with the lumbermen, by limiting the proportion of trees to be felled yearly on each square mile of their limits, presents what appears insurmountable difficulties, for the present at least, in the absence of a regular system of management of our Crown lands, such as prevails in some of the countries of Europe, placed in such different circumstances from ours. However, sooner or later we shall have to open our eyes to the necessity of protecting our forests more effectively than we do now, if we wish to hand to those who will come after us the valuable inheritance which without any exertion on our part we now so fully enjoy, and we ought to be grateful to those who, like Mr. Southworth, give us food for serious thought, and make us feel it our solemn duty to watch over the life of our forests with more care than we have ever done.

Yours truly,

H. G. JOLY DE LOTBINIERE.