

CANADIAN WOODS FOR CARRIAGE BUILDING.

A COUPLE of months ago THE LUMBERMAN briefly referred to a paper read at a meeting of the Institute of British Carriage Manufacturers, by Professor John Macoun, Botanist to the Canadian Government, on the "Timbers of Canada suitable for Carriage-making." Through the courtesy of Mr. Macoun, we are now enabled to produce his remarks almost in full, and coming as it does at a time when the excitement of an election contest precludes any great amount of news concerning the lumber trade, we have no doubt but that one and all of our readers will feel a personal interest in the remarks of this talented gentleman. Among those present at the meeting above referred to was Sir Philip Cunliffe-Owen, K. C. M. G., chairman, the Hon. G. Quinett, (Canada,) Messrs. A. Ransome, L. Ransome, Ira Cornwall, J. Burn, Bishop & Son, Allison, F. Joplin, C. Chapman, A. W. Wright, (General Commercial Agent for Dominion Government,) E. B. Biggar, (New Brunswick,) G. N. Hooper, and many others.

Professor Macoun, on rising, said: Gentlemen, although my remarks will chiefly refer to woods used in carriage building, I feel convinced that my audience will bear with me while I make a rapid sketch of the lumbering business and point out on the accompanying map the localities where it is chiefly carried on. New Brunswick, Quebec and Ontario are the chief seats of the timber trade, and there is not a river in these three provinces where a saw log will float but has its sawmills or its lumbering firms. In northern New Brunswick there are still extensive forests of maple, beech, ash, basswood, birch, oak, poplar and elm, of very great size, besides the great tracts covered with hemlock, black and white spruce, red and white pine, as well as swamps of larch and cedar. Owing to their positions these forests remain untouched, and when a projected line of railway is built, large supplies of timber for every branch of business will be laid upon to commerce. I particularize this region because it is nearest the seaboard than any other untouched locality. At present spruce and pine, with a little ash, are the only woods exported.

Quebec has been exporting pine timber for generations, and still has very large quantities, but it is chiefly confined to the upper waters of the various streams entering the St. Lawrence. The same hardwoods which occur in New Brunswick are still in abundance, but are getting more difficult of access owing to the advance of settlement. Cedar, larch, and spruce are abundant, and were the demand greater there would be more produced.

Northern Ontario possesses the most extensive pine forests now existing in Canada, perhaps in America. These extend from the Ottawa river on the east to Lake Superior on the west, and lie on both sides of the Canadian Pacific Railway. West of Lake Superior there are extensive tracts covered with pine, spruce, larch and cedar, part of which is being utilized, while the greater portion is being destroyed by fire. The hardwoods mentioned as growing in the other provinces are more abundant in Ontario, and the species are in much greater variety. In the Ontario forest sixty-five species of trees grow in profusion, while in England only fourteen are found native.

A belt of timber composed of poplar, spruce and larch, and one species of pine (*Pinus Banksiana*), extend from the meridian of Lake Superior westward to the Rocky Mountains, with a depth of about ten degrees of latitude. This belt contains much fine timber, especially in the river alleys, part of which will find an outlet by Hudson Bay.

The Rocky Mountains and British Columbia contain in their recesses the finest coniferous forest on the continent. This, if properly looked after, would be a source of profit for centuries but past experience tells me that a few short years will see only blackened stumps and fire-scorched trees, where the stately fir and cedar show their crowns of waving green as the breeze passes through their tops two hundred feet above the earth.

From the data just given, it can be easily shown that there can be no uncertainty about the supply. I am afraid that our people would cut down too much and have no profit on their labor. Were there a timber bureau or exchange organized in connection with the contemplated Imperial Institute, dealers might be made aware of the anticipated wants of consumers, and producers could be instructed accordingly. There need be no fear of the supply of spruce and larch, and of the coarser kinds of pine lumber, giving out, as we have immense tracts, unfitted for agriculture, covered with this class of timber. It is true that fires do great damage every year, but that applies more particularly to pine forests, as these grow on dry and generally sandy soil. Fire passing through a Canadian forest simply means the re-covering of the land with a different variety of tree, as pine lands, if the soil be fairly good, seldom become covered with pines again.

I may be permitted at this stage to make a few practical remarks on forest conservation and practical forestry in general. The Imperial Parliament has taken up the matter of a School of Forestry for England, and much discussion has taken place regarding it, and much useful information has been elicited by the Parliamentary Committee appointed two years since. In looking over the evidence I was struck with the clear-sightedness of a number of the witnesses, though I could see that their environment was rather restricted, and their

views partook of their surroundings. As I am acquainted with the conditions under which the 110 species of Canadian forest trees exist, flourish and mature, from the Atlantic to the Pacific, I may be permitted just here to make one or two broad statements. Before doing so, however, I may state that, should any gentleman desire it, I will give him, at another time, the soils, localities and atmospheric conditions under which each and every species flourishes in Canada. For over thirty years I have studied the flora and climate of Canada, and collected every species of tree in its native habitat so that answering questions as above requires no preparation.

Mixed forests are always the best in Canada when size of trunk is considered. Lumbermen prefer the pine to be in groves, as it costs less to get it to the water. No two species of tree have ashes containing the same constituents, hence the more diverse the ashes the better suited to plant together. Conifers produce little ash, but deciduous trees much; therefore I would mix by having say a pine and an oak. The pine has a pyramidal top and grows faster than an oak, while the latter has a broad top and is slow of growth. Pine (*Pinus strobus*) and oak (*Quercus alba* and *rubra*) grow together in many districts of Canada, and both are very healthy. Larch requires undrained soil, and can thus resist a hot climate, but a constant supply of moisture at the roots or a cool moist atmosphere are its essentials.

Let me give you an actual forest picture, as seen in many districts in Canada. You stand on a hummock in the centre of a tamarac (larch) swamp, all around you are small larches, scarcely rising twenty feet above the swamp, which is composed of species of sphagnum and hypnum, and interspersed with ericaceous shrubs. Far in the distance you see trees of other kinds, and you walk towards them. As you proceed the trees become larger and are soon of a merchantable size. Soon cedar (*Thuja occidentalis*) begins to mix with the larch, the soil gets firmer, the sphagnum disappears and you are in a cedar swamp. The larches are now very large. Still passing outwards a few black ash (*Fraxinus sambucifolia*) are met, and these soon predominate, and you are in a black ash swamp. Reaching almost dry ground you meet with soft maple (*Acer rubrum*) and American or swamp elm (*Ulmus americana*). These extend to the margin of the wet ground, and you now meet with beech, birch, maple, white ash, rock elm, and the various other hardwood species of dry and a able soils. In many cases this good land is traversed by ridges of gravel or gravel and sand, and here you will find oak and pine growing together, seldom the one to the exclusion of the other, in the central parts of Ontario; but north, only pine is found, and south, only oak in such places. These are the conditions under which a few of our trees live and go through their round of existence.

It is now time to come closer to the real object of the lecture and introduce what is essentially the subject of my discourse—'Canadian Timbers suitable for Carriage-building.' I have been permitted, however, at a later stage, to make some remarks on species suited for other purposes.

List of elastic woods valuable for carriage building:—

1. Shell bark hickory (*Carya alba*).
2. Bitter-nut hickory (*Carya amara*).
3. White heart hickory (*Carya tomentosa*).
4. Pig nut hickory (*Carya porcina*).
5. White ash (*Fraxinus americana*).
6. Black ash (*Fraxinus sambucifolia*).
7. Rim or red ash (*Fraxinus pubescens*).
8. Chestnut (*Castanea vulgaris*).
9. Cherry or black birch (*Betula lenta*).

I ELASTICITY.

Ash and hickory are noted everywhere for this property, but in commerce only two species are taken into account—White ash (*Fraxinus americana*) and shell-bark hickory (*Carya alba*). It is well known, however, that all the Canadian species of ash possess this property in an eminent degree, and both black and red ash have been used from time immemorial by the American Indians in the manufacture of baskets, on account of it. Red ash, or Rim ash obtained the latter name from the early settler in Canada, because, when hammered, each year's growth separated from its fellow and enabled the Indians to get the thin ribbon like pieces which they use in their basket work. Much has been spoken and even written on the great value of 'second growth' ash and hickory, yet a clear conception of what is meant seldom enters the mind. In England I have heard of the superiority of English ash as a species, but this I deny, and assert as a fact that it is due to the conditions under which it is grown. English ash is grown on lawns and in the hedge-row; ours, which reaches England in square logs, in the close forest, where it is protected from both storm and sunshine. Second-growth ash, on the other hand, is young timber grown in the corners of fences in the old settlements; or young forest growth which has sprung into existence since the old was cut or burnt away, and has been produced under the same conditions. The same remarks are applicable to hickory, and the wood grown in the old forest bears no comparison with the second growth.

I consider elasticity a property of young wood, and the greater the exposure the more it is produced. Should this be a fact—and I have no doubt of it—there is no reason why

Canada could not produce all the ash and hickory for every variety of agricultural implement and vehicle required in England. We have millions of acres of waste lands growing up with young wood, which to-day are of no value, but which in twenty years, if merely let alone, would fully supply the English market as well as our own.

LIST OF WOODS NOTED FOR TOUGHNESS.

1. Basswood (*Tilia americana*).
2. Common or white elm (*Ulmus americana*).
3. Rock elm (*Ulmus racemosa*).
4. Slippery elm (*Ulmus fulva*).
5. Beech (*Fagus ferruginea*).
6. Hornbeam (*Carpinus americana*).
7. Ironwood (*Ostrya virginica*).
8. Walnut (*Juglans nigra*).
9. Butter-nut (*Juglans cinerea*).
10. White oak (*Quercus alba*).
11. Blue oak (*Quercus bicolor*).
12. Pin oak (*Quercus palustris*).
13. Grey oak (*Quercus macrocarpa*).
14. Sycamore (*Platanus occidentalis*).
15. Red maple (*Acer rubrum*).
16. Whitewood (*Liriodendron tulipifera*).
17. Whitewood, Cottonwood (*Populus monilifera*).

II TOUGHNESS.

Toughness and elasticity, although often combined in the same wood, as in the various species of elm, are not necessarily produced under the same conditions. Elasticity, as I mentioned above, is a youthful state, while toughness is produced from the interlacing of the fibres, and is found at all ages. Our three elms, common or swamp elm (*Ulmus americana*), rock elm (*U. racemosa*), and slippery elm (*U. fulva*), are in their young state so tough that in many cases it is impossible to split them. I have seen thousands of young elms ranging from six inches to eighteen inches cut down close to our railways and burned up on the ground because they were so tough that they were almost useless for firewood, and not worth the labour of converting into firewood. Did English purchasers and Canadian producers understand their business better these small trees would be cut up in Canada of the required size, or merely cut into plank and shipped to England when partly dried. Or, better still, English capital, managed by competent men in the interest of the manufacturer or dealers in England, could produce just what was wanted and forward direct, so that the heavy charges now paid to middlemen could be dispensed with. I see no reason why Englishmen cannot look upon Canada as an integral part of the Empire, and place their money there with the same freedom they do in this little island.

Another tough and invaluable wood to the carriage builder is basswood (*Tilia americana*). Besides its lightness and easiness to work, it possesses the valuable property of retaining any shape required by the builder, and for the bodies and panels of carriages is unsurpassed. In both Canada and the United States it is considered a valuable wood for every purpose requiring lightness and strength. Our manufacturers use it for sounding-boards for pianos, as it will not warp, for chair bottoms, sleighs, fanning mills, and other purposes of a like nature. Bowls and woodenware generally are made from it, besides many toys and various little articles. To the cabinetmaker it is also valuable, as it can be stained any color, and often passes for much more costly wood. Whitewood is also a valuable wood, but is becoming scarce in Canada as it is confined to the western part of Ontario, chiefly along Lake Erie. It has been asserted with much truth that Canadian oak is far inferior to English, but the fault lies more in the conditions of growth than in any specific distinction. English elm ash, and oak are grown in the open ground, and hence are as tough as they possibly can be, while only the full grown forest tree is shipped from Canada. No trees of these genera are cut for export in our forests, except those that will square a certain size, and therefore the timber exported is our most brittle and weak. We have now in Canada around the old settlements, in fence corners, and in the forest, cut many years ago an enormous quantity of young wood ranging from twenty to sixty years of age which is considered of no value, as there is no demand for it. This is the class of wood you want and cannot get because your own country does not produce enough of it. You reject our forest-grown wood and say it is of second-class quality, and tell us our woods are far inferior to yours. I retort by telling you that you can get the wood you desire by changing your mode of purchase. Let any competent man go out to Canada and have a lot of young oak, ash, elm, and hickory sawed up into plank of the size you want, let it be partly seasoned, and then shipped direct to the manufacturer. Then you will get good cheap raw material, and with your machinery and skilled workmen there is no reason why you cannot build carriages of better quality more cheaply than you do at present.

So that you may understand the ignorance that prevails in Canada regarding our own woods, I will relate one or two instances of this character. Last autumn I was collecting samples of wood for the Indian and Colonial Exhibition, and went for that purpose to the Niagara peninsula. At Queenstown Heights I purchased a lot of second-growth hickory for hammer handles for the use of the Geological Survey, and at