

Of these the White Spruce (*Picea alba*) seems to depend, for its occurrence, particularly upon the marine deposits, whether sandy or clayey soil, and is not nearly so dominant a tree as in the western part of the subarctic Canada (see "Can. Forest. Journ.," for July, 1919).

Balsam Fir Prevails.

The Black Spruce (*Picea nigra*) is extremely common upon both sandy, hilly, or swampy soil, and it has been estimated, that it forms about 90 per cent. of the forests, up there. To the south its growth is very thick, but farther north more open, and the trees are better developed, with the branches spreading, as in the case of white spruce. It will be seen from the accompanying pictures, that even near its northern limit the trees reach a considerable size, on protected places of the mainland and large islands. Its insect-pests, however, follow with the tree all the way north, as proved by the several species of bark-beetles I collected from it at various localities from Charlton Island in south to lat 56°N., and which have later been kindly identified by Dr. J. W. Swaine, of the Department of Agriculture, Ottawa. Along the coast the most northern spruce-trees are represented by a scattered growth of perhaps 50, more or less dwarfed trees at the foot of the cliffs on the north-side of the entrance to Richmond Gulf, but a little inland in the same vicinity the growth becomes much more extensive, and the trees better developed.

Finally the Larch (*Larix americana*) extends as far north as the black spruce, though mainly in swamps and along the rivers, and the trees are surprisingly well developed, even at their northern limit. They generally grow more or less single, scattered among the black spruce, or flung out over the river-valleys and islands, so that the lovely shape of each tree and its delicate, light-green needles stand out. Unfortunately it is in the southern part of the peninsula almost totally destroyed by the ravages of the imported, European Saw-fly (*Nematus Erichsonii*), which seems to be spreading north and east-ward. Particularly the large trees are also attacked by bark-beetles (*Dendroctonus simplex*, etc.)

Fires From Careless Indians.

It may be said in general that no commercial timber occurs in Hudson Bay, and even in James Bay the lumber for the small

saw-mills found at Fort Albany, Moose Factory, and Rupert House, is cut some miles up the river each place. There is however any amount of trees suitable for spruce-deals, not to speak of pulp-wood, much farther north along the east coast of James Bay, but it should be remembered that the rivers here present many obstacles for transportation, and their upper reaches are largely unknown, except to a few Indians.

During the last fifty years or so, very extensive forest fires have destroyed almost half of the trees in the interior of the peninsula, springing up every summer, largely owing to carelessness on the part of the Indians making fire-signals or leaving camp fires behind. Much valuable timber has thus been destroyed, without anybody benefiting by it, the second growth of black spruce, jack pine, birch and aspen not being nearly so good as the first. There is no fire protection nor representatives of the provincial or federal governments in the whole area of James and Hudson Bays treated here.

A characteristic feature of the forests along the rivers and lakes up there is the dense undergrowth of shrubbery, composed mainly of willows, alders, viburnum, etc., with "Labrador Tea," "Laurel" and other smaller bushes in the open glades further into the woods. In the southern part these bushes also occur at higher elevation, above the tree-line, and are accompanied by the dwarf-birch on open places towards the north. Particularly in Hudson Bay, where the woods are more open, and often are found only on swampy places, the bottom between the trees is covered by a thick mat of *Sphagnum*-mosses, with at least as heavy a coating of reindeer-moss (*lichens*) on the open stretches. Beyond the limit of trees, in the northern part of the peninsula the shrubbery is made up almost exclusively of the arctic species of willows and birches, well developed on protected places, but dwarfed and with a prostrate growth where exposed to the wind.

While along the east side of James Bay the woods are practically continuous from near the beach inland, they become northward, in Hudson Bay, more and more scattered, and the trees are found mainly in "pockets" here and there. Of the larger islands in James Bay those centering around Charlton Island are heavily wooded, but the Twins and the smaller islands farther north have only a few, scattered and dwarfed