

eastern spruce. The maximum length would be about 6.7 mm. as against 5 mm. in the eastern species. The cellulose made from this wood should be very desirable for the manufacture of strong papers, providing it is not weakened in the process of conversion.

Western Hemlock, *Tsuga heterophylla*. This wood is found in British Columbia and the Pacific States, growing along with the other large trees of the country. It is somewhat heavier, harder and darker than the spruce, but it is superior in many ways to the Eastern Hemlock. This wood can be satisfactorily ground, but owing to the blackness occurring in some trees, its average color would be a disadvantage. It is non-resinous in character, however, and well adapted for the manufacture of sulphite fibre.

White, or Balsam, Fir, *Abies concolor*. This is used with the spruce for sulphite and ground wood, but, like the eastern woods, the balsam is the more resinous. Its wood is soft, coarse-grained, and compact. The summer bands are narrow and the color is from light brown to white. The gravity is 0.3638 and the ash 0.85 per cent. The fibre is almost as long as the tideland spruce.

Lowland, or white, Fir, *Abies grandis*. This is a large tree found all along the Pacific slope. It is hardly suitable for ground wood except in young trees, and then the resin content is a disadvantage. Owing to the broader summer bands, it is harder than the other woods described, but it has a long strong fibre, and will make excellent cellulose by any alkaline process.

Amabilis, or Red, Fir, *Abies amabilis*. This is another species of fir, which is found in the valleys of the Fraser and Columbia, and on the mountain sides. In the valleys it is a fairly large tree, but on the hillsides, it exists very largely as a scrub, with a very close-ringed growth. This scrub growth is very little use for anything except pulp, for a tree from 50 to 60 years old would have a diameter of about 6 inches. It contains about 1 per cent. of resin, which is about the same as the species of black spruce, which also grows as scrub in these mountain regions. The specific gravity is 0.4228 and ash 0.23. The color is not too dark for ground wood, and some day it will probably be used for that purpose, although it is rather too resinous for present requirements.

In the interior of British Columbia, there is another species of pine called the Bull Pine, *Pinus ponderosa*, which is a wood quite variable in character. This wood is supposed to be very resinous, but an average sample examined by the writer, was found to contain but 0.67 per cent. of resin, which is quite within the workable

limit. As scrub this is a faster-growing wood than the spruce, and it is somewhat surprising that it should be heavier in weight. The specific gravity of this wood will average 0.4715, and the ash 0.35.

To those interested in the study of woods from either their scientific or commercial aspect, it is a well recognized fact, that any species having a wide distribution, will, when growing under different influences of climate, soil, altitude, etc., show a considerable variation in its structure and physical characters. Any fixed data, therefore, although it may represent the results of a number of observations, can only be taken as a basis from which other specimens may be judged.

In the above descriptions it has been the writer's endeavor to show from the properties of the various woods, those attributes which are essential in any wood for the present requirements of pulp making.

The conditions of growth in a northern country seem to be best adapted for the development of those species which have a soft and non-resinous wood. Naturally these woods will be exploited and used in the production of pulp and paper, until the costs of working from this source are such as to allow the profitable working of the cheaper but more resistant woods.

The Brown-tail Moth in Canada.

The history of the Brown-tail Moth in Canada is briefly as follows:..

1902. Mr. Wm. McIntosh, of St. John, New Brunswick, took a single male specimen about twenty miles from St. John, N. B. Mr. G. Leavitt also took one.

1905. In July, Mr. John Russell took a specimen of the moth at Digby, Nova Scotia.

1907. A single winter web was received by the Division from Mr. C. P. Foote, Lakeville, King's County, Nova Scotia. Immediate investigation revealed the presence of several thousand webs in Annapolis and King's Counties.

1909. Winter webs containing living caterpillars were found in shipments of seedling nursery stock imported into Ontario, Quebec, and British Columbia, from France, as a result of the inspection of these shipments.

1910. A single egg mass received in August from St. Stephen, New Brunswick.

1911. Winter webs discovered at Pomeroy Ridge, Charlotte County, N.B., being conclusive evidence of the establishment of the insect in New Brunswick. The infestation in Nova Scotia also discovered to be greater.

—Report of Dominion Entomologist for 1911.