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CANADA'S WORK IN FOREST RESEARCH.*

MANY of the investigations now under way at the Forest Products Laboratories are intended only to cover the immediate problem before us, but others are designed to proceed until a knowledge of the basic principles of the subject is obtained. Such, we consider, is the most real purpose of our institution. The wood-using industries of our country are not of such size as to warrant their establishing individual laboratories of this kind, and if the Forest Products Laboratories of Canada can furnish to these industries scientifically accurate information concerning their materials and products and the manufacture of these products, then we of the laboratories will consider that we have not only earned our salaries, but that we have done our little bit to promote the industrial greatness of Canada.

A very brief mention of a few of the investigations which are now being carried on will suffice to show what we are attempting at present, though we are considerably handicapped by the absence of some of the best of our staff who are at the front and the impossibility of getting other suitable men at this time.

Some of the leading investigations now on hand are as follows:—

A comparative study of the mechanical strength and physical properties of all Canadian woods. Tests are made on a large number of small, clear specimens cut in the same way from several trees of each species selected in the forest by Forestry Branch experts. These tests are being made on the same system as a similar series of tests under way at the United States Forest Products Laboratory, so that our results will be directly comparable with theirs, and when both series are complete the data will cover all the North American woods.

A study of the comparative value and characteristics of mine timbers available for use in the coal mines of Nova Scotia. This includes strength tests and a study of the decay of such timbers, both in the mines and in storage. Already considerable improvement has been made in storage conditions so as to greatly decrease the loss from rotting in the piles.

A study of the fundamental factors involved in the drying of wood and phenomena related to change of moisture content, such as shrinkage, hygroscopicity, migration of moisture in the wood, heat conductivity, etc.

A study of methods looking for the utilization of waste sulphite liquor. About 600,000 tons of wood per year is consumed in the manufacture of sulphite pulp in Canada, and approximately one-half of that amount of organic material is thrown to waste in the liquor. The problem of finding a use for this material is a very complicated one, and, although a great deal of research has been done on the subject by various English, German and American chemists, only results of moderate value have been obtained. At present the work of these laboratories is confined to the compilation of all available information in connection with this subject, leaving experimental work to be done later on.

A study of the fundamental factors involved in the beating of paper pulp. This beating process is a very important one in the manufacture of paper, particularly

in the case of finer grades, and is one concerning which very little is known. A full understanding of the reactions involves a very complete knowledge of the colloidal characteristics of cellulose, thus leading to very involved questions of physical chemistry. This research is one of the type mentioned as being of so complicated a nature as to necessarily extend over several years, but is one which we are peculiarly well situated to attempt.

A study having for its object the discovery of a commercially feasible process of creosoting Jack pine and Eastern hemlock for use as railway ties.

An investigation as to the feasibility of chipping, drying and baling pulpwood for shipment and a determination of the value of chipped and dried wood as compared with round wood. There is a possibility that there may be a saving in freight effected which will make possible the utilization of forest areas which are now going to waste.

An investigation of the chemical composition of wood, particularly of those woods which may be of use for paper pulp. This work involves the testing and standardization of methods of analysis and the examination of the composition of several important species, both in the green condition and after different degrees of seasoning.

An investigation of the possibility of treating prairie grown woods so as to make possible their use as fence posts.

A study of the oils produced by the destructive distillation of wood, both resinous and hardwood, with reference to their use in ore flotation.

A study of the relative durabilities of Canadian woods when exposed to various kinds of wood-destroying fungi.

A study of the fibre dimensions of Canadian woods. This is particularly important to the paper industry, but is also of value in other work as well as being of considerable scientific interest.

A study of the sulphite cooking process and the factors involved in cooking various species of wood for pulp. It is hoped that a thorough study of the process from a scientific point of view combined with practical experience will point out ways in which the process can be improved.

The investigations mentioned do not include any but the outstanding problems. Besides these there is submitted to the Laboratories a continuous flow of minor questions which the laboratory equipment enables us to answer quite readily. Questions regarding the identification of wood from samples, for instance, are answered daily for people all over the country at no cost to them.

According to the statistical report of the Quebec Provincial Mines Branch, of the Department of Colonization, Mines and Fisheries, of which the Honorable Honore Mercier is Minister, the total value of the mineral production of the Province for 1916 is only one-half of 1 per cent. less than in 1913, the figures of which still constitute the highest record. The report also shows that the total value of the mineral production of the province for the year ending December 31, 1916, amounted to \$13,070,566, an increase of 14 per cent. as compared with the previous year. The main item in the list is asbestos, which figures for a value of \$5,182,905. Asbestos mines here produce about 90 per cent. of the world's supply. Other items which show very substantial increases are lead and zinc ores, chromite, magnesite, mica and molybdenite.

*Brief excerpts from an address by W. B. Campbell, Assistant Superintendent, Forest Products Laboratories, McGill University, Montreal. Delivered before the annual meeting of the Canadian Forestry Association.