wood identification, wood chemistry, and general wood utilization; they also co-operate with other Government Departments and industrial organizations in timber marketing problems. In addition, the Ottawa Laboratories carry out many investigations in connection with logging problems of the pulp and paper industry.

The Vancouver Laboratory devotes attention to special problems relating to Pacific Coast timbers which require local treatment and which cannot be carried out to advantage in the main laboratories on account of distance or for other reasons.

A research committee of the Canadian Lumbermen's Association was set up several years ago to effect liaison between the industry and the Laboratories and make as effective as possible the application of researches carried out by the Laboratories in the problems of the lumber industry.

Since the Laboratories were established, many advances have been made in the technique of wood utilization. Improvements have been made in treating railway ties, telephone poles, mining timbers, and other structural timbers with creosote, water-soluble salts, and other chemicals. This has enhanced the value of wood as a permanent structural material and permitted its use for a variety of purposes for which it is otherwise unsuitable. The work carried out in the treatment of hardwoods, especially birch, beech, and maple, has been of particular value. Reductions in the cost of manufacture of pulp and paper, and improvements in quality of products have resulted from researches of the Laboratories. Of particular interest has been the development in the Pulp and Paper Laboratory of the Canadian Standards Freeness Tester and the Johnston Fibre Classifier. Valuable work has also been carried out in the manufacture of groundwood pulp and in the pulping of resinous woods and hardwoods.

The study of the significance of discoloration in timber, as for example in jack pine, red cedar, and Douglas fir, has been responsible to a considerable degree in curtailing rejection of such material. Researches carried out in the spraying or dipping of timber, notably the sapwood of the pines, with chemicals which are toxic to wood-staining organisms have assisted in curtailing losses on this account, which in some years amounted to as high as one million dollars.

Through researches carried out in the Laboratories and at wood-working plants important advances have been made in seasoning both in the open air and in experimental dry-kilns. This work has been particularly valuable in both Eastern and Western Canada in connection with export markets which are becoming increasingly critical of specifications. The work carried out has been of significance to exporters of both softwoods and hardwoods.

Mechanical and physical tests have been carried out on nearly all important Canadian commercial species of timber according to practices which have been adopted by laboratories of countries of the British Empire and of the United States. A great deal of work has also been carried out on large structural timbers. This information has been widely used by Canadian engineers and by municipal authorities in the revision of building codes. It has also been made the basis for Canadian standard grades for all species of Canadian woods of structural importance which have been set up by the Canadian Engineering Standards Association. In logging operations in Canada a great deal of material such as limbs, small logs, defective logs, and species not ordinarily used commercially are left in the woods and wasted. At the sawmills quantities of bark, slabs, edgings, sawdust, and trim are consumed in refuse burners. The Laboratories are paying special attention to devising ways and means for curtailing this waste, and industry is becoming keenly aware of the