

of forest sites by the use of air photographs. Construction of suitable photogrammetric and other scientific apparatus include the forestry tri-camera method of air photography, which has been developed to provide maximum forestry information at minimum cost, and the shadow height calculator, constructed to facilitate the determination of tree heights from shadows in air photographs.

Research in forest economics includes studies and analyses of forest taxation (federal and provincial), land tenure and forest land valuation. A study of the economics of forest management has been carried out on a pulpwood limit in Quebec in order to develop a technique for evaluating the results that may be expected from a program of sustained-yield forest management.

**Forest-Products Research.**—Two Forest Products Laboratories conduct forest-products research, one at Ottawa, Ont., and the other at Vancouver, B.C. The purpose of this research is to supply the basic and practical knowledge required for the best possible utilization of Canada's forest resources and includes studies of the factors affecting the quality of wood and of manufactured wood products; the factors causing wood waste in logging and manufacturing; the mechanical, physical and chemical properties of wood and their relation to adaptability in use; the treatment of wood and its use in the manufacture of fibre products, alcohol, turpentine, etc.; new and more valuable uses for woods; and the application of laboratory findings to the standardization of lumber grades and the improvement of timber specifications in the building codes of Canadian cities. The Forest Products Laboratories co-operate with similar organizations in other countries, with the provinces and with industry.

The Pulp and Paper Research Institute of Canada at Montreal, Que., a corporation supported by the Federal Government, the Canadian Pulp and Paper Association and McGill University, carries out research in the field of pulps and papers. The program of work includes studies of the structure and properties of wood and bark and their chemical components; the improvement of pulping processes; studies for the improved utilization of waste products; and the improvement in the design of industrial equipment.

**Forest Biology.**—The Division of Forest Biology of the Science Service, Federal Department of Agriculture, undertakes investigations dealing with the biology and control of insects and diseases affecting forest and shade trees. The Zoology Unit maintains ten regional laboratories at strategic points across the country. The Forest Pathology Unit operates six branch laboratories. An insect disease laboratory was recently established at Sault Ste. Marie, Ont., for fundamental research on virus, fungi, and bacterial diseases of insects.

A special article dealing with Noxious Forest Insects and Their Control appears in the 1947 Year Book, pp. 389-400. A detailed account of the activities in forest pathology in Canada may be found in the 1948-49 Year Book, pp. 416-417.

## Section 6.—Forest Utilization

Forest utilization is concerned with the many industries employed in the hewing down of timber in the forest and its transformation into the numerous utilitarian shapes and forms required in modern living. The basic industries