

Three significant developments marked the work in building research during the year. A small Permafrost Research Station was established at Norman Wells, N.W.T., in co-operation with Imperial Oil Limited. A small laboratory was set up and the first field investigation carried out as the beginning of a long-term program of study of permafrost and of foundations on permafrost.

Work has been pressed forward on the revision of the National Building Code, this work being done by the Division for the Associate Committee on the National Building Code. Twenty-nine committees and panels have been at work involving the voluntary contributions of over 200 architects, engineers, contractors and others interested in building. All the technical and secretarial work for the Committee is done within the Division. Use of the new Code, when it becomes available, will promote still further the uniformity of building regulations across Canada.

The major effort in the Division of Radio and Electrical Engineering is now being devoted to defence problems, in which important advances have been realized. In non-secret work, a notable contribution has been made in the extension of the theory of slotted waveguide arrays which will result in smaller radar antennæ and clearer radar pictures.

The aeronautical facilities of NRC's Division of Mechanical Engineering serve the Royal Canadian Air Force and other government agencies concerned in military and defence production programs.

The wind tunnels of the Division were used to provide information in connection with the design of the de Havilland Otter aircraft which is now flying and is one of the most successful aircraft of its type. A high-speed wind tunnel was completed, installed and is now in operation; it is used primarily for the study of aircraft operation at speeds up to and in excess of the speed of sound.

The study of the icing of aircraft and engines and the development of means for their automatic protection has been continued both in the laboratory and in the air.

An interesting study has been made, in the hydraulics laboratory, of the Fraser River in British Columbia. A model of the river was built and river-flow conditions were established as a preliminary step in the investigation of silting conditions in the navigation channel. A larger model covering a longer section of the river has now been constructed and is in operation on a 3½-acre site on the campus of the University of British Columbia, where the climate permits open-air operation the year round.

In the 450-foot model-testing basin, models of lake freighters, ice breakers and other types of ships are tested, together with their propellers, for naval architects and shipbuilders.

In co-operation with engine manufacturers in the Maritimes, a small semi-diesel marine engine for fishing boats, together with a variable pitch propeller, was developed in the laboratories and three pilot models were built, one of which was given sea trials by a fisherman in Newfoundland. Two other units were made available to manufacturers.

The Prairie Regional Laboratory is devoted to the study of ways in which science can aid the prairie farmers in finding profitable industrial uses for waste or surplus products. An outstanding development was made this year in sugar chemistry using radioactive tracers, which led to a new synthesis of sugar derivatives.