

been constructed. The huts will be heated through the tunnel but exposed to all the rigours of the Prairie winter in order to determine the performance of different types of wall construction under actual climatic conditions.

A heat pump has been installed for demonstration purposes and for studying the economics of the use of a heat pump under Eastern Canada conditions. The Division co-operated with civic authorities in making a detailed study of vibration troubles caused by trolley buses operating in Winnipeg, Man. One member of the staff resident at Toronto, Ont., is attached to the staff of the Construction Engineer of the Toronto Transportation Commission as research engineer on the new subway where problems in construction and design may be studied on a full-scale basis.

Service to the Royal Canadian Air Force and to the Canadian aviation industry by the Council's aeronautical laboratories, Division of Mechanical Engineering, is being maintained at a high level. Much of the work done is on a co-operative basis and therefore highly effective.

Industry and the Royal Canadian Air Force have assisted in the development of modern high-speed aircraft. Using a Mustang aircraft, modified and equipped to function as a flying wind tunnel, models are being tested in the transonic speed range. A high-speed aerodynamic laboratory opened in June, 1950, marks a step forward in this field of research. Facilities are provided at Arnprior, Ont., for the flight-testing of aircraft. Vibration tests and the strength testing of full-scale aircraft components—wings, fuselage and empennage, can be made.

The investigation of icing and the protection of aircraft against this hazard has been continued. The protection of gas turbines (jets) from icing is being actively studied.

Tests have been made using dry ice to seed clouds of different types under a variety of conditions in an investigation of induced precipitation. A 30-mile stretch of the Fraser River and its delta is under investigation for possible improvement of the navigation channels and a scale model is under construction at the University of British Columbia.

Problems associated with the movement of logs in rivers, including the diversion of logs past power plants and the formation of log jams, are being studied.

Cold-weather research on fuels and lubricants is being carried out since the successful operation of mechanical equipment, such as motor-vehicles, aircraft, diesel-powered equipment and even diesel locomotives, at low temperatures, is directly dependent upon the use of suitable fuels and lubricants.

Radio problems in connection with aircraft are being studied in the Radio and Electrical Engineering Division. The very high speeds realized by jet-propelled aircraft have made it necessary to enclose all the antennæ within the flow lines of the aircraft, because the aerodynamic drag of an exterior antenna would be entirely too great.

Aids to navigation, both for marine use and in the air, are also being provided. Marine craft not equipped with radar frequently become uncertain of their position when navigational lights are obscured by heavy weather. An experimental system designed to meet this problem has been developed and tested with promising results.

A program of photographic, visual and radar observation of meteors is being carried on in collaboration with the Dominion Observatory, Ottawa, with the object of adding to the existing knowledge of meteors and of the upper atmosphere.