

A new suite of laboratories for paint research, a new sound chamber for studies of building acoustics and a new fire research building now under construction will extend the work of the Division.

Mechanical Engineering.—In addition to mechanical engineering, this Division embraces certain phases of hydraulic engineering and naval architecture and many branches of aeronautical engineering. The Division continues to work with the aircraft, shipbuilding, heavy engineering, chemical, and pulp and paper industries and to undertake work for government departments. It also functions as a source of supply of trained engineers and technicians for industry.

The Aerodynamics Section is devoted largely to classified defence projects. In particular, the low-speed and high-speed wind tunnels are engaged continuously on tests of models of several new aircraft under development by Canadian companies.

Work continued on several St. Lawrence Seaway projects to obtain design information in connection with navigation locks and river improvements. In the ship laboratory, the size of ships under study varied from naval escort vessels to small landing boats; problems included propeller design, vibration analysis, cooling water system analysis, and manoeuvring. Full-scale trials were carried out on a number of ships.

The major design effort of the Gas Dynamics Section was on a gas turbine unit suitable for railway traction. The engine laboratory had three principal projects: exhaust reheat of turbojet engines, anti-icing and cold tests of aircraft gas turbines, and improvement of test facilities. The main work of the low-temperature laboratory was directed to development of rotor de-icing equipment for helicopters. Projects of the fuels and lubricants laboratory included work on the evaporation of fuel sprays as applied to combustion of jet fuels, thermal stability of naval boiler fuels, and development of automotive brake fluids.

In the structures laboratory, the major effort was directed to the problem of swept wing aircraft flutter. Other fundamental work was done on the resistance of ship propellers to impact loading and on a design for airport beacon towers which could suffer decapitation without destroying the impacting aircraft. At the request of the Department of National Defence, the engineering laboratory developed and constructed an amphibious motor vehicle for safe travel on frozen lakes where thin patches of ice might not support the weight of an ordinary vehicle. The instruments laboratory designed and developed special instrumentation as required by other laboratories of the Division and, on occasion, by outside organizations.

Radio and Electrical Engineering.—About half of the Division's work consists of defence projects. The remainder of the program, on which information may be released, includes problems in electronics, radiophysics and electrical engineering. Where possible, emphasis is placed on applications of interest to Canadian industry. In the field of electronics the main projects include a remote fog-alarm control; a fog detection device; transistorized control of buoy lights; underwater television; location of crashed aircraft; etc. The motor vessel *Radel II* is an invaluable asset as a floating laboratory to test various radar devices and techniques. Electronic music is also a highly fruitful field of inquiry: a tape recorder has been designed especially for the production of new forms of music; an improved model of the electronic monophonic instrument, featuring improved pitch flexibility, is being built; development of the touch-sensitive organ is being continued.

The two sections of the Division most intimately connected with the International Geophysical Year are: upper atmosphere research which deals chiefly with observations of meteor showers; and the solar noise observatory where radio emissions from the sun have been observed daily for the tenth successive year.

Static electricity explosion hazards, instrument transformer calibration, high voltage research, dielectric research, and detection of flaws in paper are some of the projects in the electrical engineering field.