

to build and easy to install, which will soon be available to the public. Detailed studies, including construction of modular houses, are being made on standardization of dimensions in building design and materials, called "modular co-ordination".

Building materials research has involved the study of an unusual type of cement aggregate causing accelerated deterioration of concrete, investigations of brick and mortar, and the study of setting mechanisms of plaster. Other wide-scale studies under way include snow and wind loads on buildings; a study of avalanches along the route to be followed by the Trans-Canada Highway, which will also provide information on the mechanical properties of snow; laboratory studies on the strength of floating sheets of ice; and investigations concerning shallow foundations, houses on flat slabs, and problems of swelling and shrinking clay.

Mechanical Engineering.—The work of this Division lies mainly in the fields of mechanics, hydrodynamics (hydraulic engineering and naval architecture), aerodynamics and thermodynamics. Extensive work has been undertaken for a variety of industries and for government departments.

Demands for mechanical engineering research and development have continued, but with a number of important new trends. An extended series of tests for various aspects of the St. Lawrence Seaway has given place to new hydrodynamic investigations of both immediate and long-range application on problems of river and harbour improvement and optimum design of navigation locks and earth-fill dam spillways. Methods of improving paper-making machines gave rise to a laboratory study of the flow of pulp in pipelines to provide an analysis of the mechanics of flow. Towing tests, self-propulsion tests and flow studies were carried out on a variety of ship models, as well as full-scale sea trials and performance analyses of four types of ship.

Several laboratories have increased their theoretical and experimental work on problems of aircraft for short and vertical take-off. Such aircraft appear to be on the verge of practicability, and would prove extremely useful for transport in undeveloped parts of Canada and for certain military purposes.

Investigations continued on highly developed aircraft structures, control systems and engines. Work was begun on such subjects as fluid contamination and high speed gas flow; continuing projects include thrust boosting of jet engines by exhaust reheat, and anti-icing work on turbojet and turboprop engines and helicopter rotor blades.

Recent mechanics developments include the evolution of a suturing device and technique for joining severed blood vessels, and an automatic position indicator for crashed aircraft. The new medical technique was developed in collaboration with two surgeons. It is extremely satisfactory experimentally, even for small blood vessels, and should simplify the implanting of grafts replacing diseased sections of arteries. The crash position indicator, developed with the Radio and Electrical Engineering Division, automatically broadcasts distress signals for roughly a week following a crash and should enable more efficient and economical location of crashed aircraft and survivors. A special tide recorder was constructed for use in Arctic waters.

More advantageous use of Western Canada crude oils in diesel engines and gas turbines is under investigation. Other studies involve work on antifreezes; the detection of ethylene glycol in engine lubricants; and work on jet fuels, aviation gasolines, hydraulic oils and other petroleum products.

Radio and Electrical Engineering.—About half of the Division's work consists of defence projects; the remainder is devoted to fundamental research and engineering development in electronics, electrical engineering and radiophysics. Applications of interest to Canadian industry are given special attention.

Development of electronic aids to navigation continued, with devices such as a transistorized switch for buoy lights, and transistorized buoy flashers. Microwave equipment to provide accurate position-fixing for hydrographic vessels is being developed.