

While much of the research conducted with the new facility is fundamental in nature and relates to the properties of water under certain flow conditions, the tunnel is employed also to calibrate a variety of instruments and measuring devices used during oceanographic and allied studies.

The water tunnel, which parallels for ocean studies the data wind tunnels provide in aeronautical research, is expected also to facilitate the development of valuable data for the Royal Canadian Navy concerning submarine detection.

#### CIVIL DEFENCE

The Board continued to assist Canada's civil defence programme during 1956. Dr. E.E. Massey, a Defence Research Board staff member and scientific adviser to the civil defence authorities, directed tests in Ottawa last June using a powerful, radioactive Cobalt 60 source which indicated that travel in railway coaches through areas contaminated by atomic fallout would be relatively safe.

Brought to an Ottawa railway siding from Chalk River and enclosed within 300 pounds of lead, the source was suspended inside Canadian National Railways and Canadian Pacific Railways coaches by civil defence representatives. After the radio-active cobalt was exposed, scientists determined the geiger counter readings. Objective of the test was to determine the safeness or otherwise of railway cars for evacuation through radioactive areas.

Defence Research Board staff members were busy planning their contributions to Canada's 1957-58 International Geophysical Year (IGY) activities. Canadian Armament Research and Development Establishment scientists were integrated with a US Army rocket firing team at Fort Churchill that carried out a number of pre-IGY test firings at the northern Manitoba rocket site. Objectives will be the collection of data concerning the upper atmosphere.

The Defence Research Northern Laboratory (DRNL) at Fort Churchill, the Board's northernmost establishment, provided laboratory facilities and personnel helped the visiting US firing team with circuitry and allied problems.

Plans made during 1956 included preparations for an expedition to the Lake Hazen area of north Ellesmere Island during 1957 and 1958. In charge will be Dr. Geoffrey Hattersley-Smith, youthful glaciologist who has gained worldwide recognition for his discoveries relating to former expeditions in the Canadian Arctic.

Purpose of the expedition will be detailed glaciological, seismic, gravimetric and other geophysical and climatological studies on the ice cap north of Canada's northernmost lake. The parties will be supported logistically by the Canadian Army and the Royal Canadian Air Force.

Other disciplines in addition to glaciology in which DRB scientists completed plans during 1956 for active IGY participation are geomagnetism, ionospheric physics and solar activity. Several Board establishments arranged to make meteorological and other observations for the programme.

DRB scientists joined their Commonwealth associates early last year at meetings of the Commonwealth Advisory Committee on Defence Science to discuss collaboration throughout the British Commonwealth in the application of science to military affairs. The discussions took place in Ottawa, Toronto and Fort Churchill early in February.

About 50 Canadian operational research scientists, the majority DRB staff members, joined several hundred associates from Canada and the US at the first Canadian meeting of the Operations Research Society of America in Ottawa early last January. Their discussions centred on developments in the field of operational research, a scientific specialty created relatively recently which embraces combinations of a number of scientific fields.

At the Board's annual symposium, held each December in Ottawa, about 600 scientists and Service officers from Canada, the United Kingdom and the United States heard approximately 40 scientific papers presented by members of the DRB staff. Emphasis was on the atomic sciences with related papers dealing with a variety of other Canadian defence research activities.

The Board's annual symposium provide staff members and Canadian Service officers with detailed information on DRB activities. They promote exchanges of scientific information with the other two countries concerned and provide opportunities for Board scientists engaged in classified research to present and discuss their investigations.

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**OTTAWA CARILLON:** The carillon of the Peace Tower of the Parliament Buildings at Ottawa has 53 bells. The largest one weighs 22,400 pounds and is pitched to "E", while the smallest weighs 10 pounds and is pitched to "A", four and a half octaves above. The carillon was originally installed in 1927.

Robert Donnell, Dominion Carillonneur since 1939, has made more than 2,000 arrangements for the bells, as well as composing. Since carillons differ in the number of bells, all music must be specially arranged. Playing the carillon is a feat of strength as well as skill. The keyboard is six feet long and consists of peg-like keys forced down by the fist, and foot pedals are used for sounding the bass. Expression is given to the music through the variation of touch, and guards must be worn to protect the carillonneur's hands. Mr. Donnell trained as a carillonneur in Canada, the United States and Europe.