

DRB SCIENTISTS ACTIVE

The Defence Research Board's programme during 1957 shifted in emphasis from research leading to direct development to fundamental investigations. The newly-aligned studies were directed to support United Kingdom and United States ballistic missile defence activities, and expanded weapons and defence systems evaluations.

Working closely with scientists from the other two countries, DRB staff members increased and accelerated scientific effort related to the development of a defence against intercontinental ballistic missiles (ICBMs). The programme involves studies of a scale model ICBM passing through a simulated atmosphere, research in upper atmospheric physics, infrared detection and guidance, and the development of new propellants for large rockets.

To assist in obtaining vital scientific information about the upper atmosphere, the Board and the United States Air Force are beginning construction of a large radar installation near Prince Albert. Aimed at studying the aurora borealis (northern lights) and its likely effects upon ICBM detection, the joint project will begin this summer. Staff members of the University of Saskatchewan's Institute of Upper Atmospheric Physics will collaborate with the defence scientists.

Scientific advances related to military operations that have developed so rapidly during the past few years have dictated that Canada choose new defensive weapons in the near future. For this reason, DRB operational research specialists increased their efforts in the field of systems evaluations during the past 12-month period. These careful assessments, detailed examinations of the variables involving the different parts of defence and weapons' systems, aim at ensuring the comparability both of the system's component parts and of the individuals operating them.

The approaching need for interlocking anti-bomber and ballistic missile defences has necessitated intensification of these allied studies.

Also under consideration by the operational research scientists is the problem of missile-armed, long-range submarines. Because of the ranges now possible by guided weapons, Canadian and allied scientists are exploring practical methods of developing effective barriers to keep enemy submarines and surface ships well beyond our coasts during wartime.

The position of Vice Chairman of the Board, vacant since Dr. A.H. Zimmerman assumed the Chairmanship in 1956, was filled last April with the appointment of Dr. John E. Keyston, for the past seven years Chief Superintendent of the Naval Research Establishment (NRE) at Dartmouth, N.S.

An eminent scientist who has gained re-

cognition for his research both in industrial and defence scientific fields, Dr. Keyston led NRE to a number of advances of particular military importance. Under his leadership, the laboratory developed submarine detection equipment with outstanding characteristics and significantly efficient methods of protecting ships' hulls from corrosion. The latter scientific procedures result in appreciable annual maintenance savings for the Royal Canadian Navy.

The Board released details relating to a number of interesting activities during the past 12-month period.

Advanced scientific investigations of hydrofoil craft were made possible late in April with the launching in the United Kingdom of "Bras d'Or", a larger and more extensively instrumented successor to "Massawippi", the Board's first hydrofoil craft.

Of aluminum alloy construction, the 59-foot, 17½-ton craft is fitted with three hydrofoil units of similar size. Two are mounted on each side of the hull near the bow and the third, which serves also as a rudder, is fixed to the stern. Because hull drag is reduced or even eliminated as the craft rises on its foils, unusually high speeds become possible.

Trials began late in the autumn in Halifax harbour and will be conducted for an indefinite period by NRE scientists.

Following the launching of Sputnik I by the USSR early in October, Defence Research Telecommunications Establishment (DRTE) scientists, working closely with the National Research Council, were believed the first in the Western World to determine accurately the satellite's orbit and to fix its position in space. They calculated its speed and obtained other useful information which checked closely with the scientific data released subsequently by the Soviet Union.

The same group of scientists, in association with NRC, The Dominion Observatory and the Department of Transport, contributed similar information concerning Sputnik II and its carrier rocket. The measurements and calculations were forwarded to the appropriate International Geophysical Year (IGY) committee in each case.

DRTE scientists used the moon as a radio wave reflector during 1957 while studying ionospheric characteristics which affect long range telecommunications. In bouncing radio signals off the moon's surface, a television-type transmitter with an antenna 28 feet in diameter was employed. The information obtained from the project provided data for the Board's ballistic missile defence programme as well as for its telecommunications activities.

DRB announced the development of a new radar navigational aid for aircraft called "DAGMAR" early in 1957. A light-weight, low-