

In 1966 a special study was commissioned by the Science Secretariat of the Federal Government to review the existing Canadian programs in space science, to determine the reasons for a space program in Canada, to forecast future programs and to outline the elements of a suitable organization. This study, known as the Chapman Report, was published in March 1967 and led to the formation in July 1967 of a Task Force on Satellites which will make recommendations to the Government on the scope and nature of Canada's future activities in the use of satellites, including satellite communications, and will fully explore avenues for co-operation with United States, European and other interests in this field.

#### Section 4.—Research in Geophysics and Astronomy

Research in the field of geophysics is covered in the 1967 Year Book under the heading of Geology and Economic Minerals of Canada, pp. 30-32. The following item on this subject gives brief additional data on current (1967) projects and facilities. A special article on Astronomy in Canada, appearing in the 1965 Year Book at pp. 47-55, indicates in some detail the advances made in astronomical research and educational facilities; the write-up on pp. 420-421 mentions the highlights only.

**Geophysics.\***—Geophysics—the study of the earth, including the oceans and atmosphere, by the methods of physics—embraces a number of fields, each a major science in itself, such as geodesy, seismology, terrestrial magnetism, meteorology, oceanography and hydrology. Work in geophysics in Canada is carried on by a number of Federal Government departments, some provincial governments, nearly all universities and by companies engaged in geophysical prospecting for oil or minerals.

Currently, in the field of seismology, the 25 seismograph stations operated by the Dominion Observatory, with the co-operation of universities in several cases, provide good coverage of the country for the recording of earthquakes. The regular stations are supplemented by a special array of detectors at Yellowknife, N.W.T., which is operated by the Dominion Observatory as part of a world net of highly sensitive detection stations for nuclear explosions. Because of interest in seismicity as applied to building problems, special strong-motion instruments have been installed on the West Coast and, in co-operation with the Division of Building Research of the National Research Council, at Sept Îles, Que. Considerable work has also been done by both government and university groups on the study of the earth's crust, using waves from explosions.

Measurements of both the gravitational and magnetic fields of the earth were extended during 1966-67 over land areas by the Dominion Observatory and the Geological Survey, and over the oceans by the Bedford Institute of Oceanography. These measurements provide information that is extremely useful in the study of concealed geological structures. A very large area of Canada has now been covered by airborne magnetometer maps (partly through co-operative federal-provincial surveys); in many regions, these maps have come to be an essential item of equipment for the prospector. Because the north magnetic pole is located in Canada, studies of magnetic disturbances and their relation to conditions in the upper atmosphere are of importance in Canadian geophysical research. Observations by means of rockets were made at the Churchill Research Range in northern Manitoba and also, for the first time, with rockets fired from Resolute Bay, N.W.T. Satellite *Alouette I* launched in 1962 and *Alouette II* launched in 1965 continue to provide information on the ionosphere. (See also p. 418.)

The Canadian program for the International Hydrological Decade, a ten-year study of the world's freshwater resources, has been developed in detail. Experimental basins across the country have been selected for the observation of the effects of changes in surface features on the amount and quality of groundwater. A feature of the Canadian program in hydrology is the importance of glacier studies. During the year, expeditions

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