

detect local earthquakes in virtually any part of Canada, and also to constitute a major contribution to the international study of earthquakes on a world-wide scale. Studies of the earth's crust using the waves from artificial explosions were carried out in several places. An extensive program, conducted by government and university scientists in co-operation with groups from the United States, involved the detection of waves from charges placed on the bottom of Lake Superior. The results of this program, when the calculations have been completed, should provide one of the most detailed pictures of the geological nature of the earth's crust ever achieved. Other crustal studies were conducted in the Canadian Arctic by the Polar Continental Shelf group of the Department of Mines and Technical Surveys, and in British Columbia, Alberta, Manitoba and Nova Scotia by universities.

The study of the earth's atmosphere (meteorology) involves the Meteorological Branch, Department of Transport, and university groups such as the Department of Meteorology, McGill University, and the Department of Physics, University of Toronto. The forecasting operations of the Meteorological Branch are well-known, but important research is also carried out. This research involves the use of modern measuring equipment, such as radar, and also high-speed computing techniques. Canada has areas in which particular meteorological conditions constitute serious problems. One of these is the hail belt of the western prairies, and groups from McGill University, the University of Toronto and the Alberta Research Council are investigating the causes of hail storms and the possibilities of weather modification.

In many parts of the world, the supply of fresh water has become a critical problem. Canada is relatively well supplied with this natural resource, but in some areas of the country the supply must be carefully watched. Many groups from federal and provincial government departments are concerned with hydrology, which is the study of the earth's fresh waters. The Water Resources Branch, Department of Northern Affairs and National Resources, conducts a survey of water resources on a national scale. Other groups study the water cycle, including precipitation, snowmelt, runoff and groundwater movements, in local watersheds. The Geological Survey of Canada and some provincial agencies are studying seismological and other geophysical methods of locating buried stream channels. In view of the extensive work in hydrology in progress, it is appropriate that Canadian hydrologists have made plans to participate in the International Hydrological Decade, a ten-year study of the world's resources of water.

The study of glaciers is rather closely related to hydrology, since glacial ice is one form in which water is available as a natural resource. In addition, glaciers are very sensitive indicators of climate, and measurements of glacial advances and retreats provide information on climatic change. The Geographical Branch, Department of Mines and Technical Surveys, is preparing an inventory of Canadian glaciers, based chiefly on aerial photographs. Investigations in the field were conducted in recent seasons in the Rocky Mountains, Monashee Mountains and Icefield Ranges of Western Canada; in central Labrador; and on Baffin Island and the Queen Elizabeth Islands of the Canadian Arctic. Field work includes geophysical measurements of ice thickness, precise surveys to determine the rate of ice flow, and measurements of accumulation and melting. The Defence Research Board established a field station at the head of Tanquary Fiord (latitude 81°25'N, longitude 76°55'W) for its studies of northern Ellesmere Island.

Measurements of the earth's magnetic field, and of its changes with time, are important for a number of reasons. In earlier years, the use of the magnetic compass for navigation required accurate measurements of the declination. This is still a consideration but more important today is the use of magnetic measurements for detection of mineral deposits, and the study of changes in the magnetic field produced by charged particles from the sun. The general mapping of the earth's magnetism over Canada by both ground and airborne measurements is the responsibility of the Dominion Observatory. The Geological Survey of Canada, in part with the co-operation of provincial governments, conducts airborne magnetic surveys for geological purposes, including the indication of favourable areas for prospectors. During 1963, the Survey produced 140 sheets of aeromagnetic maps (scale