A problem that received particular attention was that of hail formation, since hail damage to crops can be extremely serious in certain areas and there is considerable interest in the possibility of forecasting or even preventing it.

Geophysical exploration for oil, chiefly by means of seismic waves from small explosions, was carried on by several companies in Western Canada and also offshore in the Pacific and in the Atlantic Grand Banks area. Prospecting for minerals by magnetic or electro-magnetic measurements was intensified as a result of the demand for copper. The recent large copper discovery near Timmins, Ont., was made on the basis of geophysical surveys.

Astronomy.*—Modern astronomical research is based on observations secured with complex optical and radio telescopes. The major centres of this research in Canada have developed within the Federal Government and at a few universities. Research in optical astronomy began early in this century at the Dominion Observatory, Ottawa, and this was followed by the construction of larger telescopes at the Dominion Astrophysical Observatory, Victoria, and the David Dunlap Observatory of the University of Toronto. Smaller observatories have also been built at the University of Western Ontario and at Queen's University. A new observatory, commemorating the visit of Her Majesty Queen Elizabeth II to Canada in October 1964, is to be constructed on Mount Kobau in southern British Columbia. It will be equipped with a large reflecting telescope 150 inches in diameter and will be a national observatory available to astronomers throughout the country.

Canada first entered the field of radio astronomy, the study of radio emissions from beyond the earth, in 1946 when the National Research Council began its study of solar radio waves. Radio astronomy has expanded rapidly and there are now radio telescopes operated by the University of Toronto, by Queen's University, by the Dominion Observatory near Penticton, B.C., and by the National Research Council at a large observatory in Algonquin Park, Ont., where a large steerable radio telescope 150 feet in diameter will commence observations in 1966. An 84-foot parabolic telescope and two large arrays of antennas are in operation at the Penticton site.

Canadian astronomers are engaged in various specialized fields of research. In the study of the solar system the sun has been studied for many years by both optical and radio techniques with emphasis on solar flares and other phenomena which affect the environment of the earth. Solar eclipses in which the path of totality crosses Canada have been observed whenever possible. Only minor attention has been devoted to study of the planets but major efforts have gone into meteor research. Both photographic and radar equipment are employed in this work and the study of meteor spectra and radar echoes from meteor trails have been particular specialties. There is an increasing interest in the related field of meteorites and Canada has figured prominently in the study and interpretation of old craters caused by the impact of huge meteorites.

Stellar astronomy has been the largest single field of Canadian astronomy. One aspect of this is the accurate determination of the positions and motions of stars in the sky. The Dominion Observatory is continuing an active program of positional astronomy aided by new and highly specialized instruments. The large telescopes at Victoria and Toronto have been used primarily for spectroscopy, one of the major tools of astrophysics. Several programs have been completed in which large groups of stars have been studied individually to determine their true luminosities and motions in the line of sight. The results have then been used for research on the structure of the earth's Milky Way galaxy. From spectroscopic studies of certain types of close double stars, information on such properties as the size, mass, density and temperature of individual stars is secured. Stars whose light varies in intensity have been studied by photography for many clusters of stars and are also studied by photoelectric devices mounted on the telescopes at Victoria, Toronto and the University of Western Ontario.

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