periods of high probability of magnetic or ionospheric storms can be predicted by close observation of the sun. To watch it continuously, observatories scattered around the world must be in regular communication with the predicting and world-warning centre at Fort Belvoir, near Washington, D.C. The organizing of communications to the predicting centre and from it to all the stations needing the warning was no small task. When a disturbance is likely, an alert is announced followed by a special world interval of concerted study if the disturbance appears to justify it.

Everyone is familiar with problems in weather forecasting and, despite facetious remarks about the weather man, a knowledge of *Meteorology* is essential to air transport and to many industries. Meteorology is therefore a very dominant discipline in the IGY. The emphasis in the international program is on world-wide circulation of air and on a greater knowledge of the radiation budget or the exchange of energy between the earth and its atmosphere and between the earth and its atmosphere as a unit and the sun and sky. More extensive measurements in polar areas are important. The Canadian program involves enhanced observations at practically all the meteorological stations where balloon-borne radiosondes are sent up daily. The IGY list includes 46 such stations scattered fairly uniformly over all Canadian territory. Special radiation measurements are being taken at about 10 of the 46 stations and a detailed study of Arctic micrometeorology is being made at Resolute in the far Arctic.

The important features of *Geomagnetism, the Aurora and Air Glow, Ionosphere Physics,* and *Solar Activity* can be discussed together. Clouds of particles and electromagnetic radiation are shot out in irregular bursts from the sun. The light and heat received from the sun is, on the whole, very steady but when the effects of ultra-violet light, X-rays and these clouds or beams of electrons and ionized atomic particles are examined they are found to be quite variable and the variability follows the well-known eleven-year cycle of sun-spot activity. The period 1957-58 was chosen for the IGY partly because it was expected to coincide with a maximum in solar activity.

Aurora occur more frequently during such periods than when the sun is quiet and abnormal ionospheric conditions are frequent at the same time. The ionosphere consists of reflecting layers of high electrical conductivity at heights between 50 and 200 miles in the atmosphere. It is of great commercial importance because most long-range radio communications depend on the reflection of radio waves from the various layers in the ionosphere. These layers vary in height and in electron density in regular ways with seasonal and diurnal periods, and with changes in solar activity, but superimposed on them are large fluctuations, very high ionospheric winds and the flow of electric currents high up in the atmosphere. The flow of electric currents represented by the motion of charged particles (which also cause the aurora) is influenced strongly by the earth's magnetic field and, in turn, distorts the earth's magnetic field causing the well-known magnetic storms.

An elaborate series of measurements, taken simultaneously, on the earth's magnetic field, on the occurrence, position and type of aurora, and on the ionosphere will give data from which much more may be learned about these phenomena which are important commercially as well as scientifically. To carry out the Canadian share of the observations, stations were established according to a plan to observe the aurora, the geomagnetic field and the ionosphere. The aurora belt or band of maximum frequency is roughly a circle of about 20° co-latitude from the geomagnetic pole. Churchill, Man., is in the centre of this band and a chain of stations north and south from Churchill was chosen. This chain starts at Alert (the most northerly part of Canada about 500 miles from the North Pole) and extends south to Winnipeg. In addition to Alert and Winnipeg, it includes Resolute, Baker Lake, Ennadai Lake, Churchill, Bird, and The Pas. Another chain extends westward and includes Yellowknife, N.W.T., Meanook, Alta., and Victoria, B.C. Saskatoon, Sask., is also an important centre for the measurement of these upper-atmosphere phenomena.