must indicate whether or not direct contact will be possible, the frequencies to be used if the possibility is good, or the practicality of resorting to alternate "radio routes" for vital communications.

One of the most important aspects of ionospheric research is that planned for the Antarctic. Soundings of the ionosphere have never before been made in this region where the sun is absent during the long winter months. Radiation from the sun is known to be the principal agent in breaking up the sparse atoms in the atmosphere at ionospheric heights so that reflection of radio waves is possible. During the long Antarctic night however, particularly at the South Pole, the sun's radiation is absent. Scientists have no good explanation to account for the continued existence of ionized regions in the high atmosphere under these conditions, and eagerly await the chance to study the composition and characteristics of the ionosphere in this unique situation. The opportunity to make continuous ionospheric soundings over a prolonged period in Antarctica under these conditions offers the promise of contributing valuable new information to expand the scientific theories.

At the present time there are about 75 vertical incidence ionospheric sounding stations in operation around the world. About an equal number will be established during the IGY in order to fill the gaps in the observing network. With the information received from this expanded chain of stations, we can confidently expect that far more accurate predictions can be made concerning the behavior of the ionosphere and its usefulness in long-distance radio communications.

The United States now operates or supports 17 stations within the regions of its own national interests. During the IGY it will be responsible for the establishment of 17 additional stations. Several stations will be established in the Antarctic and two in the Arctic, the latter at Thule, Greenland, and at a sea-ice location north of Alaska. In addition, stations will be established at St. Johns, Newfoundland, Florida, and in the Pacific. Four stations will be established cooperatively with South American countries in order to complete the coverage of the 70° to 80° longitude chain. An intensified research program will be undertaken along the west coast of South America in the region of the geomagnetic equator, since very unusual and unexplained effects of vital importance to radio communications occur about this equator.

AURORA AND AIRGLOW

The bombardment of the earth's atmosphere by charged particles streaming from the sun gives rise to the visible electrical rays and sheets of the aurora. The aurora is actually the luminous trace of these particles in the atmosphere. As these particles approach the earth, they are deflected by the earth's magnetic field toward the geomagnetic poles. Thus they penetrate the atmosphere at high latitudes and excite the gases in the air. When the atmospheric atoms return to their normal, unexcited state, they release energy, producing the distinctive lights and colors of the aurora.

At all times a weak glow of light is shed down from the sky, and scientists measuring its characteristics have found that it is probably not caused by particles coming from outer space and exciting atmospheric atoms to produce light, as the aurora is. Although this glow, called airglow, resembles at its brightest a faint aurora, scientists be-