

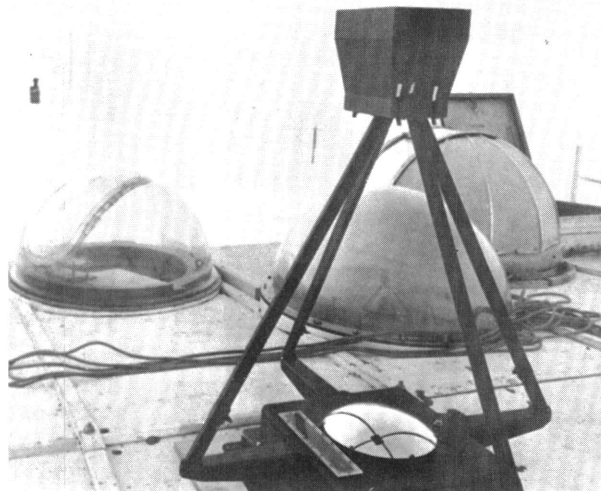
Antarctic Aurora Program, 1965-1966

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The Arctic Institute currently operates auroral recording equipment at Byrd and Plateau Stations. All-sky cameras, auroral spectrographs, and photometers are used. Auroral events of special interest are photographed on several types of high-speed color film with 35-mm. cameras. The observations at Byrd are synchronized with identical ones at this station's conjugate in the Northern Hemisphere, Great Whale River. The data obtained enables better determination of the zone of maximum occurrence of aurora, permit investigation of the simultaneity of auroral parameters at geomagnetically conjugate points and the correlation of aurora with other geophysical phenomena, and provides information on the upper atmosphere. At Byrd Station, two new Canadian all-sky cameras and a five-channel photometer were installed for the 1966 studies. A like set of instruments is operating at Great Whale River.

During the winter of 1965, the Institute conducted programs at South Pole, Byrd, and Eight Stations. When the latter station was closed, the auroral equipment was transferred to Plateau Station. An interesting dividend of the program at South Pole was the recording of a polar satellite passage on the all-sky camera.

Two former Institute observers are presently studying the relationship of aurora to other geophysical phenomena observed at South Pole Station.



(Photo: Lawrence Spitz)
Canadian All-Sky Camera on the Roof of the Aurora Tower at Byrd Station.

Scanning Spectrometer at the South Pole

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This equipment was installed in January 1966 to study the distribution of sodium and the spectral distribution of polar-cap-glow aurora. The first observing period, March 31—April 15, had completely clear skies and the equipment worked well. Ten hours of data, taken on April 6 and radioed to Boulder, have been reduced and plotted. Sodium emission has been recorded very satisfactorily, with good intensity and resolution.

Vertical Incidence Ionosphere Sounding Program

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Electron densities at various heights to 700 kilometers have been recorded at Byrd and South Pole Stations since 1957. The measurements, obtained at intervals of 15 minutes, show the characteristics of the reflecting levels of ionization above each station. The sounder transmits short pulses of energy upward toward the ionosphere and receives the reflected energy during an observing period of 30 seconds. The operating frequency of the instrument is changed continuously during the observing period, from 0.25 to 20 mc./s., while the data are recorded on 35-millimeter film.

At Pole Station, the principal ionizing agent, direct rays from the sun, is absent from the ionosphere for several weeks each year. The ionosphere continues to exhibit a diurnal variation, however, during this period. The data collected have made possible improvements in the accuracy of long-term (six months) predictions of radio propagation conditions in Antarctica and elsewhere in the Southern Hemisphere.

Another upper atmosphere project of the U.S. Antarctic Research Program active during the past year was:

VLF Observations at Vostok, 1965. Dartmouth College; Leif Owren, Principal Investigator.