

GEOPHYSICS

Report First IGY Results

Reports on the first five months' research conducted during the International Geophysical Year indicate many advances have been made in our understanding of the earth.

See Front Cover

► MANY IMPORTANT discoveries in various scientific fields have been made in the first six months of the 18-month International Geophysical Year, or IGY, which ends Dec. 31, 1958.

Early results of the U. S. IGY program are reported by Hugh Odishaw, executive director of the U. S. National Committee for IGY, in *Science* (Jan. 17).

The first findings from the international research program probing earth and its environment reflect the work of hundreds of scientists. (See SNL, June 8, 1957, p. 362.)

Results range from the recovery of a living organism from the record ocean depth of 16,200 feet to the discovery that there may be an atmosphere all the way from earth to the sun, consisting largely of hydrogen particles emitted by the sun.

Among the other findings reported by Mr. Odishaw:

From levels more than 1,000 feet below the surface of Greenland's ice cap, ice cores carrying a record of earth's climate for 2,000 years have been recovered.

Upper atmospheric studies with the aid of rockets have confirmed that blackouts of shortwave radio reception are caused by an "extra" layer of ionized air extending for about 12 miles below the normal lowest point and resulting from X-rays emitted by the sun during solar flares. The D, or lowest, ionospheric layer appears to remain undisturbed during the blackout.

The photograph on the cover of this week's SCIENCE NEWS LETTER shows the first IGY scanning photoelectric photometer, situated on top of Fritz Peak, Colo. This instrument selects and measures the intensity of airglow, light too faint for the human eye, and records its changes by converting the light into electric signals.

Radio noise at very low frequencies is thought to result from solar particles arriving in the very high atmosphere, there transferring their energy to very low frequency radio signals.

By flying and sailing instruments around the world, the earth's cosmic ray equator has been found to depart considerably from the geomagnetic equator, indicating important magnetic fields in space that deflect incoming cosmic rays. Cosmic ray measurements at a constant altitude can detect changes of latitude as small as seven miles.

Certain waves generated by earthquakes with periods of about 100 seconds, previously known only in the earth's crust, have now been identified with the next lower layer. Studies of how these waves propagate will provide new information on the

distribution of materials in the earth's interior.

Exploring the structure of the Andes Mountains in South America, seismologists have found roots of unsuspected depths. By comparison, the roots under the Rocky Mountains were found unexpectedly shallow.

Scientists drifting on an ice floe only a few hundred miles from the North Pole discovered that about 12 inches of ice on the upper surface melted away, while as much as 18 to 24 inches of new ice formed on the bottom during the past summer season.

Operation of Antarctic Weather Central at Little America Station has permitted an international group of scientists to prepare the first synoptic weather charts on a daily basis. Weather forecasting in the Southern Hemisphere has already improved markedly because of the charts.

In spite of the months-long absence of sunlight, the electron concentration in the ionosphere seems to remain very high throughout the polar night, with a daily variation that is associated with geomagnetic activity.

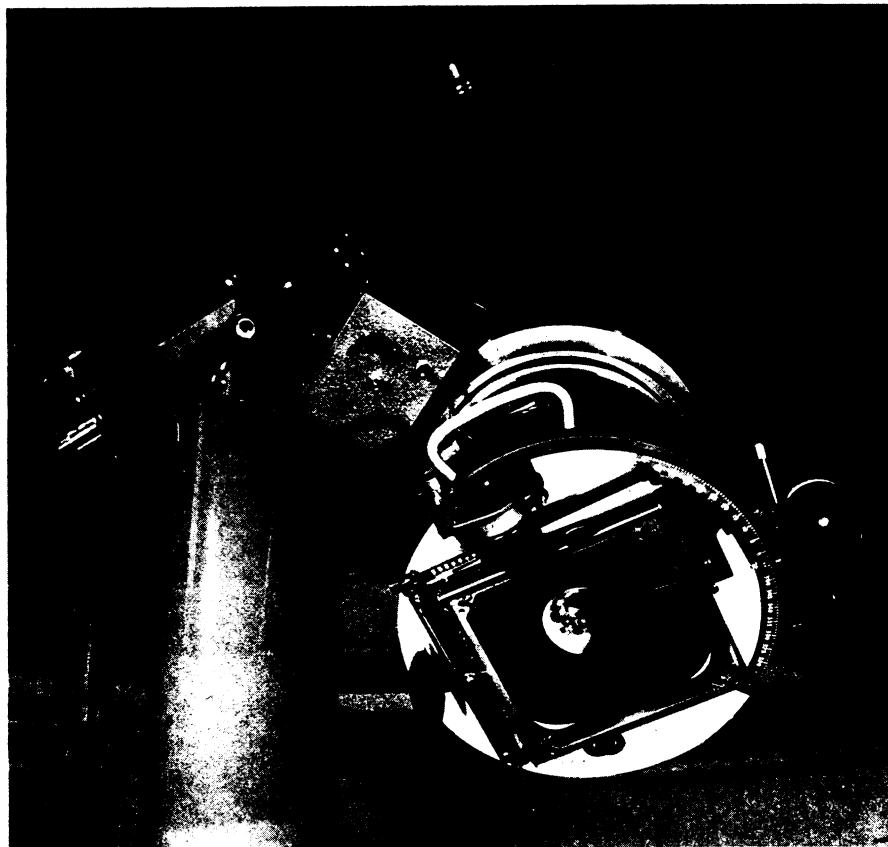
Ozone, the triple weight form of oxygen forming a minor constituent of air, is about 25% more plentiful at Little America than in New Mexico. Because of the energy it can absorb and release, ozone is thought to play an important role in the circulation of the high atmosphere.

Another air chemical, carbon dioxide, believed to have a major role in climate changes because of its ability to act like a trap for heat radiation, occurs in about the same concentration over the Antarctic as it does in regions closer to immediate industrial contamination.

Pronounced changes in the amount of oxygen dissolved in the southern Atlantic Ocean have occurred during the past 30 years, suggesting that the deep bottom water so rich in food for fish is not being formed as fast now as it was in the past.

In the Arctic Basin where oceanographers work from camps on the frozen ocean, the track of one station carried observers over what appears to be a newly discovered underwater mountain chain.

Science News Letter, January 25, 1958



DUAL-RATE CAMERA—The dual-rate moon position camera and telescope is designed to photograph the moon and surrounding stars simultaneously. This photograph is composite, showing how the moon appears through the dark filter at the center which tilts during exposures. Photographs thus obtained fix the moon's position with respect to the stellar background, yielding precise determinations of the earth's longitudes and latitudes, free of distortion caused by gravity. (See SNL, June 22, 1957, p. 390.)