genus within the 4th family, and the 1st species within the 10th genus. The code is quite flexible, and, when proper expansion is provided for, the system will allow for coding of an almost infinite number of entities.

Conclusion

The State Plant Board of Florida has adopted an open-ended code for coding biological entities. The system permits the coding of quantitative and qualitative data and the sorting by machine of mass data with a high degree of accuracy. Although the form used by the Plant Board is designed primarily for surveys, the coding by other organizations of animals and plants should be made uniform to increase the usefulness of the code on a world-wide basis, regardless of the form used. Uniform coding can be accomplished best through a central clearinghouse.

On casual consideration this system may appear to be expensive and complicated. Actually, however, the coding procedure is relatively simple. Careful examination of the total cost of cataloging, extracting, and analyzing data and the comparative ease of performing the operations that are described in this article shows the system to be economical.

If the idea of standardizing is accepted by biologists, it might result in our being able to compare results better and in expediting the obtaining of information pertaining to such subjects as life histories, populations, and distribution.

Note

1. Dr. Wood is head of the Biology Group of the Chemical-Biological Coordination Center, Washington, D.C.

News of Science

Antarctic Research Program at U.S. Stations Resumes after Polar Winter

The onset of the antarctic spring signaled the resumption of a heavy schedule of International Geophysical Year scientific activities in Antarctica. After long months of polar darkness, the 70 scientists who wintered over at the seven United States IGY stations have accelerated work in a broad range of geophysical missions. Many of them have moved from winter quarters into the field.

Study Subjects

Antarctica's structure beneath its thick coating of ice, the frigid region's effect on world weather and climate, its influence on global communications, its geologic history and geophysical future, are among the subjects in the scientific study of this vast land area. The all-out scientific effort also includes accumulation of significant data on aurora and airglow, cosmic rays, geomagnetism, glaciology, gravity, ionospheric physics, meteorology, and seismology. Shipboard rocketry experiments and oceanographic research, as well as special station studies in botany, zoology, and microbiology, will be conducted.

Traverses

Much of the scientific information to be collected by U.S. scientists in the coming season as the IGY nears its end will be gathered on a series of major oversnow traverses (see map on page 993). The surface traverse parties, moving in tractors fitted with electronic apparatus for detection of crevasses, will conduct seismic, glaciological, and other geophysical studies. One traverse departed from Little America Station about 15 October in an attempt to cross the Ross Ice Shelf to the top of the Skelton Glacier and continue to Victoria Land Plateau. Another traverse will start 1 November from Byrd Station in Marie Byrd Land, covering the territory between the station and the Horlick Mountains, skirting the northern edge of the Horlick Mountain Range for a distance of 200 to 300 miles, and then returning to Byrd Station. A third traverse will pick up from Ellsworth Station, near the Weddell Sea coast, and continue on to Byrd Station. The traverse parties use seismic techniques to measure ice thickness and to determine the character of the subglacial floor and of exposed land areas.

Besides the oversnow treks, an airborne traverse is planned. This will follow a course running southward from Mount Waesche to the northern edge of the Horlick Mountains. The study group, traveling in ski-equipped planes, will land at 50-mile intervals for seismographic soundings probing the depth of the antarctic ice sheet. It will also engage in gravity observations and glaciological work.

Personnel

Scientific leaders at the U.S. IGY antarctic stations are: Little America Station, Albert P. Crary; Byrd Station, Stephen S. Barnes; Wilkes Station, Willis L. Tressler; Ellsworth Station, Matthew J. Brennan. At Hallett Station, a joint United States–New Zealand undertaking, the scientific leader is a New Zealander, K. J. Salmon. Recently, the study group which wintered over at the various stations was augmented by some 70 additional colleagues who were transported to Antarctica for summer-season research. Some of the newcomers will remain for the next winter, relieving current IGY personnel.

Past Work

IGY scientists in Antarctica have already collected much significant information:

Seismic measurements of ice thickness indicate that there is probably 40 percent more ice in Antarctica than was previously thought. Scientists from the Byrd Station, for example, measured ice 14,000 feet thick, resting on bedrock 8200 feet below sea level; this may be the thickest ice measured anywhere in the world.

The antarctic ice covering is estimated to have been, at one time, as much as 1000 feet thicker than it is now. Not yet known, however, is whether the total ice mass is presently increasing or decreasing.

A record low temperature of – 125.3°F was reported by Soviet scientists at an IGY station near the center of Antarctica. At the South Pole itself, U.S. IGY radiation studies have shown that during the antarctic midsummer the pole receives more sunlight than any other

place on earth. But up to 95 percent of this radiation is reflected by the ice cover, leaving the pole one of the coldest spots in the world.

United States IGY traverse parties discovered a new mountain range, and a deep underwater trough running from a point 35 miles east of Ellsworth Station and averaging 3500 feet below sea level.

Deep drilling operations, which at Byrd Station already have reached more than 1000 feet into the ice, have brought up cores of ice which fell as snow over 1000 years ago. These operations will be continued at Little America. Analysis of the ice cores is expected to add greatly to knowledge of past climates.

The U.S. IGY effort in Antarctica is supported logistically by the Navy's Task Force 43, commanded by Rear Admiral George Dufek. The task force assignment, a continuation of a massive job begun under Dufek's leadership in 1955, carries the code name Operation Deep Freeze IV.

Future Plans

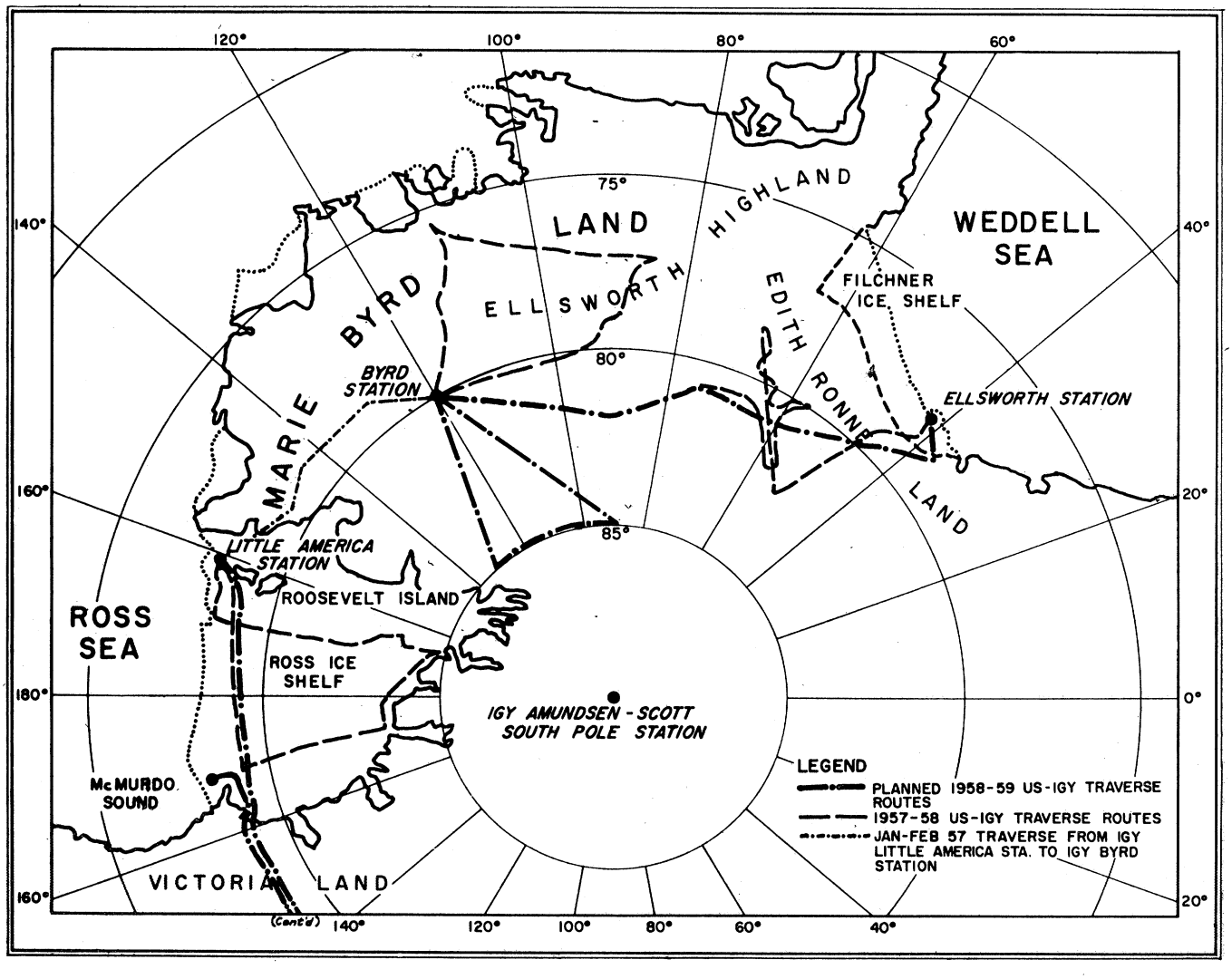
Upon conclusion of the International Geophysical Year, 31 December, U.S. scientific activity in Antarctica will be conducted by the National Science Foundation in cooperation with the National Academy of Sciences' Committee on Polar Research. Four U.S. stations are to remain in operation when the IGY ends. They are the Amundsen-Scott South Pole Station, located at the geographic bottom of the world; the Naval Air Facility at McMurdo Sound; Byrd Station; and Hallett Station on Cape Hallett in the Ross Sea, supported jointly by the United States and New Zealand.

Eleven other nations are carrying on scientific programs in the Antarctic as part of the IGY. They are Argentina, Australia, Belgium, Chile, France, Japan, New Zealand, Norway, the Union of South Africa, the U.S.S.R., and the United Kingdom. Custody of the Ellsworth Station is to be taken over by Argentina, and Australia is to take supervision of Wilkes Station on the Knox Coast.

Solar Eclipse

On 12 October 1958 the sun was totally obscured by the moon for observers along a narrow strip of the earth's surface beginning at dawn in the South Pacific east of New Guinea and extending eastward some 9000 miles to sunset at the west coast of South America. Near the midway point along this strip, a few hundred miles south of Tahiti, the maximum duration of totality occurred: 5 minutes and 12 seconds. This was a longer-than-average period of totality; the maximum possible duration is 7 minutes and 31 seconds.

The narrow path of totality, up to 124 miles wide, was almost entirely over water. It touched, in addition to the western part of South America, only eight small land areas—islands or island



Major oversnow traverse routes which will have been covered by the end of United States participation in the Antarctic Program of the International Geophysical Year (see page 992).

groups—in the South Pacific. Among these were the Danger Islands in the Cook group.

American observing groups selected as their site Motu Koe, the southernmost of the three Danger Islands and the one closest to the center of the path of totality. Transportation and logistic support for the observers were supplied by the Department of Defense. The Navy furnished a vessel, the LSD *U.S.S. Thomaston,* both to transport scientists and equipment and to serve as a base of operations.

The Eclipse and The IGY

This unusually long eclipse was of particular importance because of its occurrence during the International Geophysical Year. The scheduling of the IGY from July 1957, to December 1958, was intended to coincide with a peak period in the cycle of sunspot activity. Solar eruptions during such periods are followed by many observable effects on the earth and its atmosphere, such as cosmic ray storms, auroral displays, disturbances in the ionosphere, magnetic fluctuations, and disrupted radio communications.

The eclipse also afforded the opportunity to coordinate observations of a variety of terrestrial conditions, by the many widely scattered IGY stations, with observations of solar features and terrestrial effects during an eclipse. For the first time, high-altitude research rockets were used to study the effects of an eclipse on the stratosphere and the ionosphere.

First Details of New Space Agency Organization

Appointments to the top management of the new National Aeronautics and Space Administration were announced 5 October by T. Keith Glennan, administrator of NASA. Initially, the organizational structure provides for three principal areas of activity—namely, space flight development, aeronautical and space research, and business administration.

Reporting to the office of the administrator are the directors of each of these areas: Abe Silverstein, John W. Crowley, Jr., and Albert F. Siepert.

Glennan described the NASA organization as follows:

"In the first category, NASA will be concerned with the entire spectrum of space flight operations including the design and procurement of vehicles and satellite payloads, the launching and monitoring of scientific satellites, the accumulation and reduction of data, and activities supporting the objective of launching man into space.

"In the second category, the long-established and highly regarded laboratories acquired from the NACA will continue their programs of basic and applied research in support of aeronautics and space science and technology. Additional effort in this area of activity will be supported in the laboratories of industry and educational and non-profit institutions.

"The third category, business administration, includes the business functions of any well-run organization, such as the development of fiscal and budgetary policies, of contracting policies and their implementation, of policies relating to personnel administration, plant operation and security, and the provision of administrative policy guidance for the decentralized operation of NASA's research centers and field stations."

Proposed Institute for Study of Man in Africa

When at the end of 1958 Raymond A. Dart retires from the chair of anatomy at the University of the Witwatersrand, which he has held since 1923, it is planned that his work be continued and extended by the establishment of an Institute for the Medical and Anthropological Study of Man in Africa.

A group of past and present students and colleagues of Dart have conceived the idea of the institute, the purpose of which would be to advance the study of the living peoples of Africa in health and disease and to serve as a museum, research, and teaching center. The objectives of the proposed institute are set forth by the organizing committee in its constitution as follows:

1) The institute shall advance the study of the peoples of Africa today in health and disease, their bodily structure, function and pathology, diet and nutrition, genetics and racial composition, disease patterns, climatic adaptations, demography, physical anthropology, psychological problems and cultures, including art, music, languages, social and tribal structure, and psycho-social attitudes.

2) In the second place, the institute shall advance the study of man's ancestors in Africa, their fossil remains, migrations, hybridizations, climatic background, associated flora and fauna, and cultures, including implements and other cultural objects, artistic creations and burial customs.

3) The institute shall foster and facilitate research in the laboratory and in the field; provide educational facilities, both intra-mural and extra-mural; set up a museum of Africana, which shall serve as a repository for collections within the University of the Witwatersrand bearing on the subject of man in Africa, past and present; build up a library and set up a centre for the collection, classification and dissemination of information on all relevant aspects of man in Africa.

Africa's need for workers in all of these fields is great, and it is expected that one great service which such an institute would fulfil, would be to draw young men and women into such work and to train competent personnel for field-work up and down the continent. Another important aim should be to provide adequate facilities for, and encouragement to, visiting scientists from overseas to spend periods working on African material.

Dart's record has included the deanship of the Medical Faculty in Johannesburg from 1925 to 1943, membership on the board of the South African Institute for Medical Research from 1934 to 1948 and on the Medical Advisory Committee of the Council for Scientific and Industrial Research from 1946 to 1948. He has served as president of the South African Association for the Advancement of Science and received the association's gold medal in 1939. Among his greatest achievements have been his contributions to all aspects of the study of man in Africa, not least of which has been his discovery and appraisal of the South African fossil ape-men, the Australopithecinae.

Seawolf

On 6 October the atomic submarine *Seawolf* surfaced off New London, Conn., after a record-breaking continuous submersion which lasted for 60 days. The previous record, set by the *Seawolf's* sister ship *Nautilus,* was 31 days and a few hours. The *Seawolf's* feat was held to have significance for a number of fields, chiefly naval warfare and space exploration. Admiral Hyman G. Rickover, commenting on the performance, said it was now possible to establish a hidden base beneath the sea. For the field of astronautics, with its problem of the extended isolation of space travelers, the experience of the crew of the *Seawolf* is expected to have considerable value.

New Atomic Reactor

A prototype of a nuclear reactor which is designed for space-vehicle propulsion will be tested soon at an Atomic Energy Commission facility near Mercury, Nevada. The basic design of the reactor calls for the injection of gases into a fission reaction, their sudden and extreme heating by it, and their expulsion through directing nozzles for propulsion.