

1960 ANTARTIC RESEARCH PROGRAM

ANNOUNCED BY NATIONAL SCIENCE FOUNDATION

United States scientific research in the Antarctic beginning in October 1959 will be supported by \$3,170,069 in grants announced today by Dr. Alan T. Waterman, Director of the National Science Foundation. The grants will provide both for field work in the frozen continent and for associated research in the United States.

"Greater emphasis will be placed by the United States on geology, cartography, and biology during the next year," Dr. Waterman said. "Thirty-five scientists will remain through the 1960 Antarctic winter, while twice this number will be engaged in the coming summer activity."

Scientific research in the Antarctic is made possible through the logistic support of the Navy Department, which has had long experience in polar operations and has mounted several expeditions to Antarctica. The U.S. Naval Support Force is commanded by Rear Admiral David M. Tyree, USN, who relieved Rear Admiral George J. Dufek, USN, in April.

Grants for a total of 29 projects were announced today, with others expected in the near future. In addition, field work will be carried on during the austral summer under earlier NSF grants. In many cases the investigations will be international in scope, with scientists and technicians from many parts of the world participating.

Dr. Waterman pointed out that biologists will have the use of the U.S. Antarctic Biological Research Laboratory at the Naval Air Facility, McMurdo. The laboratory was built and equipped through a Foundation grant of \$82,000 to the Arctic Institute of North America.

"Biology, like cartography and geology, was not one of the scientific disciplines included in the International Geophysical Year that ended last December," Dr. Waterman stated. "During the IGY, data in these fields of research were accumulated only incidentally to the geophysical investigations of the U.S.-IGY program. Many very basic questions about Antarctica remain unanswered, as for example the locations of mountain ranges and the types of marine life around the continent. Work during the forthcoming year will attempt to fill in many of these gaps in our knowledge."

As part of the program, Dr. Waterman noted, NSF is supporting a United States scientific expedition to the Bellingshausen Sea. "If the penetration into these uncertain waters by two U.S. Navy icebreakers is successful," Dr. Waterman said, "the scientific party will gather valuable data in a region never before explored." Scientists aboard the ships will include investigators in biology, geology, cartography, oceanography, and glaciology.

1959-60 Traverse Plans

Two geologists will accompany over-snow traverses during the summer season in Antarctica. On the first traverse a party of seven or eight scientists will climb the Skelton Glacier from McMurdo Sound in October, for a three-month survey of Victoria Land, a desolate, ice-capped expanse of 7,000 to 9,000 feet elevation. The tra-

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verse party will proceed into the interior of the plateau to about 74°S, 140°E, and then to the Hallett Station area.

Seismic soundings, gravity, magnetic, and glaciological studies will be made along the traverse route in addition to geological investigations in the Skelton and Hallett areas. Topographic control points will be established where ice-free areas are encountered.

The group will consist of five United States scientists with Alfred W. Stuart, Roanoke, Va., as chief glaciologist. A New Zealand glaciologist, Arnold Heine, and party leader Frans G. van der Hoeven, Netherlands geo-physicist, will also make the traverse.

The traverse will be supported by a Navy R4D (DC-3) air-supplied fuel cache at the top of Skelton Glacier near Hallett Station for later use, and the party will return to McMurdo by air.

A second party will leave Byrd Station in October for a 1,200 mile traverse of Marie Byrd Land to the coast near the Amundsen Sea. In the Executive Committee and Hal Flood Ranges geological and geodetic studies will be conducted. The party will then travel south to "Army-Navy Drive," tractor train supply trail to Byrd Station, and follow it back to the station.

The geophysical and geological investigations of this 7-man party are expected to contribute greatly to the slim store of knowledge about the area. This group, under Scottish glaciologist John Pirrit, will also provide data for map-making. It will receive support from R4D's.

The over-snow traverses are operated by the Arctic Institute of North America under NSF grants totaling \$613,000, made in 1958. A grant of \$25,000 to the U.S. Geological Survey provides for the topographic surveys and geological work of the traverse parties.

An airborne traverse for seismic, gravity and magnetic investigations will be put into the field by the University of Wisconsin. Dr. Edward C. Thiel and two assistants will be landed at 8 to 12 evenly-spaced points along the 88th west meridian between Horlick and the Sentinel Mountains. Their investigations are expected to define the sub-surface features including the possible trough between the Weddell Sea and the Ross Sea.

1960-61 Traverse Plans

In preparation for geophysical traverse programs during the 1960-61 field program, a grant of \$566,985 has been made to the University of Wisconsin. It is anticipated that one traverse will depart Byrd Station in November, 1960, and proceed to the Bellingshausen Sea coast. A second traverse will penetrate the high polar plateau in the area between McMurdo, the Russian station Vostok, and the South Pole Station.



Plans for the geophysical field studies are going forth under the direction of G. P. Woollard, C. R. Bentley, and E. C. Thiel. A second grant of \$135,930 to the University of Wisconsin will allow these investigators to continue the reduction of seismic, gravity and magnetic data collected on traverse operations.

Antarctic Biology Studies

Biological investigations at McMurdo Sound will include a continuing study by Dr. D. E. Wohlshlag of Stanford University on the ecology of the Ross Sea area, under an NSF grant of \$4,143. Dr. Wohlshlag began his work with three assistants during the 1958-59 Antarctic summer. John H. Dearborn of Cape Elizabeth, Maine, has remained during the winter to collect fishes through holes in the bay ice. He will be joined by another worker to continue the research through the coming summer.

Presently in charge of the U. S. Antarctic Biological Laboratory is Madison E. Pryor of the University of Tennessee. Pryor is conducting research on land invertebrates of the McMurdo Sound and Cape Hallett areas.

At Wilkes Station, where the scientific program is conducted cooperatively with the Australian Government, Richard L. Penney of the University of Wisconsin is investigating orientation in the Adelie penguin and the parental and sexual behavior of the Adelie. Further work on the Adelie will be carried out during the new expeditionary season at Hallett Station.

A Duke University project under the direction of Dr. Knut Schmidt-Nielsen will send Donald S. Douglas to gather data on the salt and water metabolism of the penguin. Using the extensive penguin Colony on Cape Hallett as his laboratory, Douglas will examine the nasal discharge of the Adelie to determine whether the salt taken in by the bird is eliminated from the body by this means, as currently thought.

Cartographic Studies

Two NSF grants to the American Geographical Society will make possible more accurate maps of Antarctica. A continuation of the small-scale map of the Antarctic, begun during the IGY, will be carried out under a grant of \$16,685. William A. Briesemeister, Chief Cartographer of the Society, will keep the map up to date, adding discoveries as they are made, correcting features which are more accurately positioned, and inserting accepted names for new features.

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A grant of \$11,251 to the Society will enable it to conduct further work in preparation of an Antarctic atlas. This atlas, undertaken by O. M. Miller, Deputy Director of the Society, will be designed to show on a series of base maps many characteristics of the continent as they vary by seasons and by location. Climatic conditions, the appearance of sea ice and the configuration of the sub-surface topography are examples of the information which may be included in such an atlas.

Large scale mapping will be carried out by the U. S. Geological Survey under a grant of \$200,000. Using topographic information and mapping photography from past and current Antarctic activities, the Survey will continue compiling a series of large-scale maps on coastal and mountainous areas.

Organization of U. S. Antarctic Research

Projects of the U. S. Antarctic Research Program are arranged by the National Science Foundation in consultation with the Committee on Polar Research of the National Academy of Sciences-National Research Council. The Committee was formed under the chairmanship of Dr. Laurence M. Gould to advise on the Antarctic program when the Foundation was directed to coordinate and administer the U. S. scientific effort in the Antarctic following the IGY. Government agencies with interests in the Antarctic are represented on the Inter-departmental Committee on Antarctic Research, a second advisory group assisting the Foundation.

The U. S. Naval Support Force, Antarctica, provides the operating personnel for the Byrd, Hallett, and Pole Stations and for NAF McMurdo. It also furnishes transportation into these stations from New Zealand.

The U. S. Antarctic Research Program consists of research conducted at seven Antarctic installations, as well as in laboratories and research centers in the U. S. The Byrd and Pole Stations and the Naval Air Facility, McMurdo, are wholly U. S. stations.

At Hallett Station the program is a cooperative New Zealand-United States effort, as it was throughout the IGY. Since the end of the IGY, the Ellsworth and Wilkes Station programs have been jointly run with Argentina and Australia, respectively. At New Zealand's Scott Base on McMurdo Sound a small group of U. S. scientists work on common projects with New Zealand investigators.

Summer programs in the Antarctic occupy scientists up to six months - from October to March - the period of highest temperatures, 24-hour sunlight, and accessibility to remote areas by air and water. During this period, the U. S. Naval Support Force, Antarctica, provides the logistic support to transport scientific personnel into McMurdo Sound and from there to outlying stations and areas of scientific interest.

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The seven-station meteorology network established by the U.S. at the beginning of the International Geophysical Year will be continued through a National Science Foundation grant of \$1,047,000 to the U.S. Weather Bureau. Meteorologists will winter at the four stations wholly supported by the U.S. and will join parties working at Hallett, Wilkes and Ellsworth Stations which are cooperative programs with New Zealand, Australia and Argentina respectively.

With the approach of winter in March, plans and ship activity ceases and the scientists are isolated until the following austral spring. Throughout the entire year intensive station programs are continued.

The winter programs of U.S. scientists during 1960 will be as follows:

Byrd Station: Eleven scientists will winter at Byrd Station pursuing studies in atmospheric noise, aurora, geomagnetism, glaciology, ionospheric physics, meteorology and seismology. A transport engineer will be occupied in readying vehicles and trail equipment for the traverse of the following summer, 1960-61. A naval support detachment of 10, including a medical doctor, will operate the Station.

Pole Station: Nine scientific personnel will carry out investigations in aurora, geomagnetism, glaciology, ionospheric physics, and seismology. In addition to standard programs, the meteorological operations will include special studies on solar radiation, ozone, measurements, carbon dioxide, and nuclear radiation. Ten naval personnel will manage the daily operation of the station under the command of a medical officer.

Naval Air Facility, McMurdo: During the 1960 winter, four scientific personnel wintering at NAF, McMurdo will investigate cosmic rays, conduct glaciological measurements, perform seismic soundings, and operate the biological laboratory. Large new vehicles, which will give the traverse of the 1960-61 summer a long-range, self-sufficient capability, will be readied for the field. About 125 naval officers and men at the Facility will be engaged in maintaining this facility base and the runway on the bay ice.

Hallett Station: Three New Zealand scientists will carry out auroral, geomagnetic, ionospheric, and seismic observations. Two U.S. civilian meteorologists and three naval aerographers will make daily upper-air and surface weather observations and conduct research in solar radiation. A doctor and six other naval support personnel will run the station.

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Ellsworth Station: With Argentine scientists, four U.S. personnel will perform research on the aurora, cosmic radiation, geomagnetism, ionospheric physics, and meteorology. About 25 persons will winter at the station, which will be operated by Argentina.

Wilkes Station: Australian and U.S. scientific personnel will carry on projects in auroral investigation, biology, geomagnetism, ionospheric physics, meteorology and seismology. Four of the 15-man, Australian-operated station will come from the U.S.

Scott Base: At this New Zealand installation of 15 men, two U.S. oceanographers will investigate the waters and the ocean bottom of McMurdo Sound. A physicist from the U.S. will work with a New Zealand scientist on problems of auroral physics. Other programs will include geomagnetism, meteorology and seismology.

Within the Foundation, Dr. Thomas O. Jones serves as Antarctic Program Director; Chief Scientist is A.P. Crary, who returned to the U.S. in March from over two years in the Antarctic as Deputy Chief Scientist of the U.S.-IGY Antarctic Program. Mr. Crary is on part-time leave from Air Force Cambridge Research Center, his parent organization. He will supervise investigations, selection of personnel, data analysis, and publication of results.

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