

antarctic notes

Gathered by a correspondent during the first half of the summer season (Oct.-Feb.) of The U.S. Antarctic Research Program

CORING

No Melting Apparent on Ice Sheet

There has been no melting or deposition of ash on the continental ice sheet at Byrd Station, Antarctica during the past 5,500 years. This preliminary analysis was made by Dr. Anthony J. Gow of the U.S. Army Cold Regions Research and Engineering Laboratory (CRREL), Hanover, N.H.

Dr. Gow, in conjunction with Dr. B. Lyle Hansen and Herbert T. Ueda, is drilling a hole through the 8,000 foot Antarctic ice sheet. When the bottom is reached in February 1968, it will be the deepest hole ever drilled through an ice body. (A CRREL research team drilled through 4,460 feet of ice at Camp Century, Greenland, in 1966.)

To date, Dr. Gow has retrieved ice cores from a depth of 2,000 feet. This ice, deposited as snow well before the birth of Christ, has shown a remarkable similarity to snow currently being deposited. Carbon dating of the carbon dioxide trapped in the ice gives accurate deposition dates. The bottom of the ice will provide cores deposited as snow 30,000 years ago.

About 20 of the 10- to 18-foot ice cores will be shipped to the CRREL laboratory for studies of:

- Rate of snow accumulation, which will indicate growth or retreat of the polar ice cap;
- Seasonal temperature variations and average annual temperature;
- Rate of deposition of meteoric particles;
- Physical condition of the ice and underlying rock;
- Composition of the earth's atmosphere at Byrd Station for the past 30,000 years;
- A possible correlation between the Antarctic ice sheet and the period of North American glaciation 25,000 years ago.

SLEEP

35 Feet Down at the South Pole

In a behavioral science laboratory 35 feet beneath the surface of the ice at the geographical South Pole researchers are studying the sleep and dream patterns of secluded naval and scientific personnel. Now in the second year of a three-year study, the sleep pattern investigation is expected to provide data in planning for human factors in future terrestrial and extraterrestrial explorations, and in predicting impending breakdowns of men under stress. It had previously been observed that Antarctic explorers as well as scientists and others based on the continent suffered from insomnia—termed “big eye” by Antarctogeans.

The studies, conducted by Drs. Jay T. Shurley and Chester M. Pierce of the Oklahoma Medical Research Foundation, will try to determine whether months of isolation will cause a change in an individual's psychological make-up. By using an electroencephalograph, electrocardiograph and polygraph on a sleeping subject, they obtain measurements of brain waves, heart action and electrical resistance of the skin. A computer evaluates this data, indicating dream habits and depth of sleep, producing a profile of the sleeping individual.

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BIOLOGY

Algae Survive at Minus 47 F.

Life in the form of algae and bacteria has been located in a dormant stage at temperatures as low as 47 degrees below zero F. Dr. Robert E. Benoit, Virginia Polytechnic Institute and Dr. Roy E. Cameron, Jet Propulsion Laboratory, discovered these organisms about a foot beneath the surface in the volcanic soil of Antarctica's ice-free Taylor Valley.

These microorganisms, which are dormant during the winter months, become active only with the summer flow of run-off waters from the glaciers located in the mountains above the valley. Algae, which require sunlight as their source of energy, are believed to exist in a dormant stage at temperatures below minus 60 degrees F.

Dr. Cameron's studies of Antarctica's microbial life are expected to provide information useful in developing life detection equipment for automatic landing devices planned for Mars.

PLANKTON

Cold Waters Pasture Rich Algae Fauna

In contrast to the barrenness of the Antarctic continent, the adjacent waters, during the summer, may well be the world's richest area of marine life. One reason for this abundance of life may be the water's low temperature, which enables it to hold more dissolved oxygen and carbon dioxide than seas to the north.

Current studies by Dr. John S. Bunt, Institute of Marine Science, University of Miami, indicate that marine microalgae, a base of the ecological food chain, develop in Antarctic waters below the normally accepted limit of the light zone.

Scuba divers at McMurdo Sound have penetrated through 16 feet of ice to collect samples of microalgae and protozoa living in the frigid waters. An analysis of these algae leads Dr. Bunt to estimate that the annual primary production of the Antarctic waters may exceed 30 million tons of organic carbon.

TRAVERSE

Third Leg Scheduled

The third leg of a four-year, 5,000-mile traverse over the Marie Byrd Land sector of West Antarctica will be completed early next year. The 1,200-mile trip across one of the last remaining unexplored regions of Antarctica will be led by veteran explorer-scientist, Dr. Charles R. Bentley of the University of Wisconsin.

Dr. Bentley and a party of nine will travel by tractors called sno-cats across the barren ice. Supplies will be air dropped. Taking seismic soundings, magnetic and electromagnetic readings approximately every four to six hours, the traverse crew will measure the thickness of the continental ice sheet. Dr. Bentley also expects to obtain information on ice flow and ice crystal structure.