BIOLOGY

Antarctic "Summer" Study

➤ A BROAD PROGRAM of research, supported by $3,175,096 in grants from the National Science Foundation, will begin in the Antarctic in October, Dr. Alan T. Waterman, NSF's director, reported in Washington, D. C. An independent Government agency, NSF administers the United States antarctic research program.

A large part of the funds will be devoted to special biological projects, including the study of mites, flies and lice that may have been brought into Antarctica by air currents.

October is the beginning of antarctic summer. About 120 scientists and technical assistants will spend the "summer" in Antarctica. Forty-three are expected to winter over there (summer in the United States).

The vast frozen continent has become "a unique laboratory for environmental studies," Dr. Waterman said, calling attention to the ten biological projects planned there for 1960-61.

Biologists are particularly interested in several of the primitive life forms there and the adaptation of life to an extremely rigorous environment.

A study will be made of the effect of the earth's rotation on the metabolic rhythm of plants. This growth rhythm becomes disoriented in some plants when they are placed in rotation counter to the earth's rotation. Investigators from the University of California at Los Angeles, by means of a drum rotating counter to the earth's spin, hope to find out how this affects the timing and response of plant growth—whether the "biological clocks" of certain plants and animals are affected by external environmental factors or whether they are innate.

The metabolism of fishes and studies of plankton in fresh water lakes of the Antarctic also will be investigated. The salt and water metabolism of the native penguins there will be explored.

A party led by Dr. Albert P. Crary, chief scientist of the U.S. antarctic research program, will explore miles of the South Polar Plateau. A second party under Dr. Charles R. Bentley of the University of Wisconsin will take geophysical data on Ellsworth Island.

Dr. Crary's expedition will include some of the world's most seasoned antarctic scientists, with experience of at least seven traverses. Sveneld Evteev, a Russian exchange scientist, now wintering at McMurdo Sound, will be among this valuable group of antarctic experts.

NSF's antarctic research money has been awarded to several Government agencies as well as many colleges, universities and scientific institutions, with the latter showing a steadily increasing interest. Several additional grants are expected to be made before the onset of the program in October. Total NSF support is expected to amount to about $4,000,000.

• Science News Letter, 78:194 September 24, 1960

CHEMISTRY

Control in Living Cells

➤ CONTROL WITHIN living cells at the molecular level is opening a new concept of the chemistry of living things that shows that cells behave with a purpose.

This "chemical feedback" idea, modeled upon the electronic feedback so important in the extraordinary blossoming of electrical appliances, is the latest impact of chemistry upon living matter.

At the American Chemical Society, Dr. Van R. Potter of the University of Wisconsin Medical School, called chemical feedback the most significant finding since the development of the gene theory that explains how the stream of life is passed on from one generation to the next.

"It opens up a new world that Darwin never dreamed of," Dr. Potter declared, "yet it would have pleased him immensely."

Chemical feedback explains how living cells are able to behave purposefully. Modifications of the enzyme pattern can come about in single cells through the operation of feedback mechanisms at the molecular level. These processes underlie the purposeful phenomena seen at higher levels.

It has been found that if an organism that can make a certain amino acid is given that amino acid in its food, it promptly ceases to make the substance provided for it. Therefore, Dr. Potter explained, it acts as if it were intelligent.

Dr. A. B. Pardee of the University of California at Berkeley told how certain mutants (changed varieties) of bacteria make large amounts of an enzyme that produces a compound that they cannot use and therefore have no need for. These mutants behave like idiots because their change has interrupted the feedback processes that enable the "wild" types to behave intelligently.

Discovery of a child with congenital defects that causes a non-purposeful reaction like the behavior seen in mutant bacteria was reported by Dr. James A. Bain of Emory University.

• Science News Letter, 78:194 September 24, 1960

Decontaminates Water

➤ WATER FROM A WELL purposely contaminated with radioactive materials can be purified with standard U. S. Army water purification equipment, scientists were told at the national meeting of the American Chemical Society in New York.

Don C. Lindsten and Richard P. Schmitt, both of the U. S. Army Corps of Engineers, added aged nuclear bomb debris from an underground test, ground up very finely to simulate atomic fall-out, strontium-90 and other radioactive materials, to a brackish water well.

Three typical water-treating units, mounted on trucks for field use, were employed in the tests. These were a unit involving coagulation in a solids contact clarifier, diatomite filtration, and rapid sand filtration, an ion exchange unit and a permaselective membrane electrodialysis unit.

The purified water produced by all three methods was well below the acceptable tolerance.

• Science News Letter, 78:194 September 24, 1960

Chemicals Washed Out

➤ DETERGENTS have long given trouble to chemists concerned with water purification. They have had no easy way of getting washing chemicals placed in water upstream out of drinking water used downstream.

But Dr. I. M. Abrams reported at the American Chemical Society meeting in New York that alkyl benzene sulfonates—the hardy part of detergents—can be almost completely removed from water by passing it through a plastic-like material A-102D, or Duolite. Dr. Abrams is a chemist with the Chemical Process Company of Redwood City, Calif.

The removal process utilizes ion exchange in which a harmless ingredient of one compound is released in exchange for the material collected.

• Science News Letter, 78:194 September 24, 1960

TECHNOLOGY

Atomic Achievements Aid Research and Industry

➤ CANCER RESEARCH and industry have been advanced by two achievements in atomic development at Oak Ridge National Laboratory in Tennessee: more economical production of cobalt-60, lowering consumer costs 80%, and the first known separation of gram quantities of osmium isotopes.

Better production methods for cobalt-60 developed by the Atomic Energy Commission at Oak Ridge allow the Government to make a profit on sales even at reduced prices.

This should encourage private commercial production, John Maddox, AEC isotope distribution specialist, told SCIENCE SERVICE. The Government would prefer that nuclear development become a function of private industry.

Cobalt-60 is a valued tool in the treatment of deep-seated cancers and for food preservation. It is used by industry for detecting structural defects in metal products, and in the production of plastics.

The stable osmium, now available for the first time in significant quantities, is of particular value in basic research. It will be used as a tracer to shed new light on the behavior and composition of matter, AEC scientists predict.

• Science News Letter, 78:194 September 24, 1960