

# earth and environment

## NUTRITION

### Fish protein concentrate plant

Commercial production of fish protein concentrate, one of the leading candidates in battling the shortage of protein throughout the world, has come closer to fruition in the U.S. with selection of a builder for the first large-scale Federally financed demonstration plant.

A tasteless and almost odorless powder, the concentrate is 80 percent animal protein and is made from hake and hake-like species of fish. Such fish are abundant around Grays Harbor in Aberdeen, Wash., where Ocean Harvesters, Inc., of Los Angeles, will design, build and operate the pilot plant, scheduled to begin operations during the 1970 fishing season.

## ANTARCTIC RESEARCH

### Station on stilts evades snowdrifts

A scientific station on stilts has been built at Wilkes Base, Antarctica, to replace an old station which is now almost completely buried by a half-mile-long permanent snow drift.

The original station, built 11 years ago by the U.S., will now be abandoned in favor of the newer, Australian-built building. The growing snow drift has made it difficult to keep up the old station and to carry out its scientific program, and the snow is packed so tightly as to block several fire exits.

The new building, constructed over the past four summers, is elevated so that the snow will drift beneath and not against it.

## DESALINATION

### Sweetening Australia's longest river

A pair of new salinity-control works has been installed along Australia's longest river, the 1,609-mile Murray, to make its waters more suitable for irrigation.

The two projects, which together are expected to keep some 50,000 tons of salt from entering the Murray each year, have been pushed ahead in order to have them ready for the 1968-69 irrigation season. The projects were financed by the National Water Resources Development Program.

One, the Sunraysia project, diverts saline water which formerly drained into the Murray from the Mildura Irrigation Area to evaporation basins away from the river. The other project pumps saline water from Barr Creek to nearby Lake Tutchewop for evaporation, passing on the way through three small salt lakes being used as supplementary evaporation basins.

## CLIMATOLOGY

### Earth at its driest

Using such diverse signs as seashells, mangrove pollen and pack rat nests, a scientist estimates that earth is now in one of the driest periods it has had in the last 40,000 years.

The last major dry spell, says Dr. Rainer Berger of the University of California at Los Angeles, was some 5,000 years ago, and it was not as severe as the present one.

One of the keys to Dr. Berger's research is pack rat nests, many of which have existed in the southwestern U.S. for tens of thousands of years. Analysis of the plant material in the nests can indicate temperature and moisture levels that were present when the plants were alive. Seashells, as well as pollen from mangrove palms growing in ocean swamps, can indicate changes in ocean levels, and shorelines of dry lakes show past level variations like rings in a bathtub.

"On a geological time scale," says Dr. Berger, "major climate changes can come about quite rapidly. Within a few hundred years, the climate can go from very moist to quite dry. . . . In designing huge dams and other water-collecting systems, we should make provisions for possible wetter periods in the future."

## GEOLOGY

### Manganese nodules in shallow water

A deposit of buckshot-sized nodules of manganese, valuable in applications from dry cell batteries to steel alloys, has been found in only 50 to 100 feet of water on the bottom of Green Bay, between Marinette, Wis., and Escanaba, Mich.

Other large deposits are known, but most are under thousands of feet of water on the ocean bottom.

The nodules were discovered by Prof. J. Robert Moore, a University of Wisconsin marine geologist, and a group of graduate students doing research under a \$376,000 National Science Foundation sea grant.

In some areas, Prof. Moore estimates, the deposit may contain as much as 200,000 tons of manganese per square mile in the topmost foot of bottom sand, or almost 13 pounds of manganese per cubic foot. The find may cover some 200 square miles, he says, which could make it worth as much as \$15 million.

The manganese should not be touched, however, Prof. Moore warns, until mining techniques have been perfected. The depth of the deposit should be accurately determined, he says, and then a way developed to extract the mineral without danger of pollution.

## METEOROLOGY

### Air-sea interactions studied off Barbados

A vertical column of air and water extending from the topmost reaches of the atmosphere down to the ocean floor will be investigated beginning in 1969 in a large-scale study involving some 18 Federal agencies and departments.

Project BOMEX, the Barbados Oceanographic Meteorological Experiment, will include a 300-mile-square area of ocean near Barbados Island in the Atlantic. Satellites, as many as seven ships, 10 to 20 aircraft and a variety of buoys will pour information about air and water characteristics and movements into a specially designed data-handling system at the space agency's Mississippi Test Facility.

At first, the goal of the project will be just to see what can accurately be measured by marshalling all the available techniques; prediction methods will be developed later. After BOMEX, a 100-times-bigger project called TROMEX (Tropical measurements) is planned, followed by a full international global effort in 1976.