

Science at the bottom of the world

Science News Editor Kendrick Frazier is on a reporting trip to Antarctica. These are some of his preliminary impressions after two days there, which included a visit to the South Pole. The story was filed from McMurdo Station, Antarctica, headquarters of the U.S. scientific research effort on the continent. He will report on several of the science programs in detail after his return.

This is the busy season at McMurdo. It is the Antarctic summer, a time of continuous daylight, and scientists pass through almost daily on their way to and from outpost stations or temporary field research sites. The main, and virtually only, activity in Antarctica is scientific research.

Sixty-five projects involving 175 U.S. scientists are under way during the 1973-74 summer. They range from studies of how a protein in fish living in Antarctic waters keeps them from freezing to observations of trace elements and possible global air pollutants at the South Pole, from penguin biology to historical glaciology, from drilling into the continent to triggering electron showers in the atmosphere.

They are being performed not just to better understand Antarctica but also to learn how it affects the global environment and to make special use of the continent's unique capabilities as a natural scientific laboratory. The National Science Foundation funds the U.S. Antarctic Research Program.

McMurdo, the main U.S. station in support of such efforts, is a strange mixture of mundane civilization and raw and beautiful nature. Looking out from any promontory, one can see in the foreground power lines, water pipes, muddy roadways, dirt-covered piles of snow, and a trash dump. But to the west, across miles of glistening sea ice, looms a range of majestic mountains, cold, lonely and formidable, part of the Transantarctic Mountain Range that traverses a large portion of the continent. Beyond them begin the vast expanses of the Antarctic ice cap. Twenty miles to the north of McMurdo, rises snow-covered Mt. Erebus, a 12,400-foot-high volcano, a cloud of smoke hovering over its summit.

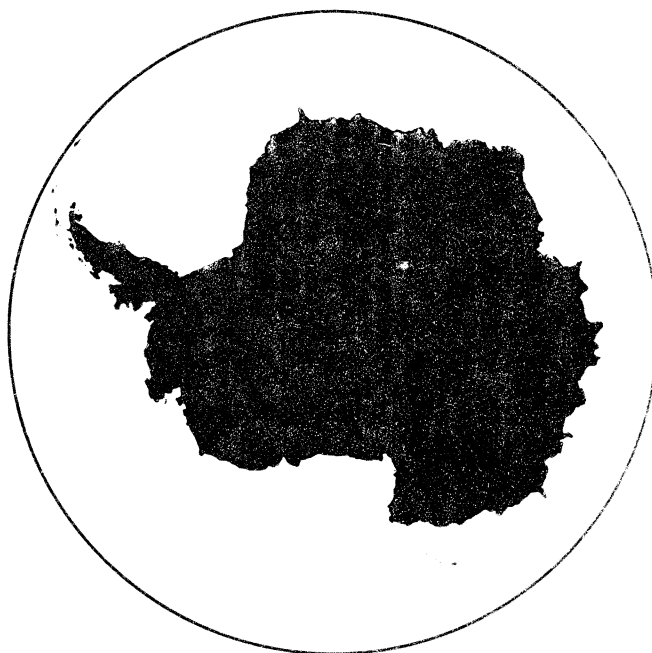
The December temperatures at McMurdo seem unexpectedly mild. It reached a pleasant 33 degrees F. on the day of our arrival. By early January icebreakers will have broken through to McMurdo, and the continent will then soon have its first delivery by ship of cargo and fuel. Until then all supplies and fuel are delivered by air.

For the past decade, the station has had a nuclear generating plant but it has been shut down since last year, when it was discovered that insulation containing chlorides around the reactor pipes had become wet, a condition that could lead to widespread corrosion. The problem is considered too costly to repair. The small, 1,800 kilowatt plant is considered obsolete, and is being painstakingly dismantled and taken away. Under the terms of the Antarctic treaty, all radioactive materials have to be removed from the continent. A conventional power facility is being expanded by addition of two new diesel generators.

In contrast to the diverse natural setting at McMurdo, the South Pole station, 840 miles inland, sits amid a broad, flat, featureless sheet of snow and ice. The elevation is 9,186 feet. Some 8,850 feet of that is ice.

During our visit there this week, the temperature was minus 26 degrees F. but there was practically no wind. That, and the relatively bright sunlight, made conditions more pleasant than bitter.

The United States has operated the station at the South



Pole since 1957, but the accumulation of blown snow is gradually crushing it, so a new station is being built about a half mile away. Its main feature is a 52-foot-high, 164-foot-diameter geodesic dome, housing three individual buildings for scientific laboratories, living quarters, dining hall, meeting hall, post office and other facilities for about 50 persons.

The geodesic dome, built of aluminum struts covered by triangular aluminum panels, is completed. One can climb up the exterior ladder to the top and get a remarkable view of the South Pole ice cover, the telltale signs of the present research station buried beneath the snow, and the construction activity at the new site. The new pole station is being constructed by a 165-man Navy Seabee detachment with additional assistance from a private construction firm that will have the task of getting the new station into shape for occupancy in the 1974-75 season.

Twenty-two men, including nine scientists and technicians and thirteen Navy support personnel, spent the entire 1973 winter at the South Pole station. What's it like? One of the two winter residents still not relieved of duty is Gary Adair, a young seismology technician operating a seismic station that records earthquakes around the world. Since the pole is at the convergence of all lines of longitude, the data help especially to identify their latitude. Adair has been at the subsurface pole station continuously since Christmas Eve of 1972.

"We didn't have a whole lot of problems," he says, "but there's so little variety of where to go and what to do."

It was too cold, he discovered (often around minus 100 degrees) to go outside "just for pleasure." Would he do it again? Not doing the same job, and "not for the next four or five years."

The people at the South Pole station are obviously not working in ideal conditions. But they are well-fed and well-clothed, their quarters and living areas are comfortably warm, and they are supported by modern communications and a massive air logistics effort.

This is the age of systematic scientific study in the Antarctica. One cannot help thinking back almost 62 years to the lonely tribulations of Amundsen and his men, the first to reach the pole, and Scott and his men, who lost their lives after reaching it a month later. One gains an awesome respect.