Mount Lagrange at the northwestern end of the range. Next, they worked back across the Blaiklock Glacier, from Mount Homard to Turnpike Bluff in the southwest. Later, a visit was paid to the Herbert Mountains, where Mike Skidmore fell 200 ft. over snow and scree, but was fortunate in suffering only superficial cuts, bruises, and abrasions. His companion, Peter Clarkson, got him back to the depot after a few days, and later they were able to make another journey to investigate the western peaks of the Read Mountains and, finally, Stephenson Bastion. On January 23, 1969, they returned to the depot to await the aircraft.

Meanwhile, the two surveyors and two assistants (Nick Mathys and Harry Wiggans) concentrated on providing precise ground control for the western part of the Shackletons, the air photography having already been flown by the United States. The Tellurometer and theodolite traverse started and closed at the depot, the first station being established on Mount Greenfield. The traverse continued eastward to a nunatak on the east side of Cornwall Glacier, then northwards via Crossover Pass. Unfortunately, as the surveyors were moving into position for the third Tellurometer ray, Nick Mathys broke a leg. He was taken back to the depot, where he was left in the care of Tony True.

This accident left only Blaiklock and Wiggans to continue the traverse, and they necessarily had to travel independently of each other. However, taking particular care, they were able to make a complete circuit of Flat Top and close the traverse on the depot by January 10. There, they found that Nick Mathys and Tony True had observed a series of sun positions for latitude and longitude, besides maintaining a very complete series of aneroid readings for height computations.

The last traverse of the survey party comprised a dogleg from the Cornwall Glacier, along the southern peaks of the Read Mountains to 23°30′W. on the southernmost peak at the east end of the range near Otter Pass.

By January 23, all parties were awaiting pick-up by the U.S. naval aircraft at the depot. Throughout, the party had been in good radio contact with Halley Bay, and on the 24th they heard that flying conditions were perfect. At 0200 hrs on the 25th, the plane landed and the group, together with their equipment, was loaded in 20 minutes.

The return flight was uneventful, except for low clouds at Halley Bay, but this presented little problem. By this time, the relief ship, *Perla Dan*, was at the station and provided a small celebration for the successful conclusion of the joint U.S.-U.K. venture. It is expected that one further season's work will provide adequate ground control for the entire range.

Norwegian Antarctic Expedition, 1968-1969

THORE S. WINSNES

Norsk Polarinstitutt

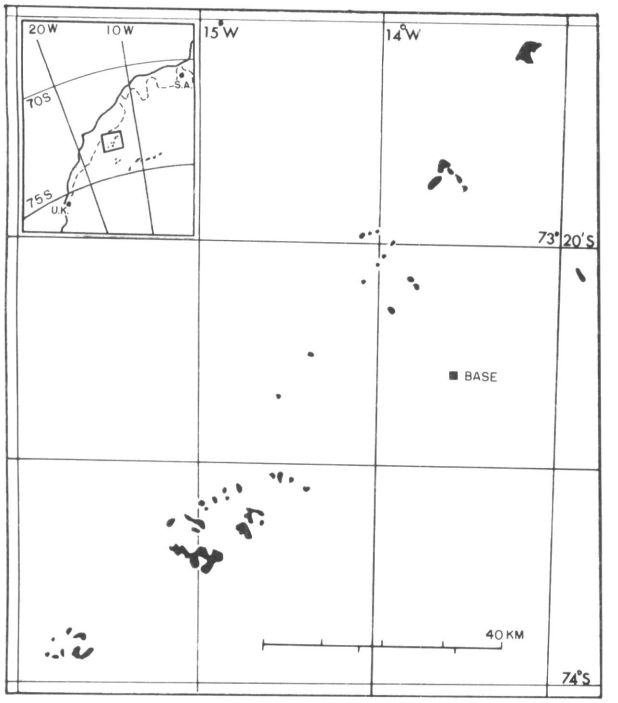
The aim of the Norwegian Antarctic Expedition was to carry out mapping, geological and glaciological investigations of the Kraul Mountains (Vestfjella) in western Queen Maud Land. Members of the expedition included Thore S. Winsnes, geologist and leader; Audun Hjelle, geologist; Torbjørn Lunde, glaciologist; Dag Norberg, topographer; Ola Steine, geodesist; and Kåre M. Bratlien, radio operator.

The expedition, which was organized by the Norwegian Polar Institute, Oslo, received the assistance of the National Science Foundation in the provision of American equipment and arrangements for logistics. Only about 500 kg of scientific instruments were brought from Norway.

The expedition party, ready to leave on November 14, after spending a fortnight at McMurdo Station, was further detained until November 22 by unfavorable weather and radio conditions. The 6 members of the expedition, equipped for 2½ months of field operations, were taken from McMurdo to the Kraul Mountains, making a short stop at Pole Station to refuel the LC–130 Hercules aircraft. After eight hours' flight, the Hercules landed south of the central part of the mountains in a spot particularly selected, after a careful study of aerial photographs, as being the most suitable for landing and base operations.

Work was organized into two field groups, each consisting of one topographer and one geologist, equipped with a motor toboggan and two Nansen sledges for transportation. For safety, the groups travelled together and operated from joint field camps. They were in daily radio contact with the main base, where investigations of snow accumulation and meteorological observations were carried out. In case of emergency, this group could operate with a third toboggan as a rescue team. Radio contact with the "outer world" was maintained through courtesy of the South African National Antarctic Expedition (SANAE) and Halley Bay Bases. The latter forwarded messages to and from McMurdo through Byrd Station.

On several sledge journeys, covering 800 km in all, the geology of the mountains was mapped, triangulations were made, and base measurements were taken. The geology of the Kraul Mountains is rather monotonous, consisting of amygdaloid basic-to-intermediate lavas in thick, nearly flat-lying beds. An ultrabasic



Kraul Mountains

olivine-rich intrusive is dominant in the westernmost part of the mountains. In the east, a small isolated outcrop consisted of sedimentary rocks in a sequence of about 50 m, containing a fossil *Glossopteris* flora of Permian age. All mountains were crossed by dolerite sills and dykes.

Astronomical observations of the sun and stars were made to get an exact location of the mountains; for elevation estimation, a series of pressure readings will be compared with contemporaneous ones from SANAE and Halley Bay. Measurements of the magnetic field were also made. During work in the mountains, animal and plant life were observed, and some samples were taken.

In January, the glaciologist travelled 70 km north to the ice shelf, where a snow pit was dug and core drillings were made in order to compare the conditions there to those at the main base. Facilitated by favorable conditions, the work was finished ahead of schedule. Owing to coarse sastrugi and soft snow, the LC–130 aircraft experienced difficulty in becoming airborne, but succeeded after climbing up a slope and taking off downhill. After a day at the South Pole Station, it arrived at McMurdo Station on January 20.

Animal Airlift, 1968

K. N. MOULTON

Office of Antarctic Programs
National Science Foundation

During the early morning hours of December 2, 1968, a C–141 Starlifter, presently the largest transport aircraft of the Military Airlift Command, lifted off from the sea-ice runway at McMurdo Station with a cargo of penguins, skuas, and seals destined for use in biological research and zoological exhibitions in the United States. The aircraft stopped briefly at Christchurch, New Zealand, and Honolulu, Hawaii, then proceeded to the continental United States where specimens were offloaded at San Diego International Airport; Grand Forks AFB, South Dakota; Scott AFB, Illinois; and Andrews AFB, Washington, D.C. The Starlifter arrived at Andrews Air Force Base at 2130 local time on December 2, just 36 hours after lifting off from McMurdo Station. The touchdown at Andrews brought to a successful conclusion the third animal airlift of the U.S. Antarctic Research Program during the past several years. The primary purpose of the airlift was to support physiological research of Weddell seals being conducted by Drs. Robert W. Elsner and Gerald L. Kooyman at Scripps Institution of Oceanography, and navigational studies on Adélie penguins being conducted by Dr. Richard L. Penney of the New York Zoological Society. To utilize fully the airlift capabilities of the C–141, the National Science Foundation agreed to fulfill several requests from zoological parks and arrange for the return of Adélie and emperor penguins as well as south polar skuas for the Detroit, Cincinnati, St. Louis, and Milwaukee Zoological Parks. Representatives of the zoological parks arrived in late November to assist in the collection of the animals and to accompany them on their return to the United States. Coordination of the field collecting and the selection of specimens was provided by Dr. Penney.

Drs. Elsner and Kooyman and their associates returned four Weddell seals and ten Adélie penguins to San Diego. Dr. Penney selected five skuas and ten Adélies for use in orientation experiments. In addition, he brought back eight skuas for Dr. William J. L. Sladen of Johns Hopkins University. The Detroit Zoo received 20 Adélie and 10 emperor penguins and 5 skuas. The Milwaukee Zoo received 6 emperors while the St. Louis Zoo obtained 8 skuas, 8 emperors and 8 Adélies. Eight Adélies, 4 emperors, and 4 skuas were delivered to the Cincinnati Zoo.