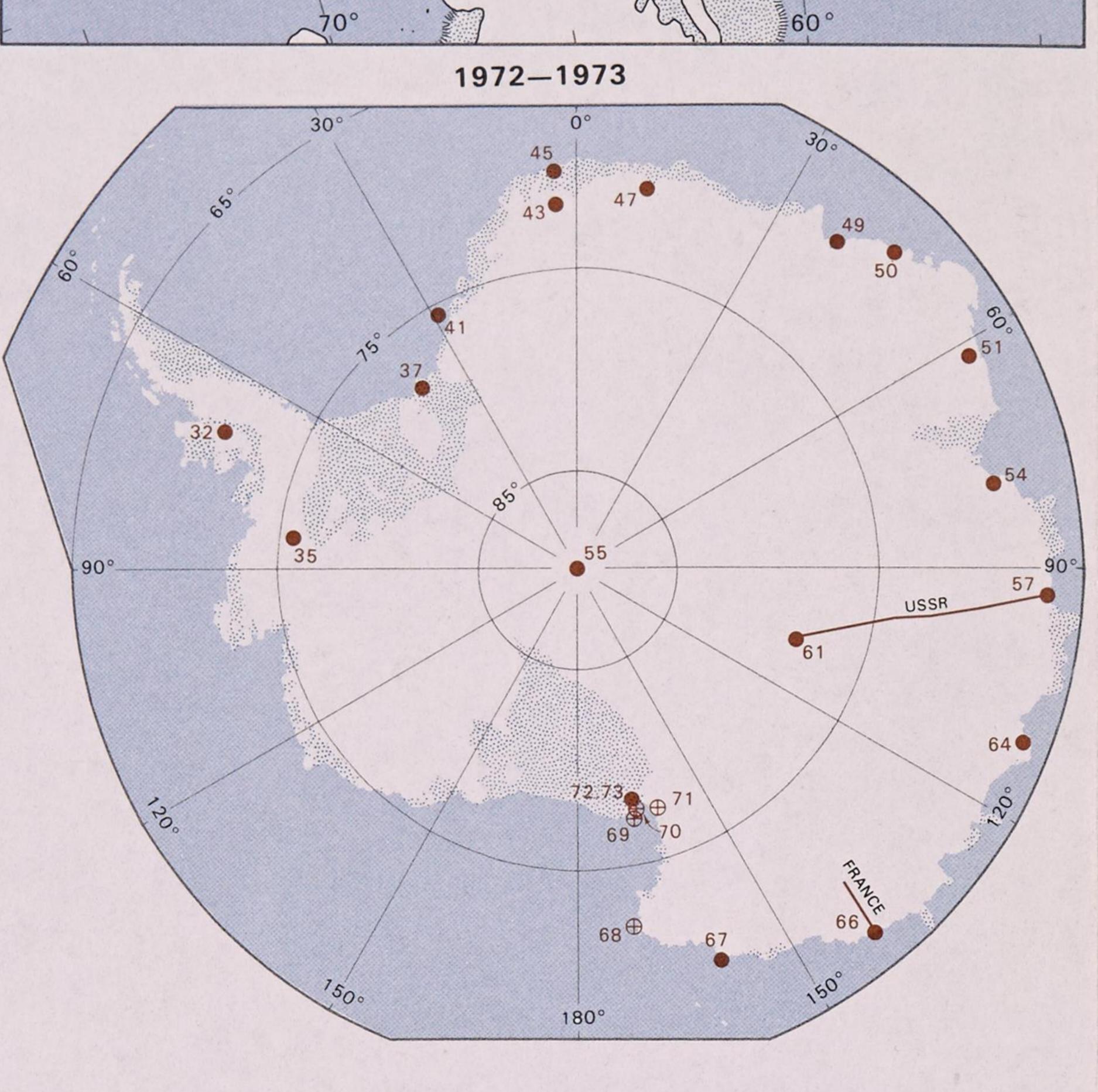
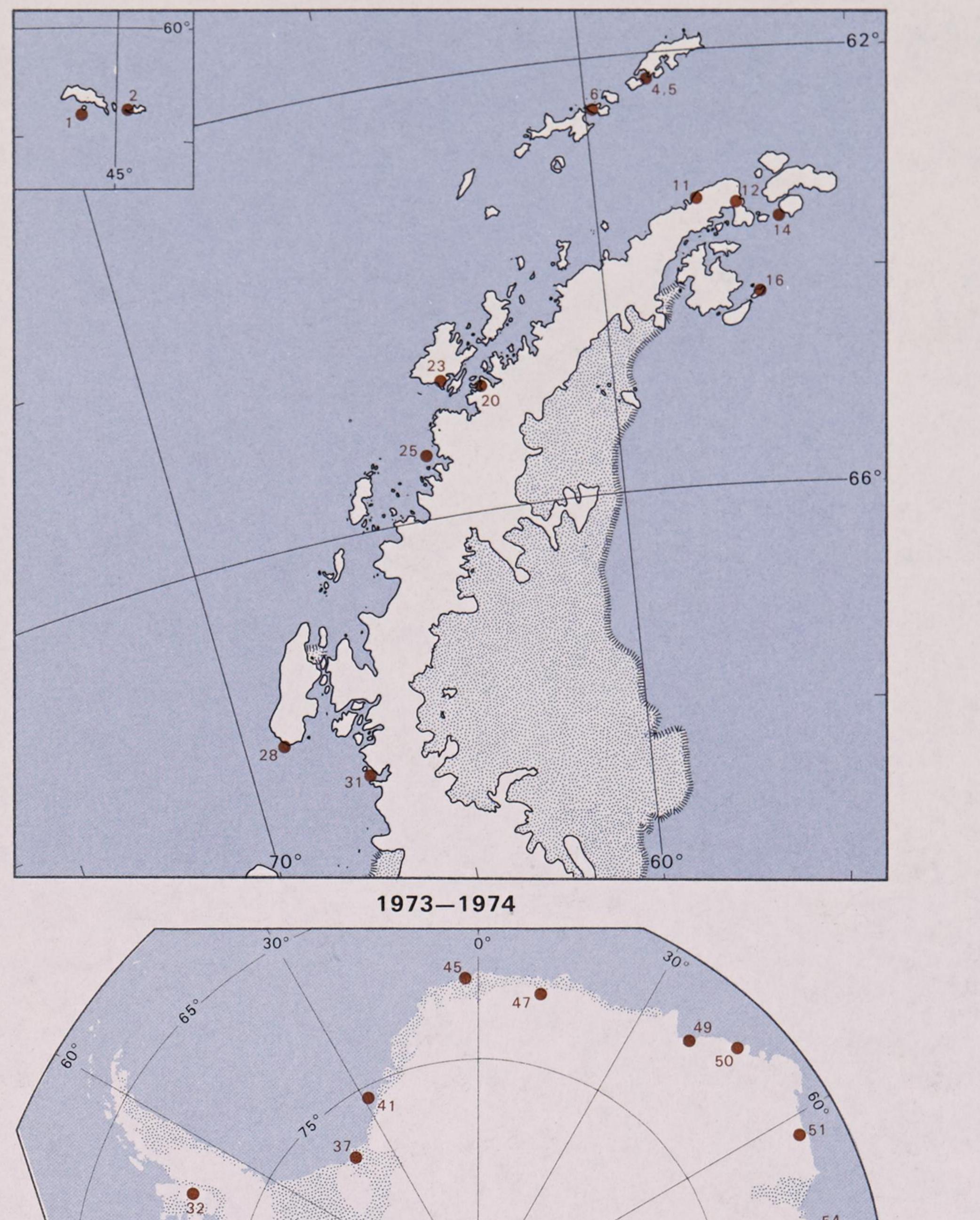
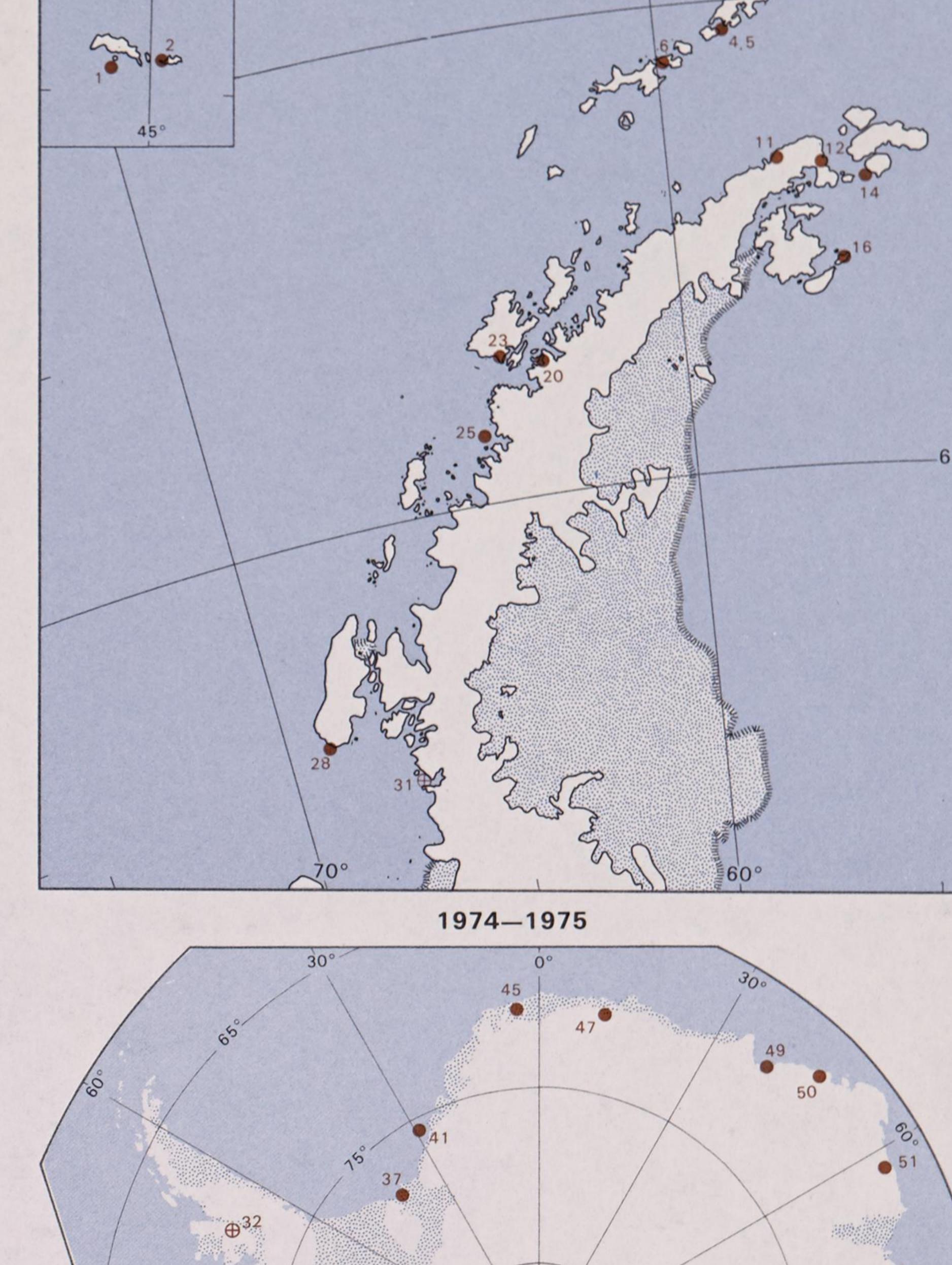


66° 45° 66° 66° 66° 1972—1973







NOTE

A year is taken to be a summer and the winter following; for example,

1954–1955 designates summer 1954–1955 and winter 1955.

— scientific traverse ● year-round station ⊕ summer station
Numbers by station symbols refer to table on Plate 10.

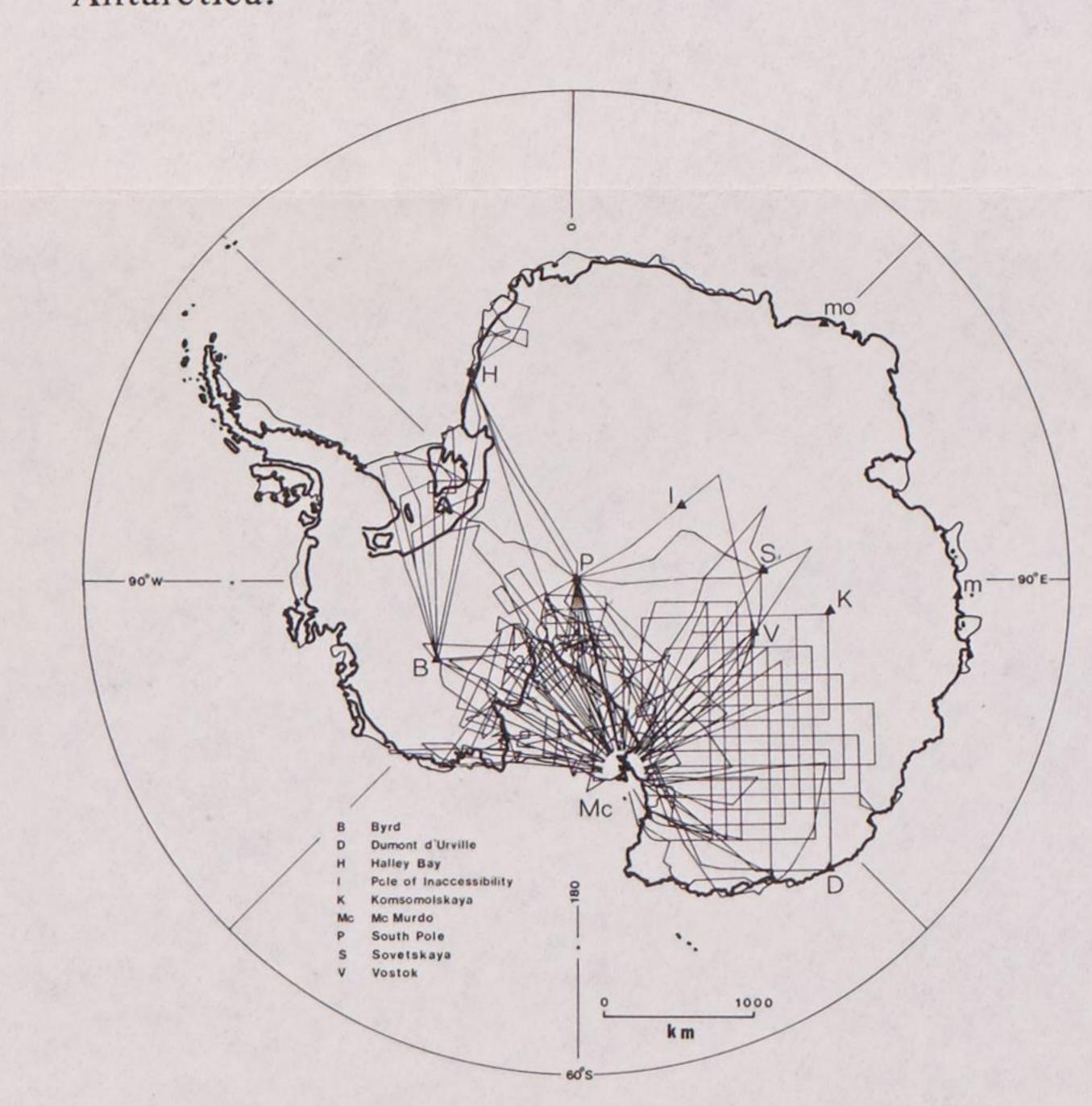
1971-1972

Scientists from Japan, New Zealand, and the United States initiated the Dry Valley Drilling Project, a program to examine subsurface geological and geophysical features on Ross Island and in the ice-free valleys west of McMurdo Sound. Field activities were devoted to preliminary investigations.

For the International Antarctic Glaciological Project, Soviet scientists journeyed 170 km from Mirnyy on the first leg of a traverse to Vostok. Their observations included seismic and radio-echo soundings, magnetic readings, and measurements of snow accumulation, density, stratigraphy, and temperature. Lasers, used for the first time in 1970-1971 to study glacier movement, were used more extensively this year. Coring at Vostok was extended to a depth of 952 m. Both the Soviets and the Australians conducted glaciological investigations in the region of the Lambert Glacier and the Amery Ice Shelf. A French party made an 800-km glaciological traverse from Dumont d'Urville toward Vostok Station with logistic support from the United States.

From their summer base on the Amery Ice Shelf, Soviet scientists were airlifted to mountains in Mac.Robertson Land for geological and biological investigations.

Between November 1971 and January 1972 the U.K.-U.S. airborne radio-echo sounding program was flown 57,000 km. Ice thickness measurements were obtained over more than 70 percent of the flight pattern. The greatest ice thickness measured was 4540 m at 77°30′S, 117°30′E. Data obtained added to the knowledge of the extent and topography of the subglacial "Gamburtsev" mountains in East Antarctica.



Flight lines along which airborne radio-echo soundings were made in 1967, 1969–1970, and 1971–1972 by U.K. scientists in U.S. aircraft. Map is from S. Evans and G. de Q. Robin, 1972: Antarctic Journal, Vol. 7, No. 4, p. 109.

Following a conference in London, representatives of the Antarctic Treaty nations recommended to their governments the Convention for the Conservation of Antarctic Seals, an agreement to ensure that if commercial sealing begins on the sea ice surrounding Antarctica, the killing of certain species will be prohibited and the taking of others will be subject to strict limits.

New Zealand scientists initiated a shallow-diving program at Cape Bird for underwater research. After fifteen years of operation, the U.S. Byrd Station was closed on January 1, 1972. Light sea-ice conditions made it possible for British supply ships to move freely in most areas. As a result, several new huts were built at U.K. stations on the Antarctic Peninsula.

After an absence of seventeen months, including nearly three weeks locked in the ice aboard the icebreaker *Fugi*, members of the Japanese Research Expedition reached Tokyo by air on April 29, 1972. Their scientific activities in the Antarctic had included glaciological studies at a station southeast of Showa and upper-atmosphere rocket soundings at Showa.

1972-1973

Drilling was initiated in the New Zealand-Japan-United States Dry Valley Drilling Project. Cores were obtained of volcanic rock from two drill holes on Ross Island. Both holes were in permafrost but neither reached its base, which is estimated from temperature measurements to lie 300 m to 350 m below sea level. The holes reached depths of 201.5 m and 179.4 m below the drilling platforms.

A traverse planned in connection with the International Antarctic Glaciological Project was only partially successful. A French party, with U.S. logistical support, had planned to remeasure the 800-km route taken in 1971–1972 from Dumont d'Urville and to extend measurements another 850 km to Vostok. The party had to turn back after traveling only 400 km because of damage to the tracked vehicles, caused by rough terrain.

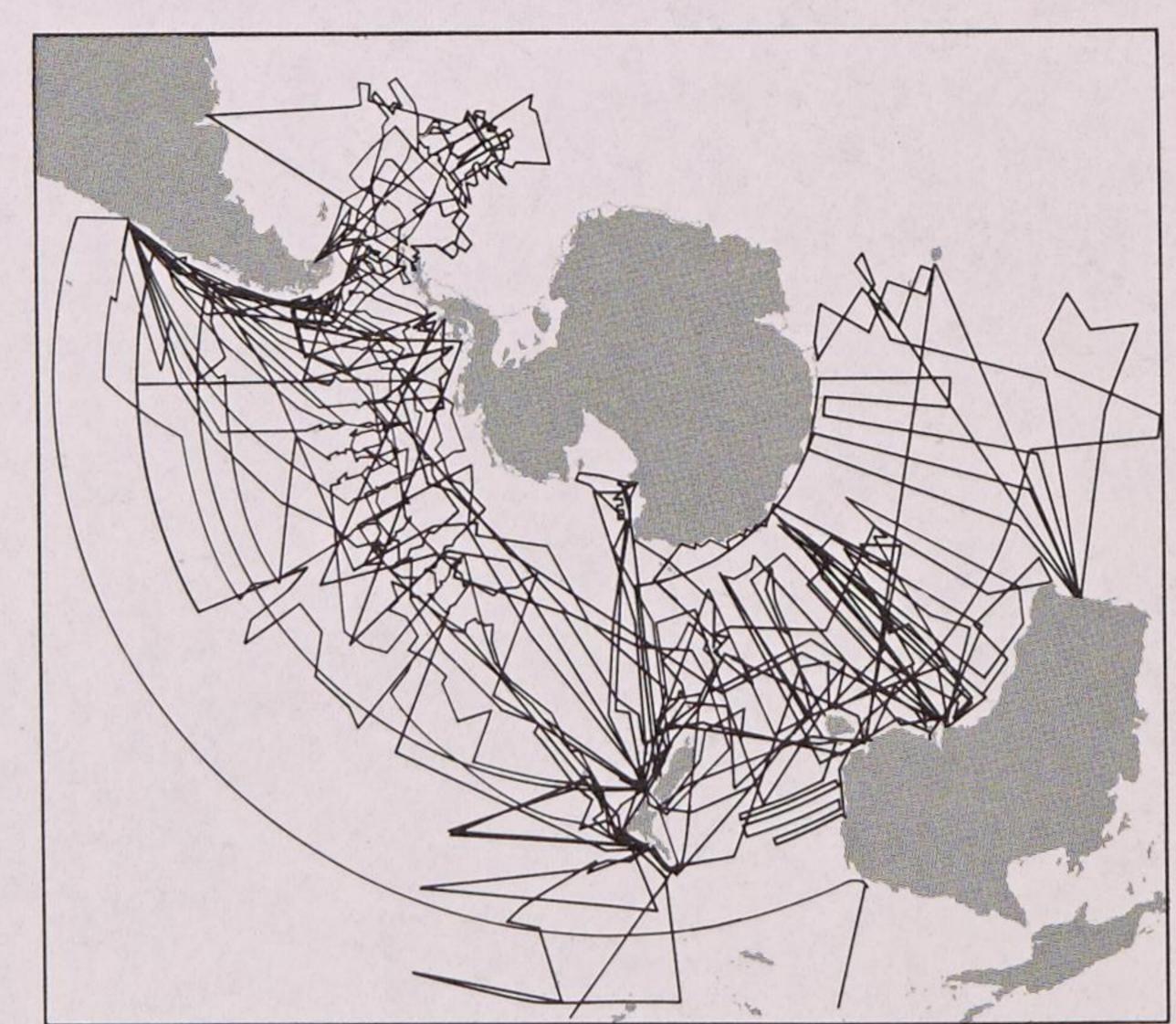
At Casey Station, Australians recovered most of the ice core from four holes drilled to depths of between 50 m and 100 m. A Casey wintering party made a trilateration survey in the region of Law Dome, an ice dome at 66°44′S, 112°42′E; U.S. satellite navigation was used. The Soviet program included drilling at Vostok Station, a glaciological traverse from Mirnyy to Pionerskaya, and experiments with a new technique of measuring ice velocity at Mirnyy. On the traverse, strain grids were set up at points 153 km and 355 km from Mirnyy and a hole was cored to 70 m at the 355 km point. The Soviets also measured snow accumulation along the route from Mirnyy to Vostok.

A Weddell Sea International Oceanographic Expedition was carried out this year by the U.S. icebreaker *Glacier* with scientists from Norway, Canada, and the United States. Two of the four

current meter arrays emplaced in 1968 were retrieved. They were found to have recorded the first winter data from the Weddell Sea.

The U.S. deep-sea drilling ship Glomar Challenger worked off Wilkes Land and in the Ross Sea. Analysis of sediment cores obtained in the Ross Sea showed that extensive glaciation began at least 20 million years ago and climaxed 4 or 5 million years ago, after which the ice sheet shrunk abruptly to its present size.

At the completion of cruises totaling more than 400,000 miles, the U.S. research ship *Eltanin* was placed in ready reserve at the end of December 1972. *Eltanin* had spent ten and a half years in a systematic, multi-disciplinary survey of approximately 80 percent of the waters south of 35°S.



Tracks of the USNS *Eltanin's* 52 cruises between July 5, 1962 and December 29, 1972. Map is adapted from cover of *Antarctic Journal*, 1973, Vol. 8, No. 3, an issue devoted almost entirely to summaries of research results based on data obtained during *Eltanin* cruises.

An icebreaker-supported census of seals was extended by U.S. scientists into the pack ice off the Oates and George V coasts. A study of the ecosystems of the dry valleys west of McMurdo Sound was begun by a U.S. party including, for the first time, undergraduate women and men.

The South African National Antarctic Expedition field-tested a new tracked vehicle. The enclosed vehicle, which carried scientific equipment and sleeping facilities for three persons, was expected to be used for a radio-echo sounding program. The U.S. Siple Station was occupied as a winter station for the first time. The nuclear power plant at McMurdo Station was closed down because of malfunctioning, and plans were made for dismantling it.

Attempts by the U.S.S.R. to establish a station, Russkaya, on Hobbs Coast in Marie Byrd Land were only partially successful because of bad weather and unfavorable sea-ice conditions. Huts, food, and some equipment were transported to the site by heli-

copters from the supply ship, but completion of the station was postponed.

To learn more about the weather and ocean currents around Antarctica scientists of several nations placed transponder beacons on icebergs, These electronic devices receive signals from a satellite and transmit replies automatically. The program was initiated by the French National Space Research Center, which supplied the instruments.

1973-1974

In December 1973 Argentina and the United States agreed to cooperate in operating and maintaining the research ship *Eltanin*, which had been inactive for a year. The arrangement was planned to run for five years and provide 200 days per year of Antarctic research. Research time would be shared by United states and Argentine scientists. The Argentine navy renamed the ship *Islas Orcadas*.

The interdisciplinary Ross Ice Shelf Project placed a party in the field from December 1973 to February 1974. Aircraft support facilitated the season's accomplishments. Data obtained at a network of stations resulted in preliminary maps of ice thickness, depth of sea floor below sea level, and thickness of the water layer beneath the ice shelf. Glaciological strain networks were established and observations were made of ocean tides beneath the ice shelf.

In the Japan-New Zealand-United States Dry Valley Drilling Project, five holes were bored to depths ranging from 38 m to 381 m with good recovery of cores, which were sent to home institutions for study.

Japanese scientists drilled 87 holes through the ice to the bottom of Lake Bonney in Taylor Valley and concluded that at least two million tons of salt lies below the lake bottom.

An Australian traverse from Casey station was in the field from October 1973 to January 1974. The party resurveyed a trilateration network established the previous year, extended it to about 69°S, and set out additional markers. A U.S. team measured ice movement along the traverse and in an area near Casey Station. A hole was cored to 350 m in the ice of Law Dome near Casey Station. On the Adélie Coast, a French drilling team sank a hole through the ice to bedrock, a depth of 305 m. The ice core was recovered for study. U.S.S.R. field parties measured snow accumulation and density along a traverse from Vostok to Mirnyy, and obtained radio-echo soundings of ice-sheet thickness along lines from their camp on the Amery Ice Shelf to the Pole of Inaccessibility and from the Amery base to Mirnyy and thence to Lambert Glacier and back to the Amery base. In addition, an areal survey was made of margins of the ice sheet in Mac.Robertson Land.

The first detailed map of the surface and bedrock topography for a large portion of East Antarctica was published in the U.K., a result of many years of cooperation between the U.S. and

the U.K. in airborne radio-echo sounding. No radio-echo sounding flights took place in 1973-

Soviet trawlers equipped to produce protein-rich paste from shrimplike crustaceans known as krill operated in Antarctic waters. Processed krill is marketed in the Soviet Union.

A party of five Italians, the first to work in Antarctica, studied the glacial morphology, petrography, geochemistry, and micrometeorology of the dry valleys west of McMurdo Sound. In December 1973, an Argentine air force C-130 transport plane flew from Buenos Aires on the first Argentine intercontinental flight via the South Pole. The flight was part of a study of the feasibility of developing a commercial route between South America and Australia

Australia established a new biological laboratory at Davis Station. A new laboratory for environmental and biological studies was constructed by the Japanese at Showa. A Japanese field party carried out a traverse in the vicinity of the Queen Fabiola (Yamato) Mountains. An important achievement was the resurvey of a 250-km-long strain grid to determine ice movement during the period since the grid was established in 1970.

The Glomar Challenger visited the Drake Passage and Scotia Sea on Leg 35 of its Deep Sea Drilling Project.

1974-1975

Three research ships participated in an expedition to the Drake Passage and Scotia Sea: Conrad (Lamont-Doherty Geological Observatory), Melville (Scripps Institution of Oceanography), and Islas Orcadas (Argentine navy). The goal of the program was to study ocean dynamics and its possible role in world weather and climate.

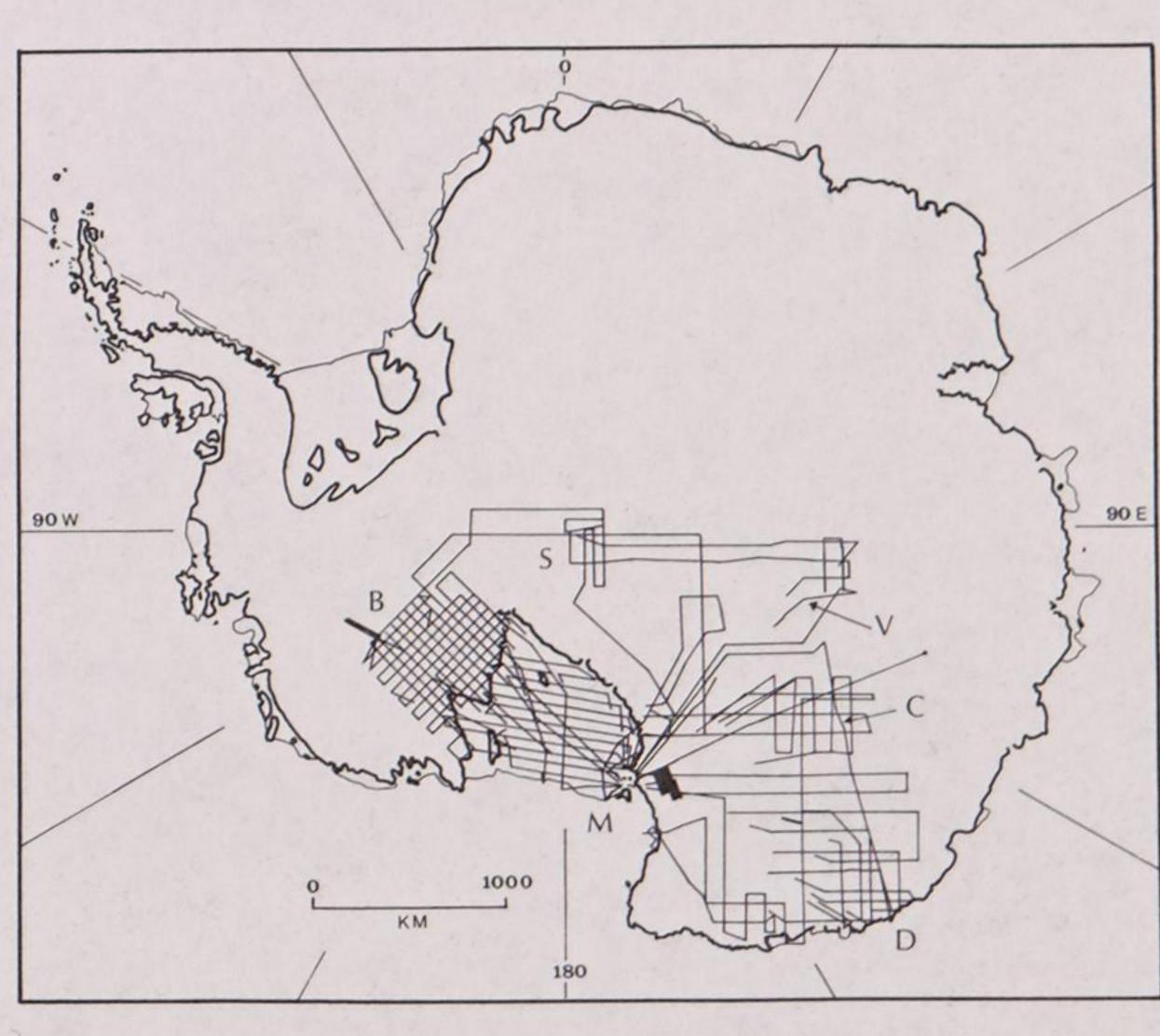
A French party made a glaciological reconnaissance of an ice dome (dome C) at 74°39′S, 123°10′E. A U.S. topographic engineer and a Soviet exchange scientist with the U.S. Antarctic Program participated. Personnel and equipment were transported to dome C by U.S. aircraft. During evacuation, two U.S. LC130s were damaged and left in the field. Other French activities included measurement of snow accumulation and determination of the rate of ice flow on the Adélie Coast.

At the U.S. Amundsen-Scott South Pole Station, a detailed sampling program was conducted in pits and shallow drill holes. A Soviet party continued a radio-echo-sounding traverse started in 1973–1974. Ice-sheet thickness was determined by this method at 586 sites along a 155-km southerly journey from Mirnyy. A hole 105 m deep was cored near Vostok, and snow depth was measured once again along the route from Vostok to Mirnyy. An Australian team cored two holes at Casey Station to about 350 m, not quite to bedrock. One hole was filled with a fluid to prevent closure so that temperature,

inclination, and diameter measurements could be made at a later date for comparison with those at the time of coring. An Australian party resurveyed the first 70 km of the 1973 trilateration net south of

Casey Station to determine ice movement.

Airborne radio-echo sounding of the Antarctic ice sheet continued in a cooperative program of the U.K. and the U.S., with equipment designed and built by the Technical University of Denmark. A total of 332 hours were flown in a U.S. airplane, resulting in approximately 135,000 km of ice-thickness profiling.



Flight lines along which airborne radio-echo soundings of ice-sheet thickness were obtained in 1974-1975. Map is from G. de Q. Robin, 1975: Antarctic Journal, Vol. 10, No. 4.

In December 1974, a New Zealand team drilled through sediments and bedrock to a depth of 328 m in Taylor Valley. This was the deepest of five corings completed in the Dry Valley Drilling Project this season. The other holes ranged in depth from 75 m to 206 m with a total of 872 m drilled. Cores were shipped out of Antarctica for study.

The Ross Ice Shelf Project had its second year of field work. Twenty-eight participants from eight institutions and three nations worked on the project itself, while another five scientists from three nations worked on related activities. Five camps were set up in addition to the 1973-1974 base camp. Activities included a resurvey of strain networks, a radio-echo sounding survey, and a geophysical and glaciological survey in the vicinity of Ross Island.

After seventeen years of occupation, the U.S. Amundsen-Scott South Pole Station had become unsafe because it was slowly being crushed under the weight of 10 m of snow. A new station, about 1.5 km from the old one, was dedicated in January 1975. The new station is a complex of buildings housed beneath an aluminum geodesic dome 50 m in diameter and 16 m high, and a corrugated steel arch 14 m in diameter and 244 m long, including all of its arms.