

ANTARCTIC

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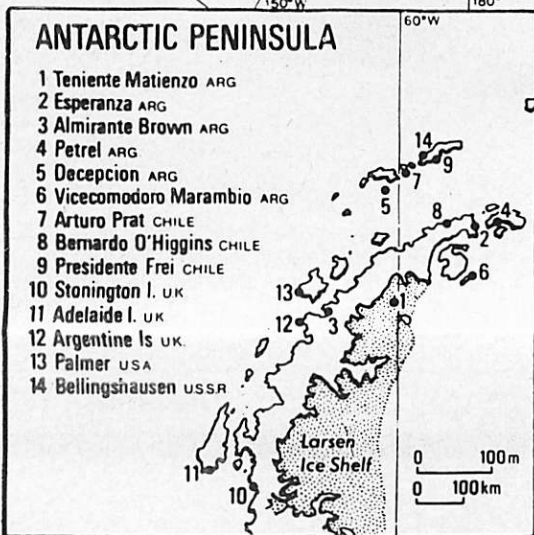
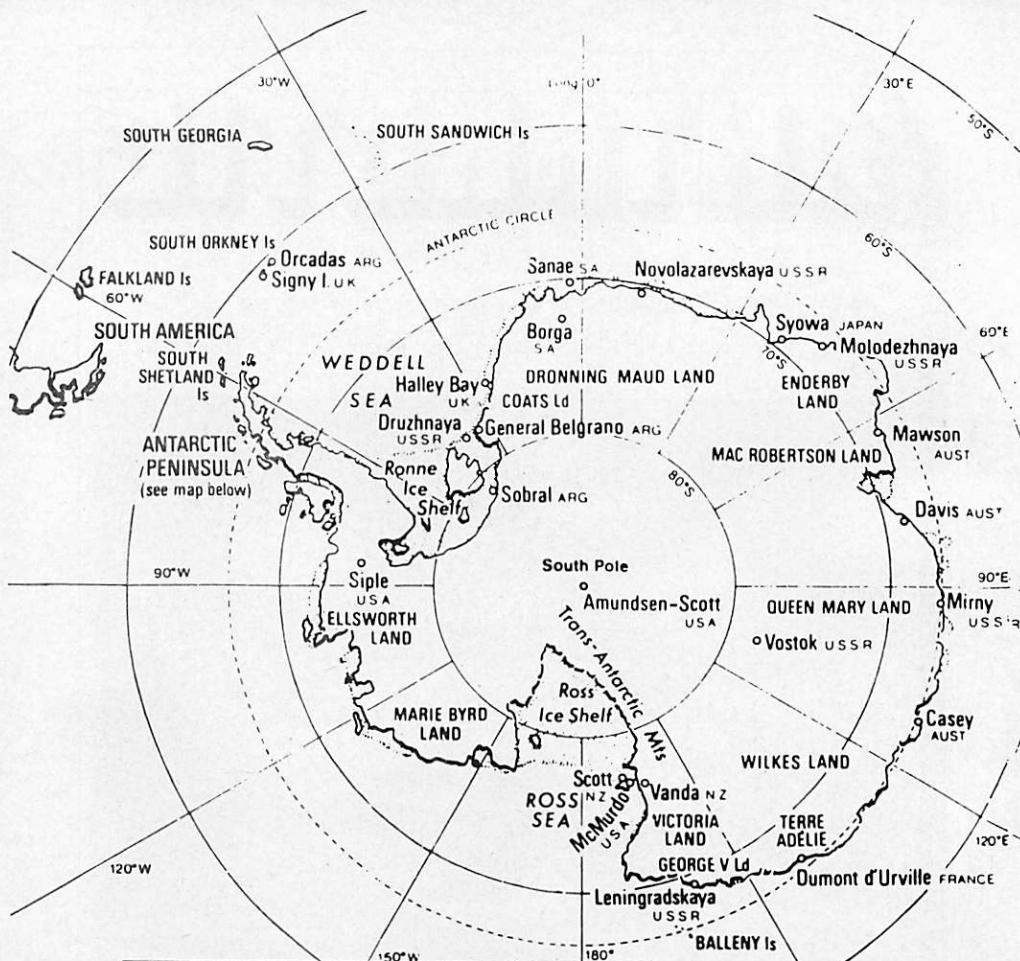
Eight years of exposure to wind and snow on the Polar Plateau have almost completely buried this United States Navy Hercules in the ice of Wilkes Land. It crashed at 68deg 20min S on December 4 1971 when supporting French traverse. The photograph was taken four years after the crash by another French traverse party.

Expeditions Polaires Francaises photo

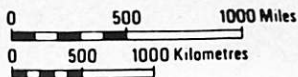
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ANTARCTICA



ABBREVIATIONS

- ARG ARGENTINA
- AUST AUSTRALIA
- NZ NEW ZEALAND
- SA SOUTH AFRICA
- UK UNITED KINGDOM
- USA UNITED STATES OF AMERICA
- USSR UNION OF SOVIET SOCIALIST REPUBLICS

ANTARCTIC

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NEW ZEALAND FIELD WORK BEGINS

New Zealand's Antarctic research programme for 1979-80, which began officially on October 8, was not materially affected by the Air New Zealand DC10 crash on Mt Erebus last month. Although the resources of Scott Base were concentrated on the search and recovery operation for 10 days, and pressure on base facilities caused one project to be cancelled, and another to be delayed, the first part of the programme was in full swing by the middle of this month.

Five days before the DC10 crash, however, early movement of the annual sea ice in McMurdo Sound caused the abandonment of the largest project undertaken so far — drilling two holes into the seafloor to obtain core samples of sediments which can provide a record of the early history of Antarctic glaciation. Drillers working from an ice platform 22km south-east of Marble Point and 80m west from Scott Base expected to reach the pre-glacial strata beneath the seafloor at 280m but were forced to stop 50m short of the scientists' target.

Because the drilling programme for the project known as the McMurdo Sound Sediment and Tectonic Study had to be completed early this month while the sea ice was still firm, the second stage of the project also had to be abandoned. Another hole was to have been drilled below the seafloor at a site known as MSST2, which is 16km into New Harbour near the main drilling supply depot at Rig Point on the mainland.

Drilling from the rig at MSST1, which was established on 2m of sea ice, began on October 18. Three days later the drill bit passed through 194m of water to reach the seafloor. The first geological core samples were extracted the next day, and by November 11 the drill bit was 168m beneath the seafloor.

ICE PLATFORM

Living and working on an ice platform with 194m of water beneath them, the Ministry of Works drillers encountered substantial problems in cold, difficult,

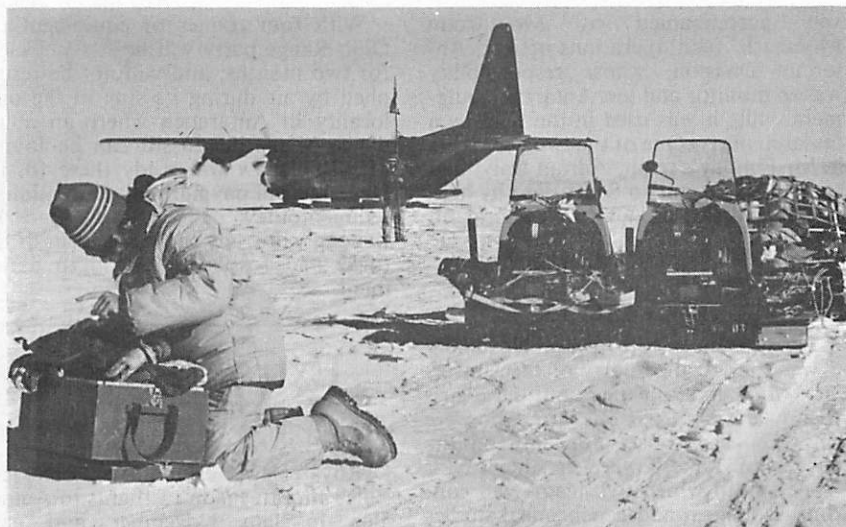
and trying conditions. Lower temperatures affected the drilling equipment, and the drillers were hampered by broken ground under the seafloor, scattered boulders in the mud of the glacial moraine, and cracks in the strata which prevented proper circulation of mud and water in the drill hole.

There was a sudden emergency on November 16 when the drillers had reached a depth of 200m. Drilling stopped because the drill bit struck soft mud and sand which produced continual cave-ins of the drill hole. The solution to the problem was found in New Zealand — a supply of bentonite clay from north of Christchurch.

A consignment of 240kg of bentonite, which is used in oil drilling operations, was sent south by the first Royal New Zealand Air Force Hercules flight to Antarctica on November 17. The bentonite was taken 80m over the ice from Scott Base to the drill site, and was pumped into the drill hole to provide a firm wall and enable the drilling to continue through the sandy layer deep in the seafloor.

DRILL BIT BENT

Drilling stopped completely on November 23 when an apparent obstruction was encountered. Inspection revealed that the drill bit had been bent to five degrees as a result of movement of the sea ice which put the drilling rig platform out of alignment with the drill hole. Although the drillers had reached a depth of 230m the obstruction occurred only 6m below the surface.



One of New Zealand's most remote field parties at the beginning of its research in the Ohio Range of the Horlick Mountains 525km from the South Pole. The United States Navy Hercules which landed the party in the area last month is ready to return to McMurdo Station. Mrs Margaret Bradshaw, leader of the party, is in front of the aircraft with the expedition flag. On the left Graeme Ayres, an Antarctic Division field leader, checks the field radio.

Antarctic Division photo.

Scientists and drillers at MSSTS1, a joint project by the Antarctic Division, Victoria University of Wellington, and the Ministry of Works, were disappointed not to reach their target. But the data obtained from the 230m core is expected to provide much information about the development of the Antarctic ice sheet, the flora of old Antarctica, and more recent geological events in the Ross Sea area. The core is older than any previous Antarctic geological core, and rock samples brought up during the drilling are estimated to be about 16 million years old.

After the drilling project ended four drillers remained at the site until early this month. Assisted by members of the Antarctic Division staff under the supervision of the project manager, Mr Gertl Varcoe, they dismantled the rig and other equipment, and transported it across the sea ice of McMurdo Sound to Scott Base.

In the first two months of the new season New Zealand field parties started

to move out from Scott Base to the dry valleys of Southern Victoria Land, the Ellsworth Mountains, the Ross Ice Shelf, and to a remote field camp in the Ohio Range of the Horlick Mountains only 525km from the South Pole. They were transported to their research areas by United States Navy aircraft and helicopters. Other teams in the programme began their research at or from Scott Base, and in McMurdo Sound.

One of the early parties in the field was the geological expedition led by Mr R. H. Findlay, of the Antarctic Division, who left Scott Base on November 1 with two motor toboggans and three sledges on a two-month journey to the Blue Glacier region about 80km west of Ross Island. Its mission was to make a geological analysis of the metamorphic rock in the Blue Glacier region of the Royal Society Range, and to continue the New Zealand programme of geological mapping of the Ross Dependency.

For the first 10 days the expedition

was accompanied by Mr Colin Monteath, field operations officer, Antarctic Division, whose responsibility was to monitor and test Antarctic equipment while it was used in the field by a research party. One of the two geologists in Mr Findlay's team, Adrian Daly, had to be brought out to Scott Base by helicopter and flown back to New Zealand when his toes became frostbitten. He was replaced by Mr J. McConchie.

DRY VALLEYS

Next to leave Scott Base on November 5 was the advance party of the University of Waikato expedition, Dr Chris Henty and Mr Colin Rickard, who were on their way to set up camp on the shores of Lake Fryxell in the Taylor Valley from which two teams will conduct ecological and geochemical studies of lakes in the dry valleys. Four Scott Base staff accompanied the party on the journey across the sea ice of McMurdo Sound to the western shores. There United States Navy helicopters were used to shuttle the expedition's equipment over mountainous passes into the Taylor Valley.

Another party which will remain in the field until January next year was flown more than 1300km from Scott Base to the Ohio Range of the Horlick Mountains. The leader of the party is Mrs Margaret Bradshaw, the Canterbury Museum's geologist, who is on her third visit to Antarctica. With her are two Americans, Dr Lucy Force and Dr Karl Kellogg, of the United States Geological Survey, and a Mt Cook National Park ranger, Mr Graeme Ayres, who is the field leader.

SECOND ATTEMPT

A United States Navy ski-equipped Hercules landed the party at a height of 2000m on the Polar Plateau just after five o'clock on the morning of November 20. It was the aircraft's second attempt to land in the Ohio Range. The first attempt was aborted when the Hercules was prevented from landing by 50-knot winds sweeping across the Polar Plateau.

With four tonnes of equipment the Ohio Range party will be self-sufficient for two months, and will not be resupplied by air during its stay in the only locality in Antarctica where an abundance of marine fossils can be found. Mrs Bradshaw will study these fossils, Dr Force will pay particular attention to sedimentology of the area, and Dr Kellogg will study the magnetism of the rocks and fossils as an aid to dating them.

Extra flights by RNZAF

Royal New Zealand Air Force Hercules aircraft made 13 flights to Antarctica in late November and early December this season as part of New Zealand's contribution to the United States-New Zealand logistic pool for the transport of men and supplies from Christchurch to McMurdo Station. Originally No. 40 Squadron was to have made nine flights in Operation Ice Cube, three less than last season, but it was called on to make four more because of the Air New Zealand DC10 crash on Mt Erebus.

A Royal Australian Air Force Hercules joined the logistic pool this season under a tripartite agreement which provides for Australian scientists to be flown from McMurdo Station to Casey Station by United States Navy ski-equipped Hercules aircraft. The Hercules made six flights between Christchurch and McMurdo Station. Two of them were training flights.

As in past seasons four RNZAF Iroquois helicopter pilots and two crewmen were attached to the United States Navy's VXE-6 Squadron. Flight Lieutenants I. O. McLeod and D. J. Watson, and Sergeant E. K. J. Shangs, began their tour of duty in Antarctic last month. They were replaced early last month by Flight Lieutenant J. Cole, an RAAF pilot serving on exchange with the RNZAF, Flight Lieutenant A. W. Lloyd, and Sergeant C. P. Barnett.

Frostbitten geologist evacuated

One of three geologists in an Antarctic Division expedition to the Blue Glacier region had to be brought out from a field camp at the head of the Salient Glacier by a United States Navy helicopter last month and flown to Christchurch for hospital treatment when he was found to be suffering from frost-bitten toes. Mr Adrian Daly, aged 24, of Hamilton, reached McMurdo Station on August 15 and was transferred to a United States Air Force Starlifter, which arrived in Christchurch the next morning.

Led by Mr R. H. Findlay, of the Antarctic Division, the party, which included Mr Ken Brodie (geologist) and Mr Geoff Hill (field leader) left Scott Base on November 2. Using motor toboggans and sledges, the four men reached the Blue Glacier area on November 5 and established a base camp.

On November 15 the party reported to Scott Base that it was camped in bad weather at the head of the Salient Glacier, about 120km from the base. Although Mr Daly had mentioned that he had been suffering a little from cold feet, the seriousness of his condition was not established until the morning of November 15. Arrangements were then made by field radio for an immediate evacuation.

Mr Daly was expected to remain in hospital for treatment for some weeks. His place in the expedition was taken by Mr J. McConchie, who had been working as a field assistant with a New Zealand Oceanographic Institute project in McMurdo Sound. He joined the party a week after Mr Daly returned to New Zealand, being taken by helicopter to a field camp on the Walcott Glacier.

West Germans begin field work

Field parties from the West German expedition to Northern Victoria Land were at work soon after the Schepelsturm reached the Cape Hallett area in the second week of December. New Zealand Hughes 500 helicopters chartered by the expedition flew one party to Football Mountain, an 822m peak on a ridge between Edisto Inlet and the Tucker Glacier, and the other to Cape Klovstad at the southern extremity of Robertson Bay.

Less than six days after she sailed from Timaru the Schepelsturm was reported to have stopped in pancake ice 16km east of Cape Hallett. Her position on the morning of December 12 was 72deg 2min S/171deg 19min E.

Football Mountain was used as a survey point by a New Zealand geological expedition in the 1957-58 season. It has a prominent rock scar on the north side which the expedition named The Football. Cape Klovstad is between the Murray and Newnes Glaciers. It was charted in 1899 by the Southern Cross Expedition to Cape Adare led by C. E. Borchgrevink, and was named

after Dr Herlofk Klovstad, the expedition's medical officer.

After the field parties have finished their work the Schepelsturm will proceed north to Cape Moore. Then she is expected to move into Smith Inlet from where the expedition will use its helicopters to establish a field camp at the base of the Lillie Glacier.

Winter team of 10

Ten men will winter at Scott Base next year under the leadership of Mr C. A. Roper, of Christchurch. The 10th member of the New Zealand team, Mr David Reese, of Te Anau, was chosen last month.

Mr Reese, who comes from Murchison, worked as a park assistant for the Fiordland National Park Board at Te Anau before he went south. He is an assistant maintenance officer at Scott Base, and has worked with the McMurdo, Sound Sediment and Tectonic Study.

Graeme Keown, of Palmerston North, who has been the base storekeeper this summer will also join the winter team.

Plane crash on Mt. Erebus kills 257

Antarctica's active volcano, Mount Erebus, claimed the lives of 257 men, women, and children, on November 28 when an Air New Zealand DC10 on a scenic flight crashed on the north-east side of the mountain at a height of 457m. The aircraft, which carried 237 passengers from eight countries, and a crew of 20, was on the last of four flights made to the McMurdo Sound area last month.

Of the 237 passengers who died in the crash 178 were New Zealanders, 26 Japanese, 21 Americans, six British, two Australian, two Canadian, one French and one Swiss. The crash was the worst disaster in New Zealand's history, the third worst international air disaster, and the worst in 25 years of aviation in Antarctica.

One of the victims was the commentator, Peter Mulgrew, who was the radio operator, with the New Zealand party led by Sir Edmund Hillary which reached the South Pole by land in 1957-58. A noted mountaineer and yachtsman, 52-year-old Mr Mulgrew, who accompanied Sir Edmund Hillary on several expeditions to the Himalayas, was on his fourth flight with Air New Zealand as a commentator for the Antarctic day trips.

Air New Zealand's DC10 left Auckland at 8.20 a.m. (N.Z. time) for McMurdo Sound on the scenic flight which was to include 45 minutes of sight-seeing over Ross Island, Scott Base, McMurdo Station, and other features in the area, including Erebus. As on all previous flights it was expected to land at Christchurch soon after 7.00 p.m. to discharge local passengers and refuel for the flight back to Auckland.

On the 8000km Antarctic flights, which began in 1977, each DC10 carried 109,000kg of fuel, and kept a minimum of 51,000kg for the return journey to New Zealand after the 45 minutes over McMurdo Sound. Fears for the safety of the aircraft on November 28 were confirmed by 9 p.m. when the DC10 was nearly two hours overdue, and its fuel reserve was almost exhausted. By 10 p.m. Air New Zealand accepted that the aircraft was officially lost.

Far to the south the United States naval support force on Ross Island had begun a search and rescue operation from McMurdo Station less than two hours after the last radio signal from the DC10 had been received at Williams Field. At 12.44 p.m. local time the pilot reported that he was 61km from Ross Island at a height of 1828m and was descending to 609m. Four minutes later the DC10 crashed on the north-eastern slope of Erebus, which rises to a height of 3794m.

NO RESPONSE

By 1.30 p.m. when the DC10 had not been sighted or responded to radio calls the search began. A United States Navy Hercules and two helicopters of VXE-6 Squadron flew out over McMurdo Sound but sighted nothing. On the way back to Christchurch later in the day a United States Air Force Starlifter which had followed the DC10 in to McMurdo Sound also searched the area without result.

Antarctic's perpetual summer daylight enabled the search to be continued into the early hours of November 29. Then at 12.56 a.m. the wreckage of the DC10 was sighted by a United States Navy Hercules. Several hours later three members of the New Zealand Antarctic Division's field staff from Scott Base, Hugh Logan, Daryll Thomson, and



New Zealand mountaineers probe a crevasse where the Air New Zealand DC10 crashed on Mt Erebus on November 28. Mr John Stanton, one of the members of the face rescue team, is controlling a rope secured to Mr J. R. (Harry) Keys while he checks the safety of snow bridges in the crevasse.

Antarctic Division photo

Keith Woodford reached the crash site by helicopter.

HIGH WINDS

Conditions were hazardous for the three experienced mountaineers with snow and winds gusting to 50 knots as the helicopter hovered over the steep and crevassed slope of Erebus where the DC10 had hit and exploded on impact. Wreckage was strewn over an area 600m by 100km, but the field team, which had landed at 10.45 a.m. was able to report by 11.32 a.m. that there were no survivors.

By the afternoon of November 29 crash investigators, police identification teams, and a New Zealand face rescue team, which included men with experience on Erebus in past seasons with New Zealand research projects, were on their way from Christchurch in a Royal New Zealand Air Force Hercules. Their task was to recover victim's bodies, and also to search the wreckage of the DC10 for the flight recorder and the cockpit voice recorder which might help to determine the cause of the crash.

A base camp was established 600m below the site of the crash, timber was flown to Erebus, 50km from McMurdo Station and Scott Base, to build a helicopter landing pad, and New Zealanders and Americans began their arduous and dangerous tasks. They were joined later in the week by crash investigators from the United States.

United States Navy helicopter crews flew mission after mission to Erebus, returning day and night with victims' bodies which were held in a temporary morgue at Williams field for transport to Auckland by RNZAF Hercules aircraft. At the crash site the grim search went on. To leave the officer in charge at Scott Base, Mr M. M. Prebble, free to co-ordinate the operation, Mr R. B. Thomson, superintendent of the Antarctic Division, took over his normal duties as leader.

Strong winds, low cloud, and snow, hampered the searchers, and grounded helicopters for one day, but later on the night of December 2 the flight recorder and the cockpit voice recorder were recovered undamaged within 15m of

each other. The voice recorder was found at 9 p.m. and the flight recorder two hours later. As the search went on aircraft instruments were also recovered from the snow-covered wreckage of the DC10.

WORK COMPLETED

By December 9 the work on Erebus was completed. One RNZAF Hercules flew to Auckland with the first bodies on December; a second arrived there on December 11. Because of the operational demands made on aircraft supporting the American and New Zealand programmes No. 40 Squadron was called on to make four additional flights, two of them to Auckland.

After the search and investigation teams had returned one task remained for the New Zealanders and Americans on Ross Island — the erection of a memorial cross on Erebus. Built at Scott Base, the cross bears a brass plaque. On it are engraved the words which follow.

"Sacred to the memory of the 257 passengers and crew of Flight NZ901 who died 1km from this site on November 28th, 1979.

Erected by the communities of Ross Island."

A simple ceremony to dedicate the cross, which also carries the DC10's registration letters ZKNPC, was held at Scott Base. Later the cross was flown to the slopes of Erebus by a United States Navy helicopter.

FLIGHTS SOUTH

Two international airlines — Air New Zealand and Qantas — began "day trips" to Antarctica in February, 1977. Air New Zealand's 13 flights before the crash were all to the Ross Dependency and the McMurdo Sound area, where the tourist attractions are Mt Erebus, the historic huts of Scott and Shackleton on Ross Island, the New Zealand and American bases there, and the strange dry valleys of Southern Victoria Land.

Qantas, which flew a Boeing 747B to the South Magnetic Pole on February 13 and 20, 1977, and introduced Antarctic "day trips" for tourists, had made 27 flights south before the DC10 crash. All

these flights were made on special charters or by arrangement with travel firms. The airline used Boeing 747 aircraft on most of the flights from Sydney, Melbourne, and Perth over a longer sightseeing route, and Boeing 707 aircraft on a shorter route for flights departing from Melbourne.

TWO ROUTES

Two sightseeing routes have been used by Qantas for its Antarctic flights since 1977. One follows the coast of George VI Land as far as the French base, Dumont d'Urville, in Adelie Land, and then back over the South Magnetic Pole. The other route is over Oates Land and Northern Victoria Land to Cape Washington at 74deg 30min S in the Ross Dependency. Only one flight by a Boeing 747 from Sydney by way of Melbourne on November 17, 1977, took passengers into McMurdo Sound and over Mt Erebus.

Until the crash on November 28 the two airlines had carried more than 10,000 passengers south on 40 flights. Qantas flights have taken an average of 300 passengers on the Boeing 747 flights, and 140 in the Boeing 707 aircraft. Air New Zealand's average loading in the DC10 has been about 230. As a result Qantas has carried more than twice as many passengers as Air New Zealand since 1977.

Last month's crash did not affect Qantas charter flights this month. Flights were made on December 2 and 9, and a third is planned for February 16 next year.

Historic huts project

Because of the pressure on facilities at Scott Base as a result of the DC10 crash on Mt Erebus the Antarctic Division has had to cancel the restoration and maintenance work at Scott's huts at Cape Evans and Hut Point, and Shackleton's hut at Cape Royds. Two members of the New Zealand Antarctic Society, Messrs Alan Wright and Gavin Dougherty, were to have flown south this month to act as caretakers of the three huts on Ross Island.

U.S. science projects this summer

This season the United States will spend about \$52 million on research in Antarctica, an increase of \$2½ million on last season's expenditure. The cost of the scientific programme, which is financed and co-ordinated by the National Science Foundation, includes \$33 million to support the research with aircraft, icebreakers, and cargo ships, and to maintain the four American inland and coastal stations.

About 300 scientists, including 25 women, and representatives of 10 other countries, are engaged in research on the continent, and in southern waters. With support by air and sea they are at work in Ellsworth Land, around the Antarctic Peninsula, at the South Pole, in Enderby and Victoria Lands, on the East Antarctic ice sheet, and in the Ross, Bellingshausen, and Weddell Seas.

There are 80 projects in the United States Antarctic Research Programme, and they include evaluations of Antarctica's mineral and marine living resources. One field team will make a marine geological survey of the Bellingshausen Sea, one purpose of which is to obtain information about the hydrocarbon potential of the Antarctic continental margin. Another team, which includes West German geologists, will continue a radiometric survey begun in the 1975-76 season to assess the potential resources of uranium and thorium in the exposed rocks of Antarctica. This season the survey has been extended to the Ellsworth Mountains.

On its marine geological cruise to the Bellingshausen Sea aboard the United States Coast Guard icebreaker Glacier a field team from Rice University, Houston, Texas, will examine sediment and faunal distribution patterns on a portion of the Antarctic continental margin bounded by mountains and valley glaciers. Piston cores taken throughout the Bellingshausen Sea from the Glacier are expected to provide information about past and present ice conditions, about the influence of tectonic elements upon terrigenous sedimentation, and about the hydrocarbon potential of the continental margin.

In past seasons the resource and radioactivity survey by a field team from the University of Kansas has covered the mountains of Victoria Land, exposed rocks in Marie Byrd Land, and the Darwin Glacier area. This season the team, using airborne gamma-ray spectrometers, will attempt to determine the distribution and concentration of radioactive elements in the folded sediments of the Beacon Supergroup in the Ellsworth Mountains.

URANIUM SITES

Much of the team's work will be concentrated in the northern Sentinel Range which is known to have carbon-bearing deposits that are potential sites for uranium. Objectives of the survey are: (1) to locate specific rock types which may have radioactive element concentrations, and to evaluate the geochemical characteristics of those rocks; (2) to provide fundamental geological information about specific rock types and conditions of deposition or crystallisation; and (3) to provide baseline radioactivity measurements that may ultimately serve as benchmarks for evaluating the environmental impact of human operation in Antarctica.

Marine resources of commercial interest are being studied again in the An-

tartic Peninsula area. Investigations of the biology of *Euphausia superba*, the dominant species of Antarctic krill, are designed to determine whether data obtained for krill in special aquaria at Palmer Station are applicable to the population as a whole. These studies are being supported by the research vessel Hero.

Another project conducted from the Hero in Drake Passage is expected to supplement knowledge of the primary productivity of the Southern Ocean. The Skidaway Institute of Oceanography in Savannah, Georgia, is interested in the adaptation and functional role of bacterial plankton as a food source and a consumer of dissolved organic matter in the Southern Ocean.

FOOD WEBS

Between mid-January and early March next year another team led by Dr Robert W. Risebrough will continue its study of flows of organic compounds through Antarctic food webs supporting and dependent upon krill. It will use the Hero to obtain water samples which will indicate the levels of petroleum-derived and related compounds, and synthetic and natural organic chemical compounds in marine food webs. The team will also make a detailed census of penguin colonies to obtain data that will provide a growth curve for Adelle penguin chicks, and possibly indicate present or future changes in the available food supply.

Largest of the 80 events in this season's programme is the Ellsworth Mountains Project, which has been planned to cover four seasons. It includes six geological and glaciological studies, and a search for meteorites, by scientists from several United States institutions, and West Germany, Japan, New Zealand, and the Soviet Union. The project began last month and will continue until the third week of January next year.

Located between the West Antarctic plateau and the Ronne Ice Shelf, the Ellsworth Mountains, which are about 2092km from McMurdo Station, are

divided into a northern range, the Sentinel, and a southern range, the Heritage Range. The mountains, which cover an area 354km long and 80km wide, occupy a strategic position as a bridge between geologically younger West Antarctica and the older areas of East Antarctica.

BASE CAMP

A base camp to accommodate a maximum population of 58 has been established in a flat area of the north-central Heritage Range. Buildings, supplies, equipment, and three helicopters to support 35 scientists working in the area have been flown to the Ellsworth Mountains from McMurdo Station by way of the old Byrd Station. This support has been provided by United States Navy Hercules aircraft of VXE-6 Squadron. Scientific field parties are using motor tobaggans and sledges for surface transport, and the helicopters, which have an operating radius of 185km, will be used to transfer the scientists to other sites.

Dr Gerald F. Webers, professor of geology at Macalester College, St Paul, Minnesota, is chief scientist of the project. As part of the geological investigation of the Ellsworth Mountains scientists will search for fossil plants and animals to obtain more clues about the evolution of life and the environmental conditions which existed millions of years ago in Antarctica. In addition, the fossils will supply reliable dates which can be used to interpret the geological history of Antarctica and its relationship to other continents.

Part of the Ellsworth Mountains Project is a study of the glacial history of the area. Because the Ellsworth Mountains occur precisely at the grounding line between the West Antarctic ice sheet and the Ronne Ice Shelf, they are ideal for monitoring ice advances and recessions in the Weddell Sea area.

To seek evidence that the West Antarctic ice sheet is disintegrating scientists from the University of Maine at Orono led by Dr George H. Denton will map glacial erosional and depositional features in the Ellsworth Mountains.

This is to reconstruct former ice sheet surfaces and chart their recessions. They believe that during glacial periods the West Antarctic ice sheet expands to the edge of the continental shelves in the Ross and Weddell Seas, and that during interglacial periods the sheet retreats to about its present position and maintains large ice shelves. During particularly warm interglacials, however, the last about 124,000 years ago, it is believed that the ice sheet loses its shelves and collapses rapidly.

This glaciological research has also been extended to the McMurdo Sound region. There Dr Denton's team has mapped the Upper Taylor and Wright Valleys, and the Mackay Glacier area to gain more data on the last advance of grounded ice in the Ross Sea.

Last season more than 300 meteorites ranging in size up to 150kg were found in southern Victoria Land by a United States-Japanese team which continued a search first started in the 1976-77 season. This season a team from the University of Pittsburgh led by Dr William A. Cassidy will concentrate its search in the Allan Hills and Mt Reckling areas northwest of McMurdo Station. It will also search near areas of glacial erosion in the Ellsworth Mountains.

Dr Fumihiko Nishio, one of the Japanese Antarctic Research Expedition participants in the United States programme, will search for meteorites in the Allan Hills area as he did last season. He will also assist in resurvey of the ice strain network placed there last summer. Later he will stay at Vanda Station in the Wright Valley to observe "ice shocks" at Lake Vanda.

DOME C

Scientists of four nations—Australia, France, the Soviet Union, and the United States, are engaged again this season in joint studies of the East Antarctic ice sheet which are part of the International Antarctic Glaciological Project. Much of the work is being done at Dome C, the ice dome in Wilkes Land 1150km from McMurdo Station which contains some of the world's thickest

known ice. A West German team will join United States and French teams at Dome C this summer.

A geophysical investigation of the Dome C area is being made by a University of Wisconsin team headed by Dr Charles R. Bentley. Its continuing programme includes studies of the internal layering of the ice sheet in addition to its thickness, detection of different temperatures, and magnetotelluric soundings to provide information about the rock under the ice.

Dr Ian M. Whillans is leader of the Ohio State University team which began a glaciological investigation of the ice dome area in the 1977-78 season. It is investigating the size and velocity of the ice sheet in the region to understand the past, present, and future behaviour of this and other ice masses. This month and next month the team will test whether the ice thickness and velocity in the Dome C area have changed over time, and study variations in bottom topography that must disturb glacial flow and so influence ice dynamics and calculations of the age of ice deep in the ice sheet.

DEEP SOUNDINGS

A West German team led by Dr F. Thyssen, of the Geophysical Institute, Munster, will conduct deep geo-electric soundings of the ice sheet near Dome C. Evaluation of similar experiments on the Greenland ice sheet has shown what appear to be two regions with different behaviour within the ice. The West Germans will use longer electrode spacings than those used in Greenland to determine if this difference in ice behaviour is also evident in the Antarctic ice sheet.

French scientists led by Dr Claude Lorius, of the Glaciological Laboratory, Grenoble, will collect shallow snow cores and samples from snow pits, and bring back ice cores from the hole drilled to a depth of 906m at Dome C in the 1977-78 season by another French team. The studies have been planned to determine the origins of chemical impurities in the ice and impurity changes over time, and also to note elevation changes in the ice sheet that indicate its stability.

To assist the glaciological studies at Dome C a shallow ice core drilling team from the University of Nebraska will collect ice core for scientists investigating the physical properties and chemical constituents of snow and ice from the polar ice sheets. Another drill crew will drill similar 100m holes at Siple, Byrd, and Vostok Stations for the same purpose.

SOLAR TELESCOPE

Direct optical observations of the sun will be made this season at the Amundsen-Scott South Pole Station. Dr Martin A. Pomerantz and two French astronomers will use a special solar telescope which was tested at the Pole last season. The purpose of the experiment during the maximum phase of the present 11-year sunspot cycle is to detect large-scale motions on the surface of the sun caused by oscillation in its interior (solar seismology).

Investigations of cosmic ray intensity variations will be continued at the South Pole Station and McMurdo Station. Cosmic ray detectors at these stations and at Thule, Greenland, enable the scientists to monitor the dynamic state of interplanetary weather by keeping track of the changing flow patterns of cosmic rays around the earth.

A team from Stanford University led by Dr Robert A. Helliwell will work at the Soviet station, Vostok, and the Pole Station in an investigation of solar terrestrial effects on atmospheric electric fields in Antarctica. Fair-weather atmospheric electric field data will be used to investigate the effects of solar flares and other solar phenomena upon the atmospheric electric field.

Past solar activity and world climate may be related to anomalous fluctuations in nitrate and ammonia nitrogen in Antarctic snow and ice. If Dr Bruce C. Parker and Dr Edward J. Zeller, and a team from Virginia Polytechnic and State University can establish this relationship, the data will aid investigation of past world climates, and provide a tool for measurement of the age of ice, places and rates of deposition, and

stratigraphic correlations. As part of a continuing project more snow and ice samples will be collected from Byrd, Siple, and Vostok Stations for later analysis.

Geophysical monitoring for climatic change in Antarctic is being continued at the Pole Station this summer and next winter by a team from the National Oceanic and Atmospheric Administration. Levels of carbon dioxide, surface and total ozone, certain fluorocarbons, and aerosols in the atmosphere will be monitored from the South Pole Clean Air Facility. The purpose is to detect long-term changes in concentrations of atmospheric trace gases and particles resulting from human activities that may affect the earth's climate.

A related project will be carried out at McMurdo Station and the Pole Station by scientists from the State University of New York at Albany. The goal is to define the physical properties of atmospheric aerosols, and to determine the meteorological processes that transport aerosol materials from maritime and possibly continental regions to Antarctica.

Measurements of trace gases and aerosols in the Antarctic stratosphere will be made by scientists from the University of Wyoming. They will fly and recover balloons carrying trace gas samplers, aerosol counters, and a condensation nucleus counter from the Pole and McMurdo Stations to measure stratosphere constituents. These constituents are important in determining the stratospheric ozone profile, the level of major volcanic activity, and the way condensation nuclei in the troposphere and stratosphere affect precipitation.

TRITIUM SAMPLING

Because it is so remote the Pole Station is being used by scientists from the University of Miami as a global baseline station for the sampling of tritium gas and tritiated hydrocarbons in the atmosphere. Data will be used in studies of air exchange between the hemispheres, of atmospheric hydrogen and hydrogen residence times, and of the flow of water

vapour between the stratosphere and the troposphere.

Air, sea ice, and sea water samples will be taken north of McMurdo Station by a team from the University of Alaska for comparison with similar samples from the Arctic. Determination of the sources of trace gases — carbon monoxide, carbon dioxide, methane, hydrogen, and nitrous oxide — in the samples will contribute to understanding of atmospheric circulation and the effect of human activity upon the atmosphere. Measurements of carbon dioxide over the sea ice of McMurdo Sound and in the air at the South Pole should provide a clearer understanding of the influence of sea ice upon the atmosphere in the Antarctic.

KATABATIC WINDS

To obtain a better understanding of Antarctica's persistent katabatic winds which blow down to the coast from the Polar Plateau a team led by Dr Gerald Wendler, of the University of Alaska, will establish an array of automatic weather stations from Dome C to Dumont d'Urville Station in Adelie Land which is the windiest part of the continent. Four stations will be established by French scientists, and in co-operation the Americans will also put in four, one for comparison with the present French station, one at Dome C, and two at intermediate points, D59 (68deg 20min S/137deg 21min E) and D49 (67deg 33minS/138 deg 26min E).

Eight automatic weather stations were installed last summer to collect data for meteorological research and operational weather forecasting for aircraft and helicopter flights. This season a Stanford University team will re-calibrate and service the stations at Minna Bluff, Ross Island, Marble Point, White Island, Byrd Station, and the Asgard Range in the dry valleys area. The Byrd Station unit will be moved to Dome C for the katabatic wind studies.

In Southern Victoria Land a project for ecosystem comparisons of dry valley lakes and soils is being continued by a team led by Drs Bruce C. Parker and George M. Simmons, of the Virginia

Polytechnic Institute and State University. Last season scuba divers in the project found vast mats of pinkish-orange coloured algae growing in vast mats about 6m beneath the permanent ice cover of Lakes Fryxell and Hoare in the lower Taylor Valley.

Since early this season the present team has been continuing the studies of the benthic algal mats and their role in the biological activity of Antarctic oasis lakes. Half the team have repeated last season's scuba diving observations, and have made immediate analyses of samples at Lake Hoare, which is at least 30m deep. Lake Fryxell is about 15m deep.

Studies of microbial flora living inside the rocks in the dry valleys and other arid areas, which were initiated by Dr E. Imre Friedmann, of Florida State University, are being extended this season to the Ellsworth Mountains. The existence of cyanobacteria, lichens, and eukaryotic algae has been confirmed in Beacon sandstone, marble, granite, and anorthosite rocks. This season more rocks will be sampled and more organisms cultured. The purpose is to determine the factors that affect the distribution and growth of the microorganisms, and study their possible effects on the rock sub-strata such as weathering and mineral leaching.

KILLER WHALES

In past seasons much of the research in the McMurdo Sound area has been concentrated on studies of seals, penguins, and fish. This season a team from the Hubbs-Sea World Institute will attempt to obtain recordings of the vocal sounds of the local killer whale population. Later, the team headed by Dr Joseph Jehl and Dr William E. Evans will continue its studies of the movement and distribution of killer whales and pilot whales from the United States Coast Guard icebreaker Polar Sea on the way to Palmer Station and Ushuaia, Tierra del Fuego.

A census will be made of the small whales, and they will be photographed for colour pattern studies. Sonobuoys

will be deployed from the icebreaker to record the vocal sounds of the whales. Data will also be collected about other marine mammals and birds to support other projects in the Antarctic Peninsula area.

Weddell seals moving over the ice in McMurdo Sound have been tracked this season by a field team from the University of Minnesota. A radio tracking system with remote sensing has enabled the scientists to obtain data on the movements of the seals, and also Antarctic cod (*Dissostichus mawsoni*) in the waters under the ice. Working at Hutton Cliffs about 16m from McMurdo Station the team has also tested a data collection system which will telemeter data from key monitoring stations to a central laboratory or satellite.

For several seasons Dr Arthur L. DeVries, of the University of Illinois, has worked in McMurdo Sound studying the unique glycoprotein anti-freeze in certain Antarctic fish which enables them to survive whilst swimming in ice-laden sea water. This season he and his team are studying why these fish apparently maintain constant levels of this anti-freeze even in warm temperatures.

FISH PROTEIN

Other studies of the way in which Antarctic fish adapt to sub-zero temperatures have been continued this season by a team led by Dr Audrey V. Haschemeyer, of Hunter College, New York. A major objective is to determine rates of protein turnover in living Antarctic fish for comparison with protein turnover rates in temperate fish and in mammals.

Fish caught from holes drilled in the ice of McMurdo Sound have also been studied by another team led by Dr Joseph T. Eastman, of Ohio University, which has also done scuba diving under the ice in its research. Anatomical studies of the fish are designed to provide a better understanding of their role in the ecosystem of the Southern Ocean.

One United States scientist will work far away from other participants in the research programme. Dr Edward S.

Grew, of the University of California, will return to Enderby Land this month to make a petrologic study of metamorphic rocks. He will be with the Australian National Antarctic Research Expeditions, and will work from a field camp at Mt King. His objective is to estimate the pressure and temperature conditions under which metamorphic rocks in Enderby Land crystallised.

Early next year the United States Coast Guard icebreaker *Polar Sea* will make an oceanographic cruise to the Weddell Sea. One team from the University of California will complete the analysis of temperature and salinity data obtained in the 1978-79 season during the International Weddell Sea Oceanographic Expedition. It will recover current meters set in the southern Weddell Sea and make a closely-spaced array of conductivity-temperature-depth stations.

Because sea ice influences exchanges between the ocean and atmosphere, and is itself modified by these exchanges, a team from the University of States Army Cold Regions Research and Engineering Laboratory is trying to determine the relationship of Antarctic sea ice to the atmospheric and oceanic circulation patterns of the southern polar region. Most of the team's field work will be done with the aid of the *Polar Sea*.

This season the team will place five buoys in the Weddell Sea to gather meteorological data about the relative effects of winds and water currents upon the pack ice. It will also measure ice thickness distribution through satellite imagery and data buoys to determine its effects on heat and other exchanges across the air-sea boundary, and take ice samples to characterise the structural and physical properties of sea ice.

Drift, air temperature, and atmospheric pressure records from buoys deployed last season will be analysed to determine the forcing fields for sea ice motion in the Weddell Sea. These buoys were dropped by parachute from a Hercules aircraft which made a 16-hour flight from McMurdo Station to the Weddell Sea and back.

Byrd's first flight to South Pole commemorated

Two veterans of Rear-Admiral Richard E. Byrd's first expedition, who watched his aircraft Floyd Bennett flying to the South Pole from their field camp at the foot of the Queen Maud Mountains returned to Antarctica last month to celebrate the 50th anniversary of their leader's historic flight. They were Dr Laurence M. Gould, second-in-command of the expedition, and leader of the Geological Party, and Mr Norman Vaughan, who was in charge of the party's five dog teams.

But the planned observance of the anniversary was saddened by the tragic crash of the Air New Zealand DC10 on Mt Erebus on the day that the official party flew south. Events in the programme had to be changed because the resources of McMurdo Station and Scott Base were fully committed to the search for the DC10.

Originally it was planned that Byrd's flight should be commemorated by retracing with a United States Navy Hercules on November 29 the original flight path of the Floyd Bennett from Little America to the Pole. This event had to be cancelled, but on November 30 some members of the party flew to the Amundsen-Scott South Pole Station on a routine supply flight by a Hercules from McMurdo Station.

Dr Gould, now 83, had been to Antarctica six times before, and to the Pole, and decided to remain at McMurdo Station. Norman Vaughan, aged 74, reached the Pole nearly 50 years after he left Antarctica. Also in the party were Byrd's grandson, Mr Richard Breyer, who worked at the Pole Station two seasons ago, and Byrd's nephew, Senator Harry F. Byrd, of Virginia.

When the official party left Christchurch on November 28 for McMurdo Station, the co-pilot of the United States Air Force Starlifter was Norman Vaughan's son, Captain Gerard Vaughan. The party's first priority the day after it arrived was to attend a memorial service to the crash victims in the chapel at McMurdo Station.

In the afternoon a brief ceremony to commemorate the first flight to the Pole was held by the Byrd memorial in front

of the National Science Foundation's chalet. About 200 attended, and the speakers were Dr Norman Hackerman, chairman of the NSF board, Dr Gould, Mr Vaughan, Senator Byrd, Mr Breyer, and Dr E. P. Todd, director of the foundation's Division of Polar Programmes. Dr Hackerman presented an NSF award for distinguished public service in recognition of his lifelong contributions to science, research, exploration, education, and polar policies.

New Zealand commemoration of the flight and Admiral Byrd's long association with New Zealanders and their country was also overshadowed by the disaster in Antarctica. But at Wellington 100 attended a ceremony organised by the Richard E. Byrd Fellowship at the Byrd memorial on the top of Mt Victoria. Speakers included the Governor-General (Sir Keith Holyoake) and the Prime Minister (Mr R. D. Muldoon).

New Zealanders who served in the crews of the two ships of the first expedition were not forgotten. Three of the survivors were located, and each received a letter signed by Dr Gould, which recognised their contribution to Byrd's flight, and a commemorative certificate.

Two of those recognised were 76-year-old Percy James Wallis, of Auckland, who made two voyages south as assistant sailmaker in the City of New York, and Neville Shrimpton, radio operator aboard the Eleanor Bolling. The third veteran, 79-year-old John Morrison, of Dunedin, served in both expeditions, first as fourth engineer on the Eleanor Bolling, and then aboard the Jacob Rupert in 1933-35.

U.S. mercy mission to Molodezhnaya

A critically ill Soviet scientist was flown from Molodezhnaya, the main Soviet station in Antarctica, to McMurdo Station, and on to New Zealand early this month by a Hercules aircraft of the United States Navy's VXE-6 Squadron. After a 23-hour flight the scientist, Vitaliy Kazarin, of Leningrad, who was suffering from cancer, arrived in Christchurch on November 8. He spent two days in hospital, and then was flown home to the Soviet Union.

This was the second time in a year that the United States and the Soviet Union had co-operated in a medical emergency flight from Antarctica. On January 4 a Hercules flew to Molodezhnaya to bring back to New Zealand five men injured in the crash of an Ilyushin 14 transport aircraft at Molodezhnaya on January 2 ("Antarctic", March, 1979, P.315-317).

Because Mr Kazarin's condition deteriorated during the winter the leader at Molodezhnaya asked Captain D. Westbrook, the United States naval support force commander at McMurdo Station, for assistance to bring the Soviet magnetologist to New Zealand. Although the request was received late in October the mercy flight could not be made until the relief of the Amundsen-Scott South Pole Station where the Hercules had to land to refuel on the return flight from Molodezhnaya. VXE-6 Squadron also flew extra fuel to the Pole Station for the mercy flight.

With a crew of nine and medical assistants on board the Hercules made a direct flight of 3829km to Molodezhnaya in 7½ hours. The aircraft was piloted by Commander D. Srite, commanding officer of VXE-6 Squadron, assisted by Lieutenant-Commander J. Paulus. Also aboard were a flight surgeon, Lieutenant-Commander Caroline Deegan, a medical orderly, M. Lott, and an interpreter and weather observer, Dr E. Lysakov, a Soviet exchange scientist, who spent last winter at McMurdo Station as a meteorologist.

This was the second time Dr Lysakov had acted as interpreter and weather

observer on a mercy flight. He performed the same duties on the flight to Molodezhnaya earlier this year. Lieutenant-Commander Deegan also flew to Molodezhnaya and back to McMurdo Station on the same flight.

Because of the critical fuel position, the Hercules spent only 20 minutes on the runway at Molodezhnaya. One of four doctors at the Soviet station, Dr A. Yemelyanov, accompanied Mr Kazarin on the return flight. The Hercules was refuelled at the Pole Station, and then flew on to McMurdo Station for more fuel and a crew change.

For the seven-hour flight to Christchurch Lieutenant-Commander J. Goodrum and J. Lancaster (medical orderly) replaced Lieutenant-Commander Deegan and Lott. The aircraft was flown on the final leg by Lieutenant-Commander R. Brandt and Lieutenant R. Bentley. Lieutenant-Commander Brandt was one of the pilots on the first leg of the earlier mission to Molodezhnaya.

Dr Lysakov remained aboard the aircraft. Later he flew back to the Soviet Union from Christchurch with Dr Yemelyanov and Mr Kazarin.



BAS NEWS

Faraday to be rebuilt this season

Glaciological studies across the southern part of the Antarctic Peninsula will be made by four independent British Antarctic Survey teams this summer. Other projects in the research programme will include aeromagnetic flights over selected areas of the Antarctic Peninsula and the Weddell Sea, experiments on the feeding of krill in the waters around South Georgia, and geological investigations of the plutonic rocks of the Antarctic Peninsula.

Modernisation of Faraday geophysical observatory will be the major logistic task this season. The station was established on Winter Island in the Argentine Islands in 1947 and the present buildings on the adjoining Galindez Island date from 1954. Major alterations will be made to the existing main building and all domestic and laboratory facilities improved. A new two-storey extension will provide accommodation for 24 men.

BAS began its summer programme on October 16 when the Royal Research Ship Bransfield sailed from Southampton, under the command of Captain S. J. Lawrence. After visiting Mayport, Florida to take on supplies for the United States Palmer Station, she proceeded south by way of Rio de Janeiro and was due at South Georgia at the beginning of this month.

She was to call at the Falkland Islands to pick up more passengers (48 joined the ship in Southampton) including summer field parties to be landed at Hope Bay and at the Damoy air facility. Those taken to Damoy will be flown south to summer work sites. (The two Twin Otter aircraft left Toronto in mid-November).

Palmer Station will be relieved about the same time, as will Faraday if sea ice conditions permit. The Bransfield will then relieve Signy and revisit South Georgia before sailing south to Halley.

Among the men on board is the artist David Smith who is making his second

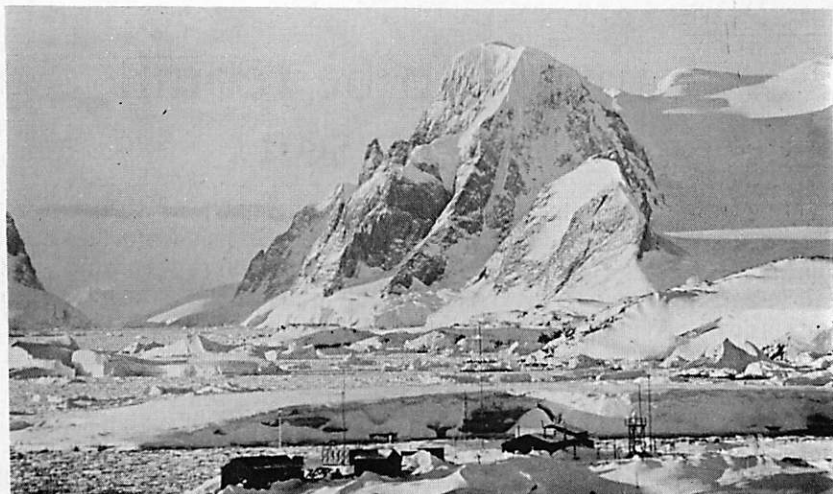
summer visit. Paintings done on his previous visit now adorn both the B.A.S. headquarters and the Scott Polar Research Institute in Cambridge. Also on board is a team of builders who will work on the modernisation of Faraday.

Among the scientists going south this summer from headquarters is a geologist who will work on the plutonic rocks of the Antarctic Peninsula and collect samples for geochemical analysis. A second geologist will investigate the fossiliferous sedimentary rocks associated with the ancient volcanoes. This project is expected to give a more complete picture of the ancient arc which is thought to have formed where part of the Pacific Ocean floor was sliding beneath the Antarctic Shield.

A third geologist, Dr. M. R. A. Thomson, has joined the large American earth science team working in the Ellsworth Mountains. Together with Dr I. W. D. Dalziel of Lamont-Doherty Geological Observatory, New York, he will assess whether the area is a suitable one for studying the general relationships and differential movement between the Antarctic Peninsula and the Antarctic Shield.

ICE DRILLING

Aeromagnetic flights will be continued by a team of two geophysicists and an electronics engineer, who will install the magnetometer and fly over selected areas of the Antarctic Peninsula and Weddell Sea. Their programme will



Faraday, the British Antarctic Survey geophysical observatory on Galindez Island in the Argentine Islands, which is being modernised this summer. Major alterations will be made to the present buildings which date from 1954. The picture was taken with a telephoto lens.

BAS photo by Alan Rodger

include flights from British, Argentine and Soviet stations.

Six glaciologists are also going south for the summer. With the support of the field assistants they will operate as four independent teams across the southern part of the Antarctic Peninsula.

One team will study the effect of ocean tides on the Ronne Ice Shelf, particularly at the "hinge-zone". Two others will use a newly-developed hot water drill to probe the 300m thick George VI Ice Shelf, and deploy strings of oceanographic sensors in the seawater below.

POLLUTION STUDY

A fourth glaciologist will examine the electrical properties of the surface ice, which are related to mechanical properties and the presence of impurities, and therefore relevant to general problems of the stability of ice shelves. Two chemical glaciologists will sample snow from pits, bore-holes and crevasse walls as part of a continuing study of global atmospheric pollution.

Work on the second season of the long-term Offshore Biological Programme will be limited to two months

because the Royal Research Ship John Biscoe, which completed sea trials at the end of last month, is due to sail south at the end of this month. This is later than had been expected.

This season's work will be concentrated on an area of undisturbed water between the South Orkney Islands and South Georgia, where the physical and chemical parameters of the water will be related to the distribution of plankton. Around South Georgia the vertical and horizontal distribution of the plankton will be monitored in detail.

KRILL EXPERIMENTS

Three biologists will work from Grytviken, South Georgia. One will carry out experiments on the feeding of krill, controlling their diets and measuring the rates at which they remove nutrients from the water. Another — a professional diver — will supervise under-water biological work, and a third — a terrestrial biologist — will work on special study sites near Grytviken.

Two biologists will work on Signy Island on Antarctic shags and on insects and mites in the moss. A visiting biologist from Bristol University will

make observations of sea birds from the Bransfield.

Atmospheric sciences and observatory geophysics programmes continue at Faraday (Argentine Islands), Halley and South Georgia. Faraday has been operating the first British microprocessor to be used in Antarctica. This instrument, the Ionospheric Data Entry System, greatly simplifies the reduction and handling of ionospheric data, making the data computer-compatible at an early stage as well as controlling many of the possible human errors.

WEATHER DATA

Amongst the equipment being taken south this season is a semi-automatic weather station which has been developed recently. This will be installed at Grytviken. After thorough field testing similar equipment will be developed for the other BAS stations. The new station is designed to provide most of the routine meteorological data, thus freeing the scientific staff to concentrate on research.

On South Georgia, local journeys were resumed in August; the old whaling beacons were repaired in preparation for the next phase of the Offshore Biological Programme. A pleasant surprise at the beginning of the month was the arrival of a Polish trawler with two bags of mail for the BAS men.

The old whaling stations in Cumberland Bay and Stromness Bay, and local glaciers, were visited in September. At the same time biologists resumed diving operations and also carried out field work at Dartmouth Point, Cumberland Bay and at St. Andrew's Bay to the south-east.

RETURN OF SKUAS

The return of the elephant seals and skuas in September signalled the end of winter. A one-winged skua which had remained at the station throughout the winter declined to join the new arrivals and now seems to be a permanent resident.

In October, a new field hut was prefabricated at the base for erection at Royal Bay, beyond St. Andrew's Bay.

Re-consolidation of the sea ice and the return of longer days at Signy Island enabled a number of visits to be made to nearby Coronation Island in the first half of September. Strong winds then broke up the ice, and the accompanying high temperatures caused melt-water problems around the station. All hands turned to the urgent task of digging drainage pits and channels, the former providing a surfeit of fresh water for showers and baths.

RAINY DAYS

At the Argentine Islands, several climbing parties from Faraday took advantage of solid sea ice and longer days to visit the mainland in September and October. One party which climbed Mt. Shackleton in September had to sit out two days of rain before being able to return to base!

VISITS TO BASES

Further south on Adelaide Island, the Rothera Station men, with vehicles and the residual dog teams, were out in force from August onwards. In August, one party managed to reach the old British base on Dettelle Island in Lallemand Fjord but were stranded there for two weeks when the ice temporarily departed. Two other parties visited the old base on Horseshoe Island, replenishing depots en route.

In September, a party visited the Argentine base San Martin on the Debenham Islands, 128 km away, and an Argentine party paid a return visit shortly afterwards. Other groups travelled to Blaiklock Island, where the refuge hut was repaired, and to the eastern side of the Antarctic Peninsula overlooking the Weddell Sea.

PENGUIN COLONIES

Several localities on Adelaide Island and around Square Bay in north-eastern Marguerite Bay were visited in October, and another party from San Martin

visited Rothera. During October, the piedmont air facility was prepared for the summer air operations: 700 drums of aviation fuel were hauled up from Rothera three miles away.

At Halley, the men ventured out in September on the annual trip to the Emperor penguin colonies about 6.4 km from base. After circumnavigating an area of pressure ice they were rewarded

by the sight of several thousand Emperors and chicks.

Work at the base included the digging out of the garage ramp to get the vehicles to the surface, the jacking up of the mobile ionospherics hut and the removal of accumulated ice from around the buildings in the steel-lined tunnels. In October a field party left a vehicle caboose at the "hinge-zone" as a refuge for summer travellers.

Second French yacht sails to Antarctica

Last month a second French yacht sailed from New Zealand to Antarctica. Charles Ferchaud and his sister, Jean-Marie, left Auckland for Palmer Station, the United States base on Anvers Island, on November 29 in the 12m steel ketch Momo. They expected to reach Palmer Station in six or seven weeks.

First to sail from New Zealand were three French mountaineers, Jean Lescuré, his wife Claudine, and her brother, Jean-Marie Pare. They left Lyttelton in the 10m aluminium yacht Isatis on December 3 last year and reached Palmer Station on January 15. Later they called at Port Lockroy, Wiencke Island, and then sailed to the South Shetlands and on the Chile.

Like the crew of the Isatis the Ferchauds have had sailing experience in the Arctic. Charles Ferchaud, who is 30, was a chief engineer in French merchant ships for 10 years. His sister, who is 31, worked in several African countries as an accountant for a French company. They began their sailing in the Bay of Biscay when they were very young.

In May last year the Ferchauds sailed from France to Tromsø, Norway. Then they took their 15-tonne ketch to Spitsbergen. With good ice and weather conditions they were able to reach 80deg 30min N, the limit of the ice. On the return voyage to France they called at Reykjavik and Plymouth.

Last November the Ferchauds sailed to the Azores and the Canary Islands,

and then crossed the South Atlantic to Brazil, arriving at Salvador de Bahia at the beginning of April. From Rio de Janeiro they sailed to Cape Town, and in May decided to go to Antarctica.

For the present voyage the Momo has been re-rigged, and her sails have been strengthened. She has a paraffin heater, and can be steered from inside under a plexiglass dome.

At the end of July the Ferchauds left Cape Town, and after six weeks in the "Roaring Forties" reached Fremantle. Then they sailed to Sydney by way of Bass Strait, and discussed their plans with Dr Davis Lewis, who sailed his 9.7m steel sloop Ice Bird from Sydney to Palmer Station in 1972-73.

Depending on ice conditions, the Ferchauds plan to remain in the Antarctic Peninsula region until the end of February, calling at two British Antarctic Survey bases, Faraday in the Argentine Islands, and Rothera on Adelaide Island. At the beginning of March they will sail for Cape Town by way of the South Shetlands, South Orkneys, and South Georgia.

Two West German expeditions sail south

West Germany's two Antarctic expeditions, the first for 40 years, both sailed south this month. One will spend more than two months in Northern Victoria Land making geological studies with New Zealand chartered helicopter support; the other will survey the site for West Germany's first permanent base on the Ronne Ice Shelf on the Weddell Sea side of the continent.

GANOVEX 79, the expedition to Northern Victoria Land, sailed from the New Zealand port of Timaru on December 6 aboard the 1598-tonne Schepelsturm, a Hansa Line vessel designed for polar work and strengthened for ice-breaking. The expedition is led by Dr Franz Tessensohn, a geologist in the newly-established Antarctic Division of the Federal Institute of Geosciences and Resources in Hanover.

There are 12 West Germans, six New Zealanders, an American, and an Australian in the expedition. Twelve of the group are technicians, and eight are scientists. One of the geologists is Dr D. N. B. Skinner, of the New Zealand Geological Survey, who has spent six seasons in Antarctica since 1960. He acted as interpreter and liaison officer during the expedition's survival training at Mt Cook, which was organised by Mr Gary Ball, who will be the West Germans' field guide in North Victoria Land.

Designed and built four years ago, the Schepelsturm is under charter to the Deutsche Offshore Gesellschaft. She has two main engines each developing 4500 h.p., and her reinforced hull and 100 h.p. bow-thruster enable her to cut through pack ice 3.6m thick at a speed of six knots. On a test run in the Spitzbergen region she cut through a metre of solid Arctic ice at eight knots.

With a crew of 15 the Schepelsturm is well-equipped to act as the expedition's floating base in Antarctic waters until February next year. Her supplies include

a potted Christmas tree placed on board before she left Timaru, 1000 tonnes of fuel, 180 tonnes of fresh water (she also has a vaporising plant to produce distilled water), and 150 tonnes of aviation fuel for the three helicopters.

Captain Udo Rieck, who commands the Schepelsturm, has had experience of ice and icebergs in the Baltic and in Arctic waters. He has served aboard an icebreaker in the Baltic, and also in the Schnoorturm, sister ship to the Schepelsturm, which was used to tow icebergs out of the sea lanes off Labrador, and away from offshore oil rigs.

After her return from Antarctica late in February the Schepelsturm will go to Australia where she will be used for offshore oil exploration. In the 1980-81 season she will sail into the Weddell Sea to take part in the establishment of the West German base on the Ronne Ice Shelf. She will return to Antarctica in the 1981-82 season when the West German programme is planned to tie in with the international expedition to Northern Victoria Land.

Deutsche Offshore Gesellschaft has also been responsible for the logistics of the expedition which will survey the site for the permanent station on the Ronne Ice Shelf. The chartered Norwegian polar research vessel Polarsirkel sailed from Ushuaia, Tierra del Fuego, about the middle of this month. She carried two helicopters for ferrying supplies and equipment and ice reconnaissance.

During January and February the Polarsirkel will work her way westward towards the Antarctic Peninsula as far as possible to enable the scientists and engineers to study alternative sites on the ice shelf. Some of the 20 scientists and technicians aboard the vessel will do marine biological and oceanographic research during her cruise in the Weddell Sea.

Setback to Soviet plan for Druzhnaya

Soviet plans for the relief of Druzhnaya, the summer research station on the Filchner Ice Shelf, and this season's geological and seismic programme, suffered a severe setback when the ice-strengthened cargo ship Olenik collided with another Soviet ship in a narrow and stormy stretch of sea off Denmark on October 31. The 7684-tonne Olenik was cut almost in half by the collision with the 15,090-tonne tanker General Shkodunovich. She burst into flames and burned fiercely for several hours.

One member of the crew of the Olenik died, two were severely burned, and four others suffered minor burns. Crew members, and scientists of the 25th Soviet Antarctic Expedition, including several women, jumped from the blazing ship after the collision. Ninety-four crew and expedition members were rescued, but four men were reported missing.

Carrying four helicopters, a light aircraft, fuel, and oxygen supplies, the 13-year-old Olenik sailed from Leningrad on October 28, and was expected to reach Druzhnaya early this month. As she is reported to have burned fiercely for several hours after the collision, it is assumed that the four

helicopters, the aircraft, and all her cargo were destroyed or badly damaged.

Several ships, including the Swedish ferry Stena Olympic, aided the rescue operation. Danish Navy helicopters plucked men and women from the icy sea in stormy and foggy weather. West German coastguards also helped to rescue members of the crew and the expedition.

The four badly burned men were taken to hospital in Copenhagen.

Although damaged in the collision, the General Shkodunovich, which carried a cargo of molasses, was able to sail on to the Danish port of Abenra. All her crew were reported safe and unhurt.

Damaged Starlifter's landing

A United States Air Force Starlifter damaged in an emergency landing at Christchurch on October 31 was flown back to the United States late last month after temporary repairs. The Starlifter, engaged in the summer airlift of men and supplies for the United States Antarctic research programme, flew 3895km from Williams Field, McMurdo Station, to New Zealand with its starboard main landing gear trailing about one metre below its normal position.

Captain Robert E. Colley, pilot of the Starlifter, learned that the landing gear had been almost torn away soon after he took off from Williams Field on the night of October 30. Because of lack of maintenance facilities he decided to carry on to New Zealand.

Although the landing gear was hanging only by the hydraulic lines, Captain Colley managed to land the Starlifter safely at 2.08 a.m. after a flight of nearly seven hours. The outer starboard engine and the wing tip were damaged when the Starlifter struck the main runway, but the crew of nine and 11 passengers scrambled to safety in less than a minute, and no-one was injured.

A new engine, wing tip, and landing gear, were flown from the United States last month, and temporary repairs were made to the Starlifter with the assistance of Air New Zealand engineering staff at the airport. The Starlifter left Christchurch for the United States on November 26.

A summer with Poles and Antarctic krill

by Roger Waite

In the 1978-79 summer an English-born New Zealand marine biologist, Roger Waite, was in the Antarctic but a long way from other New Zealanders working in the Ross Dependency. He was at Arc-towski Station on King George Island, South Shetlands, which was established in the 1976-77 season as Poland's first permanent Antarctic research station.

Mr Waite, who has a B.Sc degree with honours from the University of Keele, North Staffordshire, worked at Arc-towski Station on the ecology of the Antarctic krill *Euphausia superba*. In the following article he gives his impressions of life with the Poles on King George Island.

As a result of a proposal by Professor R. H. Clark, universities representative on the Ross Dependency Research Committee, and a spell of frenzied diplomatic activity by the New Zealand Ministry of Foreign Affairs, I was granted a position on the 1978-79 Polish Antarctic Expedition. I joined the motor-vessel Antoni Garnuszewski in Kiel, West Germany, and was treated to a sedate cruise to Arc-towski Station by way of Argentina.

The station is located on Admiralty Bay, King George Island, in the South Shetlands. Here I was to spend the summer working on the ecology of the Antarctic krill *Euphausia superba*, and other locally occurring euphausiids.

First impressions of the station were vivid. Rows of bright orange huts set against an impressive background of precipitous ice-covered mountains; volleys of Very lights tracing across the sky as the winter group celebrated the arrival of their fresh company; passionate reunion of old friends and the welcome of new; the stark beauty of the ice and a vast array of wildlife with little fear of man.

Two weeks of hard work followed — discharge, transport, and stowage of stores, ditch digging, and constructing helicopter pads. Then the marine laboratory, aquaria, and boat were prepared

for the season's labour. The projects then began.

The work of the marine laboratory was principally on the Antarctic krill because of its tremendous importance to Antarctic marine ecosystems, and the prospect of a colossal fishery steadily approaching a reality. Krill-orientated projects included work on muscle physiology, natural decomposition, moulting, and population structure.

Wind, waves, and ice permitting, krill were caught from *Dzunia*, an open fishing boat reinforced below the water-line against ice. A 2m by 1m rectangular mid-water trawl with 6mm mesh was used, this being the largest net the *Dzunia* could pull.

Krill fishing took place throughout the day in winds of up to about Force 5 on the Beaufort scale. Handling wet nets in such winds as these, and sub-zero temperatures is a hazard familiar to most Antarctic marine biologists. By the time a night's fishing was over fingers were frozen and the mind was numbed. But the work had only just begun.

Other marine projects included a survey of benthic macro-algae, invertebrates, and fish species within Admiralty Bay, a study of fish muscle history, and various aspects of the bay's hydrology.



Duznia, an open fishing boat used by Polish scientists to catch krill from Arctowski Station. The photograph was taken by Roger Waite, a New Zealand marine biologist, who spent the 1978-79 summer at the station on King George Island.

The work of other disciplines of Arctowski Station has been briefly reviewed in the June, 1979, issue of "Antarctic", and will not be repeated here.

STATION LIFE

Work continued seven days a week with a slackening of pace on Sunday, many Poles being devout Catholics. Occasionally, however, nature decreed a public holiday for all except the meteorologists and cooks who had to work overtime. At times such as these extended tea breaks with attendant amiable hubbub were the principal occupation.

While conversation was initially difficult for a unilingual New Zealander, a system of key words from four or five cultures (accompanied by gesture and mime) gradually evolved to a point where I could be 95 per cent certain I had correctly guessed the subject of conversation. Even when this failed normally there were competent translators available. Poles are an extremely sociable race, always willing to give assistance. I think it is a great credit to their hospitality that the only occasion on which I would have liked to have

been at home for even a minute was Christmas morning.

Entertainment on the station was principally do-it-yourself as with most Antarctic bases. The only recreation officially provided was table tennis outside the radio shack, and two films a week in the dining room. A prohibition on alcohol was lifted on occasions of religious importance or of local significance such as the chief's birthday.

This gave ample opportunity to sample the many varieties of excellent vodka produced in Poland. Interesting locally-manufactured varieties of contraband liquor also appeared on days of personal import, but generally tea or coffee provided ample stimulation for amiable conversation. This was fortunate. My trusted translators' lingual abilities were inversely proportional to their alcohol consumption.

PENGUIN COLONIES

Outside the station there was much to see and do, although the area normally available to walkers was limited by the presence of glaciers. Walking along the beach bordering the penguin colonies was the most popular pursuit, although

agate collecting came a close second. Serious photography was limited to the dedicated, affluent or those in possession of departmental equipment.

It was always rewarding to walk with individuals from different scientific disciplines as it always produced new information on life, rock, sea, and air. This produced eventually an interesting composite view of the area's past and present environment. But for me the major point of interest was the wildlife.

Admiralty Bay supports large numbers of birds and mammals ultimately dependent on fish, krill, and other invertebrates in the sea. Also there is the inevitable population of skuas largely dependent on station refuse for food.

Some 8000 Adelie penguins crowd the hills to seaward of the station, providing a dramatic interaction of sights, sounds, and, when the wind is in the wrong direction, smell. There are also hundreds of Gentoo and Chinstrap penguins roosting locally. Three Royal penguins also visited the bay briefly.

The opportunity to observe the behaviour of birds so closely was unique in my experience. The penguins would allow you to approach to about 3m before they showed signs of significant disturbance. This permitted close observation of the breeding birds. It was very peaceful, if that is an apt word for a penguin colony, just to sit with binoculars during an hour of leisure, allowing yourself to become enraptured by the bustle of life. Or, on occasion, death at the hands of the ever-present skuas.

A few pairs of sheathbills also roamed the colonies in search of some tasty morsel. Moderate numbers of Dominican gulls were also present. Elsewhere in the bay giant petrels, albatrosses, Cape pigeons, snow petrels, Wilson's storm petrels, and Antarctic terns evaded, hid from, ignored or dived at you.

Groups of elephant seals clustered on the beaches, sleeping off their last meal, engaging in mock combat, and bellowing in noisy protest against the intrusion

of man. Further out towards the sea large colonies of fur seals congregated in the bay. Weddell, Crabeater and Leopard seals were present on the shore or icebergs.

I saw only about nine whales during my stay at the station. Four were humpbacks, and the rest were too distant to identify. But the number of whalebones scattered on the beaches testified to their previous abundance. And rusty harpoons provided evidence of the cause of their demise.

FIVE STATIONS

Man was the only other locally abundant mammal. Five other stations have been built on King George Island, three of which are abandoned at present. The two operational stations are Soviet (Bellingshausen) and Chilean (President Frei) Stations built side by side in the spirit of brotherhood engendered by the Allende Government. The friendship has nearly gone but the stations remain.

On New Year's Day about 20 people from Arctowski visited the Russians by helicopter. I was kindly invited to go with them to enjoy Russian cooking and hospitality which was so good that the helicopter pilots treated us to a display of their considerable flying skills on the return journey, nearly inducing nausea in several passengers. The second helicopter became non-functional shortly afterwards, preventing further social visits.

However, I was allowed to hitch a ride to the abandoned British station "G" in Admiralty Bay. The derelict structure was partly restored by field parties from Arctowski over the summer for use as a field camp, but the empty shell still reminds one of the transience of man's present inhabitation of Antarctica.

Other events on the social merry-go-round of the Antarctic Peninsula included visits of various ships to the base, the most interesting of which was the Professor Siedlecki. Unfortunately, from a professional viewpoint, it was equipped for fish rather than krill research. Two tourist ships sporadically deposited their human cargo at the sta-

tion for a mere \$5000 for each passenger.

Except for visits from the naval vessels of the Argentinian, British, and Chilean claimants to the area, the United States National Science Foundation's ship *Hero* was the only other visitor. Its regular calls gave me practice in the English language. And Graeme Currie, *Hero's* Australian radio operator, made home seem somehow nearer.

But the return of the Antoni Garnuszewski brought it closer still. After a one-month tour of the pack ice

she picked up the expedition from the Polish Dobrowolski Station at the Soviet station, Mirny, and then called at Adelaide, South Australia, for fuel and cargo. Here I said farewell to my good friends as they sailed for Poland, and returned to those essences of civilisation — petrol and fluent conversation.

[Mr Waite is now in Christchurch, and is working in the zoology department, University of Canterbury. His present research is concerned with krill population dynamics.]

THE READER WRITES

SCOTT'S PARTY

Sir,—The Antarctic appears to attract more than its fair share of "authorities". On the strength of visits lasting several days or even hours many travellers return as experts and are prepared to pontificate on all things polar.

A report from Johannesburg by the correspondent of "The Times" dated November 15 quoted Peter Johnson as stating that scientists claimed that the bodies of Scott's polar party would emerge from the ice shelf "any day now". The report then claims that Johnson visited the site in company with Sir Peter Scott recently.

This report received wide publicity, Johnson being referred to as an experienced Antarctic traveller etc. Most New Zealand radio stations and newspapers carried the story, but several were moved to add additional bits of mis-information. Quoting "The Times", the "Christchurch Star" of November 21 added that Johnson had visited New Zealand's Scott Base at the time.

Surely it is not unreasonable to expect a newspaper of the reputation enjoyed by "The Times" to check such reports. Peter Johnson is a South African photographer and author who, as a passenger on the Lindblad Explorer, made his first visit to the Ross Seas area in February this year. He could not be regarded as an experienced Antarctic traveller, and I doubt that he made such a claim.

I took Johnson and 96 other visitors

from the Lindblad Explorer through Scott's hut at Cape Evans. The visitors stayed less than three hours in the area. During this time Franz Lazi's television team interviewed Sir Peter Scott in his father's cubicle for West German viewing.

Apart from a previous brief landing at Cape Royds this was the only contact the ship had with Ross Island. There was no visit to Scott Base, and no visit to the site where it is believed the bodies lie.

I know of no scientist who would stake his reputation on being able to pinpoint the present position of Scott's party, and certainly of none who would speak of emerging from the ice "any day now". The unpredictable movement of ice generally, plus the unknown influence of Ross Island on that movement, would not allow anything other than an educated guess, and give no credence to any suggestions to the contrary.

Yours etc.,

BADEN NORRIS

Christmas gifts

New Zealand men and women at Scott Base, and with scientific parties in the field, will share gifts of Christmas cakes, mince pies, fruit, and home-made biscuits from the Canterbury branch of the New Zealand Antarctic Society again this year. For the last 16 years branch members have sent cakes and biscuits to New Zealanders working in the Antarctic.

Desert sands to southern ice

After crossing the Sahara Desert from Algiers in four-wheeled drive vehicles five members of the British Transglobe Expedition arrived in the Ivory Coast port of Abidjan early last month. There they joined the Benjamin Bowring, formerly the Kista Dan, for the next stage of their planned polar circumnavigation of the world using the Greenwich meridian as a basic route.

This month the expedition, which is led by Sir Ranulph Fiennes, will sail to Cape Town to prepare for the Antarctic stage of its journey. The Benjamin Bowring is expected to reach the South African base, Sanae, in Queen Maud Land, early next year.

A base will be established near Sanae, and four members of the expedition will later travel to a base in the Borga Massif where they will winter in 1980. Early in October the ice group hopes to begin the first stage of its 4224km Antarctic

crossing to Scott Base by way of the South Pole, the Robert Scott Glacier, and the Ross Ice Shelf.

Members of the expedition, under the leadership of Ranulph Fiennes are: Ice team, Charles Burton, Oliver Shepard. Mobile ice base, Virginia Fiennes, Simon Grimes. Antarctic base, David Mason, Anthony Birkbeck. Air supply team, Captain Giles Kershaw, Sergeant Gerry Nicholson, Royal Electrical and Mechanical Engineers.

Rear-Admiral O. St John Steiner, a former Assistant Chief of Defence Staff, now retired, is in command of the crew of the Benjamin Bowring. Other members are: Antony Bowring, Lieutenant Peter Polley (Canada), Cyrus Balaporia (India), David Peck, Kenneth Cameron, Mark Williams (New Zealand), Howard Wilson (New Zealand), Terry Kenchington, Eddie Pike, Martin Weymouth, Paul Clark (United States), Jill Macnicol.

“Pete” Demas went south twice

One of the 11 surviving members of the winter party of Byrd's first expedition, E. J. Demas, died in California on November 16. “Pete,” as he was known to all the men who served with Byrd in 1928-30 and 1933-35, was also the last survivor of Byrd's North Pole expedition.

Demas accompanied Byrd on both of his Arctic expeditions before he went south. In the 1928-30 expedition he served as an aviation mechanic, and played a leading part in the overhaul, maintenance, and preparation of the expedition's aircraft, including the Floyd Bennett.

For his second expedition Byrd took four snowmobiles for use on scientific journeys, and the establishment of supply depots. Demas was in charge of the tracked vehicles, and his mechanical skills in their maintenance, overhaul, and operation in polar conditions contributed greatly to the scientific achievements of the expedition.

In the winter of 1934 Demas devoted all his skills and energy to enable the men at Little America to rescue Byrd from a certain death when he became ill during nearly four months alone on the Ross Ice Shelf at Advance Base 198km to the south. He and others kept the tractors running, and he was one of the men in the party led by Dr Thomas C. Poulter which reached Advance Base early in August after three earlier attempts had failed because of mechanical difficulties, blizzards, and extremely low temperatures.

One of the New Zealand Antarctic Society's caretakers who worked on the historic huts on Ross Island in the 1976-77 season has returned to Antarctica. Jeremy Sutton-Pratt, a member of the Wellington branch, is now at Rothera, the British Antarctic Survey base on Adelaide Island in the Antarctic Peninsula area.

Award of Conservation Trophy

A world authority on the ecology of penguins, Dr Bernard Stonehouse, has been awarded the New Zealand Antarctic Society's Conservation Trophy for 1979. The award has been made to Dr Stonehouse, of the School of Environmental Science, University of Bradford, in recognition of his efforts to protect and preserve the most southerly penguin colony in the world at Cape Royds. The award, announced jointly by Mr R. M. Heke, president of the Antarctic Society, and Mr R. L. Park, chairman of the Canterbury branch, also recognises his contribution to New Zealand Antarctic research as leader of the University of Canterbury biological unit on Ross Island for five years.

There have been seven previous awards of the trophy — an Emperor penguin carved in African walnut — which was presented to the Canterbury branch by one of its members in 1971. The trophy is awarded to any person or organisation contributing significantly to any aspect of Antarctic conservation — preservation of flora and fauna in the Antarctic or on sub-Antarctic islands, and the preservation of historic buildings. Dr Stonehouse was nominated by the Canterbury branch of the society which selects the recipient.

A 53-year-old Englishman, Dr Stonehouse began his distinguished career in Antarctic research 33 years ago. After war service in the Fleet Air Arm, he worked from 1946 to 1950 with the Falkland Islands Dependencies Survey (now British Antarctic Survey) as a meteorologist, biologist, and pilot. He spent three years at the FIDS base in Marguerite Bay, discovered an Emperor penguin colony, and made the first breeding studies of the birds since the days of Dr Edward Wilson.

From 1953 to 1956 Dr Stonehouse was biologist to the Falkland Islands Government on South Georgia where he worked on the ecology of the King penguin. In 1957-59 he was the leader of the British Ornithological Union's centenary expedition to Ascension Island in the South Atlantic. He then came to New Zealand in 1960 as a senior lecturer in the University of Canterbury zoology department.

In 1961 Dr Stonehouse initiated the zoology department's biological research in Antarctica. He led the first expedition to Cape Royds on Ross Island, and directed for five summers studies of Adelie penguins, Weddell seals, McCormick skuas, marine fish and invertebrates, and fresh-water fauna in the McMurdo Sound area.

His studies of the small Adelie penguin colony of breeding birds at Cape Royds revealed that its numbers had declined alarmingly since the increase in activity on Ross Island. Because of flights by United States Navy helicopters in the area, and pressure from visitors the colony declined from 2000 pairs in 1955 to 1100 in 1962.

Dr Stonehouse reported this steady decline in numbers to the Ross Dependency Research Committee. His recommendations were accepted by the committee and the United States authorities, and the decline was arrested. New flying regulations kept helicopters away from the breeding areas, and pressure from visitors was reduced.

Until he returned to England in 1969 Dr Stonehouse also worked on the ecology of sub-Antarctic and temperate latitude penguins with the University of Canterbury biology unit, and as a New Zealand resident. He has written extensively on the birds and animals of Antarctica, and in 1975 edited an authoritative book on the Spheniscidae, "The Biology of Penguins".

ANTARCTIC

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Yearly subscription NZ\$6.00, Overseas NZ\$7.00, includes postage (air mail postage extra), single copies \$2.00. Details of back issues available, may be obtained from the Secretary, New Zealand Antarctic Society (Inc.), P.O. Box 1223, Christchurch, New Zealand. Back issues more than five years old are available on request.

Overseas subscribers are asked to ensure that their remittances are converted to New Zealand currency.

NEW ZEALAND ANTARCTIC SOCIETY (INC.)

The New Zealand Antarctic Society was formed in 1933. It comprises New Zealanders and overseas friends, many of whom have seen Antarctica for themselves, and all of whom are vitally interested in some phase of Antarctic exploration, development, or research.

The society has taken an active part in restoring and maintaining the historic huts in the Ross Dependency and has been involved in the establishment of a national Antarctic centre at the Canterbury Museum, Christchurch.

There are two branches of the society and functions are arranged throughout the year.

You are invited to become a member, South Island residents should write to the Canterbury secretary, North Islanders should write to the Wellington secretary, and overseas residents to the secretary of the New Zealand Society. For addresses, see below. The yearly membership fee is NZ\$4.00 (or equivalent local currency). Membership fee, overseas and local, including "Antarctic", NZ\$10.00.

New Zealand Secretary

P.O. Box 1223, Christchurch

Branch Secretaries

Canterbury: P.O. Box 404, Christchurch.

Wellington: P.O. Box 2110, Wellington.

