

ANTARCTIC

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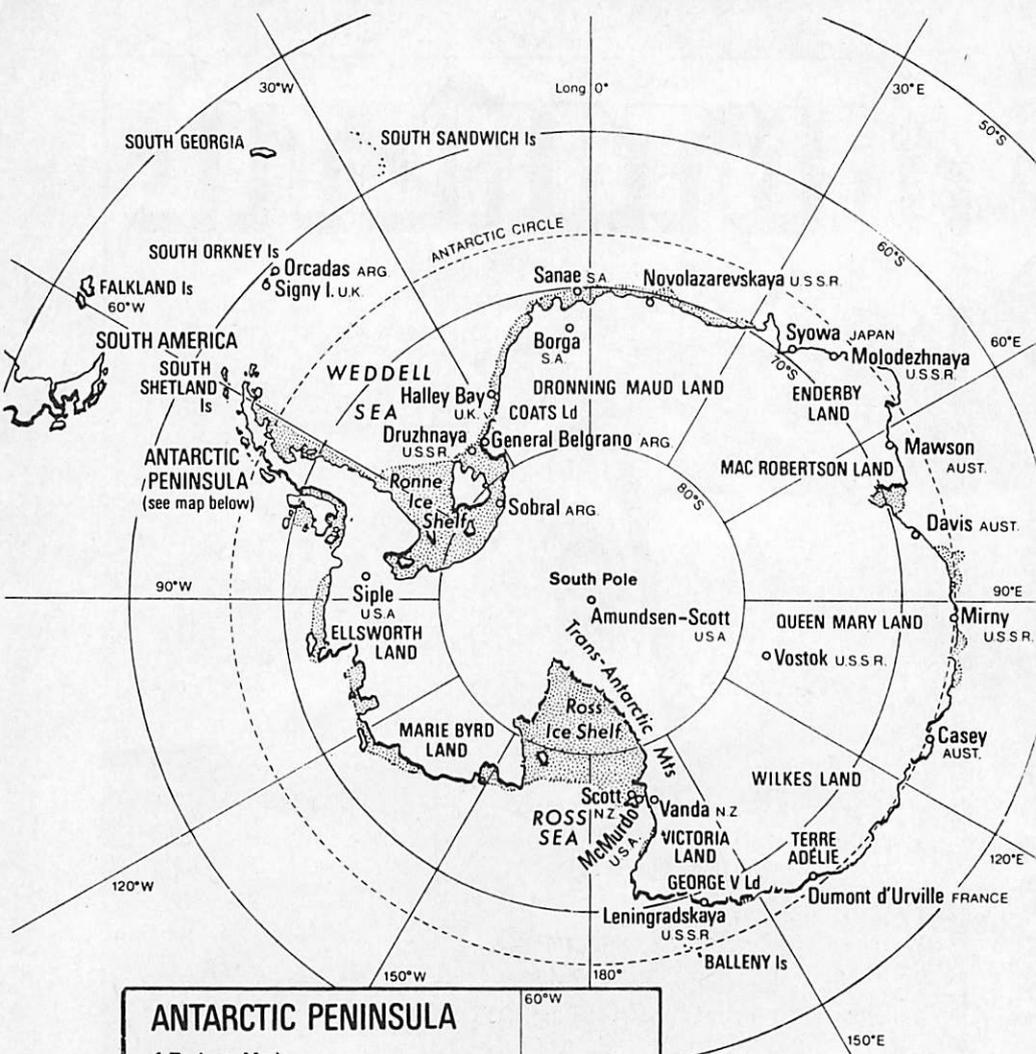
Drillers on the Ross Ice Shelf last season used a new hot water system to penetrate 416m of ice and gain access to the waters of the Ross Sea. Here the rig is at work on an access hole for a Norwegian science project.

U.S. Navy photo

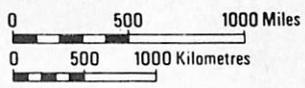
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ANTARCTICA



ABBREVIATIONS

- ARG ARGENTINA
- AUST AUSTRALIA
- NZ NEW ZEALAND
- S.A. SOUTH AFRICA
- UK UNITED KINGDOM
- USA UNITED STATES OF AMERICA
- U.S.S.R. UNION OF SOVIET SOCIALIST REPUBLICS

ANTARCTIC

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March, 1979

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NEW ZEALAND SEASON

DARWIN MOUNTAINS TO EREBUS

New Zealand's Antarctic research programme for the 1978-79 season, which ended last month, was the largest undertaken to date. In the four summer months it called on the services of more than 160 men and women. Seventeen field parties worked out of Scott Base and Vanda Station, and New Zealand scientists worked in Marie Byrd Land, on Mt Erebus, in the Darwin Mountains, and on the Ross Ice Shelf. As in past seasons they took part in other national programmes, and shared field work with scientists of five other nations — United States, Japan, Australia, France, and West Germany.

Of special importance was the virtual completion of the second stage of the Scott Base rebuilding programme — the erection of a new powerhouse and the installation of two new generators, and mechanical and electrical services. A combined Ministry of Works and New Zealand Army team did the job, and finished 85 per cent of it in time for the winter team at Scott Base to enjoy the luxury of adequate hot water and electricity during the cold and darkness of an Antarctic winter.

Eleven men and one woman began seven months of isolation officially on February 22 when the last three members of the summer team left Scott Base to fly back to New Zealand. Except for radio-telephone and telegraph links, the winter leader, Mr John Presland, of Christchurch, and his 11 companions will have no communication with the outside world until early September when the first pre-season flights by United States Navy Hercules aircraft will bring mail and fresh foods.

Deputy-leader this winter is Mr R.K. Vincent, a 27-year-old technician from Greymouth. His companions are: T.A. Stephenson (base engineer, Christchurch), R.N. Geddes (fitter-mechanic, Nelson), C.F. Cunningham (fitter-electrician, Christchurch), B. Trevathan (cook, Nelson), M.J. Challinor (post-

master, Auckland), A.M. Babington (Post Office radio technician, Hamilton), Thelma Rodgers (scientific officer, Christchurch), P.J. Cleary (field assistant-dog handler, Christchurch), A. Burt (technician, Christchurch), G. Abernethy (assistant maintenance officer-carpenter, Dunedin).

GLACIER STUDIES

New Zealand contributed a group of eight scientists and an Antarctic Division field staff of four to a major event in last season's United States research programme — the first intensive study of the Darwin and Byrd Glaciers. Scientists from seven United States institutions, and from Japan and West Germany, worked on various projects from a base camp in the area about 325km from McMurdo Station. They were flown to areas within a 185km radius of the base camp by three United States Navy helicopters.

A study of the geology, landforms, and soils of the northern Britannia Range between the Hatherton and Byrd Glaciers was made by an earth sciences team from the University of Waikato. Dr M.J. Selby (geomorphologist) led the team, and with him were Messrs P.J.J. Kamp (sedimentologist), D.J. Lowe (geochemist) and C.C. Law (petrologist).

Although the team was able to use helicopter flights for reconnaissance, for checking remote outcrops, and for landings on inaccessible peaks, the mapping of the range was done the hard way — man-hauling a 226kg Nansen sledge 70km down the Hatherton Glacier. In mid-November temperatures on the rough ice of the glacier were as low as minus 30deg Celsius, and wind speeds were often in excess of 60 knots. More moderate temperatures in the minus 5deg to minus 15deg range were experienced in December, but heavy hauling was needed over difficult mixed snow and ice surfaces to travel 15km in four to six hours.

METEOR SHOWER

A long day's man-hauling to the team's major supply dump at the junction of the Hatherton and McCraw Glaciers was rewarded the next day by an exciting and significant find — an important impact site of a shower of metallic nickel-iron meteorites. On December 11, while investigating the moraine deposits and geology on the north-east ridge of Derrick Peak above the Hatherton and McCraw Glaciers the team found six meteorite fragments. These were on a shoulder-like bench below the peak at an altitude of about 1500m, and were from 5cm to 25cm in diameter, and weighed one kilogram to 30kg.

Because of the extreme density of the fragments their transport by foot some 5km back to camp was an arduous task. The team celebrated the find with an extra ration of sledge biscuits, and then was rewarded for its labours by the surprise delivery by helicopter of a large cherry pie from the Darwin Glacier base camp.

When the find was reported by radio to the base camp on the morning of December 12 two members of the United States-Japanese meteorite search team, Dr W. Cassidy and Dr K. Shirashi, flew to the Waikato camp, and then were escorted to the meteorite impact site in the helicopter. Five more meteorites were found by the combined parties, and one more was found in another one-day search by the United States-Japanese party.

This occurrence of metallic nickel-iron meteorites has been described by Dr Selby as very significant because only three other discoveries have been made previously in Antarctica. Most of the finds, and the largest, a specimen weighing about 200kg, were made on the high-level bench on Derrick Peak. Other specimens were found on the slopes below down to the edge of the lateral moraines of the Hatherton Glacier. The fragments varied in size from one centimetre in diameter to the largest, a boulder 34cm in diameter.

SLEDGE TRIPS

After the meteorite finds the Waikato team man-hauled its sledge up the McCraw Glacier to its provisions dump in the Sabrina Valley. Then, before its return to the Darwin Glacier base camp, the team made other sledge trips, including one of 18km to Lake Wellman and the Waikato Basin, covering low-altitude moraine surfaces and visiting lower Beacon sediments for stratigraphic correlation of the Darwin and Britannia Mountains.

When the mapping of the northern Britannia Range had been completed, the Waikato team's geological work was tied into that already established for the Cook and Darwin Mountains to the north, and to the area south of the Byrd Glacier, the Churchill Mountains. This was done by a number of short helicopter visits during which detailed studies were made of the Beacon sandstones and their contact with the underlying basement rocks. Sedimentary formations were studied at Tentacle Ridge (Cook Mountains), Rainbow Mountain and Zeller Glacier (Churchill Mountains).

FOSSIL FINDS

Fossils which evolved between 500m and 600m years ago were discovered by two Victoria University of Wellington geologists who took part in the Darwin Mountains programme. Dr C.J. Burgess and Mr J.M. Anderson worked in the Byrd Glacier area, and their fossil discoveries were not totally new finds, but were in a new area, the northern Churchill Mountains. The geologists also discovered cave systems formed

more than 300m years ago in the ancient Shackleton Limestone.

When the geologists examined strongly folded limestone in a number of localities in the northern Churchill Mountains, they found that it contained marine fossils known as archaeocyathids. Other fossil faunas included green and blue-green algae, rare trilobite fragments, brachiopods, and trace fossils. A variety of sedimentary features suggested that the majority of the limestone was deposited in supratidal to very shallow subtidal conditions.

Dr Burgess completed his study of the Shackleton Limestone in the Byrd Glacier area late in December. Mr Anderson moved north to study the sedimentary geology of the Taylor Group, the bulk of which is thick quartzose sandstone. Only trace fossils were found in the area, and seemed to have no obvious environmental significance, but the studies indicated that in the Byrd Glacier area part of the Taylor Group has a marine origin.

Two scientists from the Soil Bureau, Dr G. Claridge and Mr I. Campbell, spent two weeks in the Darwin Mountains during December. They studied nitrates in soil formations found on some of the nunataks at the head of the Darwin Glacier, and also old glacial surfaces in the area.

VIOLENT ERUPTIONS

Violent eruptions, stormy weather, and damage to equipment, made it impossible for the international team on Mt Erebus to obtain gas samples from fumaroles in the active inner crater. Two New Zealanders were the first ever to descend into the inner crater on December 23, and Dr W.F. Giggenbach was within 20m of the crater floor when the first violent eruption occurred from the active vent.

This eruption showered the crater floor and the main crater with hundreds of lava "bombs," many still incandescent. In the 15 minutes after the explosion the level of the lava lake dropped 5m and then rose again.

Although the eruption was one of the strongest observed last season shock wave effects were minimal. Dr Giggenbach was hit above the right knee

by a small "bomb" still hot enough to ignite part of his clothing. But he, and his six colleagues on the inner crater rim were concerned about possible damage to the nylon ropes used in the descent. Therefore the attempt to reach the crater floor was called off so that the ropes could be checked.

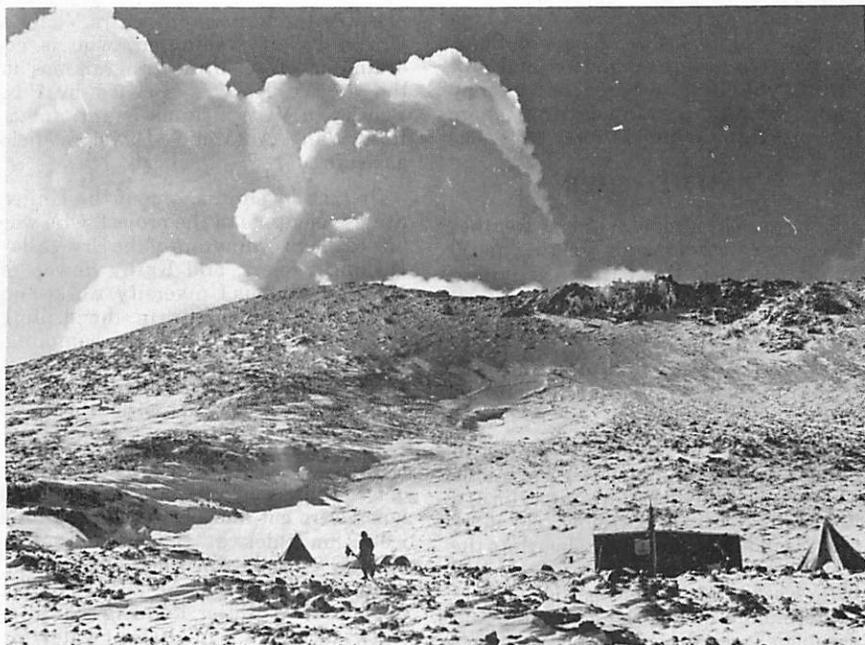
Nine men and one woman from New Zealand, France, and the United States, worked on Erebus between December 10 and January 3, studying its volcanic and seismic activity. The five New Zealanders were: Dr R.R. Dibble (geophysicist), C. Fink (surveyor), C. Monteath (field leader) Dr W.F. Giggenbach (geochemist), and C. Thompson (field assistant). With them was the noted French volcanologist, Dr H. Tazieff, who worked on Erebus in 1974-75 and 1977-78 seasons when planned descents into the inner crater were abandoned because of violent eruptions.

SEVENTH TIME

Back on the mountain for the seventh time was Dr P.R. Kyle, a New Zealand geologist now at Ohio State University, who began his studies of Erebus with a Victoria University of Wellington expedition. He headed the United States party, which included another New Zealander, J.R. (Harry) Keys (geochemist and field assistant), and two Americans, Kathy Cashman, who is doing a master's degree in volcanics at Victoria University, and W. MacIntosh (field assistant) from Ohio State University.

After acclimatisation at the Fang Glacier camp on the north-east slope of Erebus the New Zealand party was lifted by United States Navy helicopter to the summit camp about 200m below the rim of the main crater. This time the party pitched its polar tents beside a hut provided by the United States National Science Foundation to facilitate scientific work on the mountain.

Preparations were made to enter the inner crater on December 18, but the attempt had to be postponed because of unfavourable wind and humidity conditions. There were frequent eruptions, ranging from none to six a day, and lava "bombs" up to 5m in length were hurled up onto the main



Steam from the active inner crater of Mount Erebus rises high above the summit camp of the New Zealand, American, and French team which worked on the mountain last summer. The camp is between 91m and 121m below the rim of the main crater. To the right is Mt. Erebus Observatory, a wooden insulated hut build for the United States Antarctic research programme.

Antarctic Division photo:

crater rim and floor. On December 19 one "bomb" hit a coil of ropes near the inner crater rim and burnt it through in many places.

Between December 19 and 21 the United States party was lifted from the Fang Glacier camp to the summit camp, and during the morning of December 23 Dr Tazieff returned to Scott Base. In the afternoon another attempt to enter the inner crater was made.

FIRST DESCENT

First to make the descent after the inner crater had been quiescent for 14 hours was Coin Monteath. Wearing a helmet and protective clothing, and carrying a gas mask, he abseiled down on ropes anchored close to the halfway point on the inner crater rim. He reached a point some 70m below the rim, but it was found that both descent and belay rope were too short to reach the inner crater floor.

This descent was made about 4 p.m. An hour later Dr Giggenbach began the second descent, the belay point having been moved, and another length of rope tied to the descent rope. He encountered no problems, but just as he was about to disentangle a length of extra rope the eruption occurred, and a shower of volcanic debris, ranging from ash to "bombs" the size of footballs, rained down the inner crater wall.

A Z-pulley rope system had been installed on the main crater floor so that anyone could be hauled up from the inner crater in 10 to 15 minutes. After a discussion by portable radio the descent was called off, and Dr Giggenbach was able to make a rapid ascent without any difficulties.

There was another eruption of similar size to the first at 8.25 p.m. when the party was leaving the main crater to return to the summit camp. Once again

the area was showered with lava "bombs" of all sizes. The eruptions, followed by high humidity and low visibility in the crater area, and later by high winds, prevented any more descents into the inner crater.

BAD WEATHER

After Christmas the weather deteriorated, and winds gusting to 50 knots curtailed the party's activities. One polar tent was blown several hundred metres downhill from the summit camp, and another was badly ripped. No more attempts to obtain gases from the inner crater could be considered.

Although he had to work in temperatures of minus 20 deg to minus 25 deg Celsius on the main crater rim at a height of 3794m, Dr Dibble had more success in his studies on Erebus than the rest of the New Zealand team. He had two weeks of fine weather before Christmas to make seismic, sound, and magnetic recordings of the volcano's activity. On his third visit to Erebus he found that small earthquakes were as numerous as in December, 1974, but larger ones, including explosion earthquakes, were less frequent.

Bad weather, however, prevented Dr Dibble from testing the viscosity of the lava lake in the inner crater of Erebus. He planned to make measurements with spears dropped from a pulley along a cable strung over the lava lake, but the high winds kept breaking the wire.

SEABED DRILLING

Next summer a second attempt to drill into the seabed sediments of McMurdo Sound, using the annual sea ice as a drilling platform, will be made by United States, New Zealand, and Japanese scientists. The purpose of the international project, known as the McMurdo Sound Sediment and Tectonic Study (MSSTS) is to obtain a record of the initiation and early history of the East Antarctic ice sheet, and to time the rise of the Trans-Antarctic Mountains in the McMurdo Sound region.

Last season sites for two drill holes were selected by Dr P.J. Barrett, director

of the Antarctic research centre, Victoria University of Wellington, who is co-ordinator of scientific programmes in the project. He was assisted by P.N. Bentley, a VUW field assistant, and S. Ross, an Antarctic Division field assistant.

Dr L.D. McGinnis, one of the United States scientists in the project, who was one of the co-ordinators of the Dry Valley Drilling Project, and Kathy Power, of Northern Illinois University, worked on current measurements in the drilling areas and seabed sediment sampling. Both projects were assisted by two West German scientists, Dr H. Hoefle and D. Grund, who worked with the New Zealand programme last season.

Each site was selected after determining the local bathymetry. Then holes were cut and blasted through the ice (2.8m thick at the off-shore site. MSSTS 1, and 4.1m thick at the near-shore site, MSSTS 2). MSSTS 1 is 15km north-east of Butter Point in 200 m of water. MSSTS 2 is in 110 m of water, the deepest part of Explorers Cove, and is 4km east of the Dry Valley Drilling Project holes 8-10 in the New Harbour area at the entrance to the Taylor Valley.

Seismic refraction lines were shot through each site for current measurements and seabed sediment sampling. Basement was found at 880m at MSSTS 1 and at 380m at MSSTS 2 beneath the sea floor. No currents were detected in measurements every three hours for 24 hours.

MAGNETISED ROCKS

Another VUW party spent several weeks in south Victoria Land taking oriented samples of the Beacon Supergroup sandstones for measurement of their magnetisation by a cryogenic magnetometer, which will enable geophysicists to establish a magnetic stratigraphy and polar wander curve for Antarctica that can be compared with the surrounding continents. Dr D.A. Christoffel, of the VUW physics department, and his field assistant, P. Garden, sampled more than 600 sites on Mt Bastion at the head of the Victoria Valley; Beacon West, overlooking the Taylor Glacier; and Table Mountain at

the junction of the Taylor and Ferrar Glaciers.

Although they experienced many days of snow and temperatures as low as minus 30 deg C, the two men were able to collect samples spanning a time period from the Cambrian (500m to 600m years ago) to the Triassic (200m years ago).

Their light-weight rock coring equipment adapted from a hedge-cutting machine, performed well despite the difficult conditions. Part of the section covered contained fossil trees, coal, and fresh water fish, suggesting that the region or there were significant differences in the climatic patterns.

Scott Base huskies' new homes

Four huskies born at Scott Base in the last two years now have different masters. This season three went to Australia bases, and the fourth, which spent last winter at McMurdo Station has remained there as the official station mascot.

Noogis (Nugis), named after one of the dogs in Scott's last expedition, who was born on October 24, 1977, and Vida, born in July last year, are furthest from their birthplaces. They were flown from Scott Base to Melbourne, and then travelled south to Mawson in the relief ship Thala Dan. Two huskies from Mawson, Dick and Klari, are now at Scott Base, having travelled the same way in reverse.

A remote neighbour of Noogis is his sister, Rita, who is 1395km away at the Australian base, Casey. She and Dune, who were from the same litter as Noogis, were at McMurdo Station last winter.

Rita is now the Casey mascot, replacing Suzie, who was born at the station during its first year of operation in 1969, and died towards the end of last year. She was given to the Australian Antarctic Division by the New Zealand Antarctic Division. Dune has become the American mascot.

Rita was a passenger on a United States Navy Hercules which made the first of two proving flights of 2200km from McMurdo Station to Casey Station on January 24. Noogis was flown to Christchurch aboard a Hercules, but it was not his first flight. He took to the air when he was only six weeks old in December, 1977, when the Scott Base dog handler, Steve Chambers, took him on a 90km helicopter flight to Mt Rucker in the Royal Society Range.

Tentative arrangements for the exchange of huskies between Scott Base

and Mawson were made by Dr R. Garrod, director of the Australian Antarctic Division, when he visited the New Zealand base in the 1976-77 season. The exchange of sledge dogs is designed to improve the blood-lines in the huskies of both countries. There have been no huskies at Casey since 1970 except for Suzie, but Mawson has about 25.

Huskies were last exchanged between the two stations in December, 1961, when two six-week-old pups, Terry and Colette, were flown from Scott Base to New Zealand. They were carried to Australia in the Waimea, and the Nella Dan transported them to Mawson.

New blood was last introduced into the Mawson lines early in 1963 when a Greenland dog arrived on the Nella Dan. This was one of three sent as a gift by J. Lauritzen, the Danish company from which A.N.A.R.E. has chartered expedition ships for more than 25 years. The other two dogs went to Davis and Wilkes (now Casey).

Scott Base last had an injection of new blood for its dog lines in the 1974-75 season when a bitch and dog were flown from the British Antarctic Survey base on Adelaide Island, off the Antarctic Peninsula.



In Marie Byrd Land snows and mist

By Peter B. Andrews

In the 1978/79 season the New Zealand Antarctic Research Programme was extended for the first time into Marie Byrd Land. For eight weeks a party sponsored by the New Zealand Geological Survey trekked to and fro through much of the Ford Ranges of western Marie Byrd Land collecting detailed information on the basement geology. An area of about 11,000sq.km was investigated and the party travelled 1150km by motor toboggan and sledge.

United States exploration (1934, 1940 and 1966-67) in which the late Professor Alton Wade, Texas Tech University, was prominent, and Russian investigations, preceded our visit. Our objectives were for New Zealand geologists to gain first-hand knowledge of the area, to make a detailed sedimentological and structural analysis of the Swanson Group, the metasedimentary mass, and to intensively sample all pre-Cenozoic rock units for geochronological and geochemical analysis.

In the process we hoped to resolve conflicts in the Russian and American interpretations of the geology, and to provide an accurate base for testing two current theories: (1) that western Marie Byrd Land and Campbell Plateau south of New Zealand were formerly contiguous; (2) that Marie Byrd Land was the source of the late Paleozoic and Mesozoic Torlesse sediments of eastern New Zealand.

The party consisted of Drs C. J. Adams, Institute of Nuclear Sciences, (geochronologist); P.B. Andrews, N.Z. Geological Survey, (sedimentologist); J. D. Bradshaw, University of Canterbury, (structural geologist), and P. Braddock (field leader). At 1730 hours on November 11, 1978, and under overcast conditions we took off from the ice runway at McMurdo Sound in a United States Navy ski-equipped Hercules. Three hours later we landed without incident on a south-sloping neve west of the Mt Little, in brilliantly sunny and calm conditions.

Apart from short spells at widely-spaced intervals that was the last of the ideal weather. We set up a depot at the landing site. The cache of the 1966-67 Marie Byrd Land survey was only a few kilometres away, but we saw no sign of it. Judging from the numerous snowfalls we experienced subsequently the cache must be well-buried.

The Ford Ranges occur within 100km of Sulzberger Bay of the Ross Sea, on the western edge of a large, snow plateau of low elevation. The main ranges run east-west, the highest peaks (1350m) occurring inland to the east, and the greatest relief (600m) occurring nearer the coast in the Sarnoff Mountains. Overall only the very tops of mountains and crests of ridges project above the ice and snow cover, the relief being low compared to that in the Transantarctic Mountains.

To the east and south away from the main ranges clusters of nunataks are the only features that break the generally rolling ice and snow surface. The main ranges are separated by glaciers of mostly gentle gradient. At places large areas of a glacier surface are extensively broken by crevasses (Boyd and Crevasse Valley glaciers), but nowhere are crevasses so widespread that the glaciers are impassable. We did, on two occasions, however, almost get ourselves into trouble by pushing on when whiteout conditions developed while travelling.

The feature that is very characteristic of the whole area and which caused us anxiety at times and hilarity at others is the very hard blue ice "pond". We were suspicious of it until we had gained experience. It is most common at low elevations and close to large rock outcrops, where it forms from freezing meltwater. Radiant heat from the rock appears to melt nearby ice and snow. The meltwater accumulates near the outcrops and subsequently refreezes to form pond-like depressions.

Because meltwater will freeze while flowing, the "ponds" are never level and commonly are sloping and undulating. The "pond" surfaces merge with the surrounding steep ice slopes; these steeper surfaces are windswept and as much wind-carved as meltwater in origin. They may extend several kilometres out from the rock outcrop before giving way to snow-covered surfaces. We encountered flowing meltwater from December 3 onwards, but never in such quantity as to inconvenience us.

TOBOGGAN TRAVEL

With the array of ice cleats fitted, the toboggans gripped the ice well, though the steeper slopes had to be avoided. The sledges towed behind the toboggans were another matter. The footbrake had to be used frequently but judiciously to stop the sledges from running wild and overturning; righting and relashing sledges very quickly becomes tedious! In time we modified and strengthened the retractable steel keels fitted to each sledge, such that when worked in conjunction with the footbrake they helped keep each sledge train under control. In fact spills were few. Chain brakes were rarely needed.

It is apparent from the above that we travelled around the area entirely by motor toboggan. We used two new Swedish Snotric machines each fitted with a two forward-speed and one reverse-speed gearbox and with a 16 hp Briggs and Stratton 4-stroke motor. They gave excellent service, starting readily and proving sturdy and reliable. Each toboggan towed two Nansen dog sledges, the rear of each pair fitted with

handlebars and footbrake. A driver and a brakeman can handle this array with ease.

We spent a week in the vicinity of the depot, mostly confined by poor weather, then started on a crude figure-of-eight traverse that enabled us to cover the area. Over a period of four weeks we worked our way west and north as far as the Fosdick Mountains, then after returning to the depot, worked east and south as far as the previously unvisited Lewisohn Nunatak. From there we returned to the depot, being lifted out during the early hours of January 6, 1979.

FOUR BLIZZARDS

The weather experienced was quite different from that typical of the Transantarctic Mountains. Light variable winds (up to 20 knots, but commonly two to five knots, and with extensive calm periods), frequent low cloud including mist and sea fog, and frequent falling snow were typical. Astonishingly, we experienced six separate snowfalls spread throughout the eight weeks. We did not measure each fall, but guess them to have ranged from three to 10cm, giving a total of about 30cm during the period.

Only four blizzards were experienced, two towards the end of November and two during the second half of December, the maximum gusts being 38, 52, 32, and 46 knots respectively. The mixture of falling snow, fog and blowing snow meant that marginal visibility to whiteout prevailed 40 per cent of the time; during several of those days we were camped alongside rock and were able to work along the ridges despite the whiteout conditions.

Although winds blew from every quadrant to some time or another, the orientation of sastrugi and larger wind-shaped snow features shows that the predominant wind is from the north. Relatively low temperatures were experienced for the first two weeks (-15° to -29°C being typical). Thereafter temperatures rose and hovered just around freezing for the remaining six weeks.

Despite the disruptions caused by the poor weather, we managed to complete the programme we had set ourselves, if only because during the last quarter of the traverse we saw nothing new and different that required detailed work. We have resolved previously conflicting accounts of the geology of the area, and our field observations add substance to the two theories we were testing.

From our field observations and from preliminary assessment of Swanson Group structure and paleocurrent plots, it appears that the geology is very similar to the basement geology of central and southern Westland. Further, from their compositions and ages the older rock units could well have supplied the Torlesse detritus. Conclusive statements must await laboratory

analysis of the large volume of samples collected.

During the first few weeks snow petrels were our frequent though silent companions, and during the second half the inquisitive skua gull often sought us out and checked us over. The disappearance of the snow petrels must have coincided with the beginning of their breeding season, a large breeding colony being sighted by Peter Braddock and Chris Adams on Saunders Mountain on December 4, approximately the last time we saw petrels.

Lichen and moss, particularly the former, are common, frequently being seen among the rock debris of scree and sheltering in solid rock crevices. There appear to be at least six species of lichen and two species of moss. The latter were sketched by Peter Braddock.

Warm weather aids Onyx flow

Because the Antarctic summer was unusually cold in the 1977-78 season the Onyx River, the only river on the continent worthy of the name, failed to flow into Lake Vanda for the first time in 20 years. But it resumed its old habit last season, helped on its way by warm November and early December temperatures, and flowed over the Lake Vanda weir at 5.53 a.m. on December 29.

One of the few rivers in the world that flows inland, the Onyx, fed by melt water from the Lower Wright Glacier, rises at the coastal end of the Wright Valley. Usually it begins to flow on its 30km course to Lake Vanda about mid-December, and by January is flowing freely.

Last season it made good progress, and in mid-December was reported to be flowing at 12m a minute in Bull Pass through the Olympus Range, and still coming. It was helped on its way to ice-covered Lake Vanda by a comparative heat wave at Vanda Station on December 28.

Temperatures at Vanda rose to 13.2deg Celsius, the second highest figure recorded since the station was established in 1968. Scott Base also

sweltered on the same day after snow and bitter winds of 35 to 40 knots on December 26. The mercury climbed to 5.8 deg, making December 28 the warmest December day for 19 years, and the maximum temperature one degree short of the base record of 6.8deg established in January, 1970.

On the ice shelf one New Zealand field party was also caught in the heat wave. Members of the University of Canterbury party at White Island 40km from the base reported that their tents were sinking in the fast-melting ice.

"Antarctic Index"

An index to Volume 7 of "Antarctic," which covers the years 1974 to 1976, is now available at a cost of \$1. Subscribers can obtain copies from the secretary of the New Zealand Antarctic Society, P.O. Box 1223, Christchurch. Overseas subscribers are asked to ensure that their remittances are converted to New Zealand currency.





Looking down on a section of the Edsel Ford Ranges in Marie Byrd Land where a New Zealand research team worked last season. In the left foreground is the Bailey Ridge, and beyond it is the Sarnoff Range. The Asman Ridge is in the right foreground, and the Swanson Mountains are beyond it. Saunders Mountain rises to the left of the Swanson Mountains, and in the far distance at the top right are the Fosdick Mountains.

U.S. Navy photo (1962)

Two proving flights to Casey Station

Australian scientists will be able to work longer in Antarctica during the summer as a result of two proving flights between McMurdo Station and Casey Station by a United States Navy Hercules aircraft on January 24 and 31.

These flights were made as part of a co-operative air transport system between the United States, New Zealand, and Australia. Last season Australia's first contribution to the system was four flights by Royal Australian Air Force Hercules aircraft between Christchurch and McMurdo Station early in December.

Next season the R.A.A.F. is expected to make four flights on the southern route, carrying American, New Zealand, and Australian cargo and passengers. In return the United States Navy will make two flights to Casey Station, probably early in November and late in January. This will enable Australian scientists to get into the field much earlier than permitted by the present systems of chartered relief ships, and spend up to eight weeks working from Casey Station.

Planning for the new system began in the 1977-78 season after a visit to McMurdo Station and Scott Base the previous season by the Australian Minister for Science and the Environment (Senator James Webster). During his visit Mr R.B. Thomson, superintendent of the New Zealand Antarctic Division, suggested the possibility of the R.A.A.F. flying through Christchurch in support of the Australian Antarctic programme, and offering aircraft space to the Americans in return for flights to Australian bases from McMurdo Station.

A site for a ski-way was selected and surveyed at Lanyon Junction about 22km east of Casey Station in January last year. The ski-way is 2505m long and at an elevation of more than 900m on the Polar Plateau. There are no refueling facilities at Lanyon Junction, but their provision in future summers is under consideration as flights to Mawson

Station from McMurdo Station may follow in later years.

First to make the flight to Casey Station on January 24 were Dr R.I. Garrod, director of the Australian Antarctic Division, Dr E. Todd, director of the Division of Polar Programmes for the United States National Science Foundation, and two Antarctic Division officers, Messrs. A. Argent (aviation officer) and I. Holmes (building officer). Another important passenger on the 2176km flight, which took four hours and a half, was Rita, a sledge dog from Scott Base, given by the New Zealand Antarctic Division to replace Suzie, the mascot at Casey Station, who died last year.

Most of the men from Casey were at Lanyon Station to welcome the Hercules and its passengers. Dr Garrod and his companions were met by the officer-in-charge, Mr D. Twigg, and driven to the station. Because of the lack of support facilities the Hercules remained at Lanyon Junction for only two hours, and kept its engines running.

Dr Todd returned to McMurdo Station the same day, but the rest of the party remained until the arrival of the second aircraft, which made the official flight on January 31. One Australian who had to return home for personal reasons was able to travel by air instead of waiting for the relief ship *Thala Dan*. Mr Richard King, deputy officer-in-charge last winter, flew by United States Navy

Hercules from Casey Station to Christchurch by way of McMurdo Station, and then on an airline flight to Melbourne.

Appropriately Senator Webster and Mr Thompson represented their countries on the second proving flight. It was a nostalgic occasion for Mr Thomson. In 1962 he was the officer-in-charge at Wilkes, the forerunner of Casey Station, from where he led a traverse to the Soviet station, Vostok — the longest traverse ever made by an Australian expedition. He returned to Vostok in 1969, but had to wait 16 years to see the remains of his old station again.

FRESH FOOD

With Senator Webster were Senator D.S. Jessop, chairman of the Senate committee on science and the environment, Senator R. Bishop, chairman of the Parliamentary joint committee on foreign affairs and defence, Dr J.L. Farrands, Secretary of the Department of Science and the Environment, and five Australian news media representatives. On their flight from McMurdo Station they brought lettuces, tomatoes, cucumbers, and fresh eggs, for the men at Casey.

Two Bell Jetranger helicopters from the relief ship *Thala Dan*, whose arrival had been timed to coincide with the flight, ferried the visitors from Lanyon Junction to the station. There they were welcomed by a crowd of nearly 75 men — last season's team ready to return home, this winter's team, and a contingent from the *Thala Dan*.

Because the Hercules was on the ground for slightly more than two hours and a half the official part of the visit was short and informal. But there was time for speeches, an exchange of gifts, afternoon tea, champagne, and a quick tour of the base. To commemorate the flight Senators Webster and Jessop presented to the station a framed portrait of a former Governor-General, Lord Casey after whom the base was named in 1969.

Senator Webster also handed a naturalisation certificate to Mr Michael Stone, of Perth, the second person to be granted Australian citizenship in Australian Antarctic territory. Mr Stone, who comes

from Britain, expressed a wish to become an Australian citizen while he was serving at Casey, and the officer-in-charge, who was authorised by the Department of Immigration and Ethnic Affairs to perform the ceremony, did so on January 30. Another man serving at Mawson has also been granted citizenship there.

RITA'S SEAL

Rita set the seal of approval on an historic occasion when she lay on her back to acknowledge a parcel bearing her name which Mr Thomson handed over to the Australians. It contained her own brush and comb, rubber boots, special dog biscuits, and — as she has learned to drink beer — a can of New Zealand's Lion brand. Unlike the working dogs at Scott Base Rita has her own brush and comb because she was the guest and pet of the Americans at McMurdo Station last winter.

On the way back to Lanyon Junction to board the waiting Hercules the pilot of one of the Australian helicopters flew 2km from Casey and made a low pass over the old Wilkes station. Mr Thomson was able to look down on buildings he had last seen in 1963 when he left the station aboard the *Thala Dan*.

When the Hercules returned to McMurdo Station in the early hours of February 1 it brought back not only Australian passengers but Australian cargo. The men at Casey had placed aboard the aircraft a package of Australian beer as a reminder of home from Australians working with the United States Antarctic research programme.



McMurdo Station to be rebuilt

A \$10m programme for the rebuilding of McMurdo Station, which was established on Ross Island in 1956, began last season with the demolition of two old buildings. The upgrading of the station will span five summers, and follows the visit in the 1977-78 season of a planning team commissioned by the United States National Science Foundation to study the development of Antarctic bases over the next 30 years, and decided how McMurdo Station can be made more cost effective in supporting scientific programmes.

Rebuilding of the United States naval support force base at Christchurch Airport is also being considered by the National Science Foundation. The base was established at the airport in 1959, and half the buildings, once wartime barracks, are overdue for replacement. The foundation leases the buildings for \$48,000 a year, but maintenance now amounts to \$190,000 annually.

Scott Base is another Antarctic base established for the International Geophysical Year, which is also being rebuilt to meet the demands of New Zealand's expanded research programme. The first stage of a five-year programme was completed in the 1976-77 season with the

building of a science laboratory, and last season the second stage — erection of a new powerhouse — was finished.

Now the possibility of accelerating the rebuilding programme is being considered. The new base is scheduled for completion in the early 1980s, but could be finished in three years instead of five.

This hope was expressed by the Associate Minister of Finance (Mr Hugh Templeton) after he spent a week at Scott Base last season, accompanied by senior departmental officers. He also said that the Government hoped to develop New Zealand's Antarctic research programme on a five-year basis so there could be greater planning continuity.

New Zealand and Australian cargo airlift

More than 240 tonnes of cargo and 364 passengers were carried by Hercules aircraft of the Royal New Zealand Air Force and the Royal Australian Air Force between Christchurch and McMurdo Station last season. Sixteen flights were made in late November and early December to provide logistic support for the New Zealand, United States, and Australian research programmes in Antarctica, and share in the airlift of men and materials by United States Air Force Starlifters.

New Zealand's main contribution to the United States-New Zealand logistic pool last season was 12 flights, three more than in the previous season. The Hercules aircraft of No. 40 Squadron

carried more than 185 tonnes of cargo and 285 passengers on these flights before the sea ice runway in McMurdo Sound became unusable for wheeled aircraft.

For the first time Australian Hercules aircraft operated through Christchurch last season and contributed to the United States — New Zealand pool under a tripartite agreement which next season will enable Australian scientists to be flown from McMurdo Station to Casey Station for summer research work. The R.A.A.F. used its new C-130H aircraft for its four flights, carrying more than 55 tons of cargo and 79 passengers between Christchurch and McMurdo Station.

U.S. science projects last summer

One of the major projects in the United States Antarctic research programme next season will be the establishment of a remote field camp in the Ellsworth Mountains about 2400km from McMurdo Station. About 30 scientists will make geological, geophysical, and glaciological studies in the Heritage and Sentinel Ranges, supported in the field by helicopters from the base camp.

Next season's project will be modelled on the successful intensive study of the Darwin and Byrd Glaciers last season by more than 50 scientists from seven United States institutions, and New Zealand, Japan, and West Germany. Buildings and equipment brought back from the Darwin Glacier base camp last season will be flown to the Ellsworth Mountains from McMurdo Station by United States Navy Hercules aircraft, and three helicopters will support satellite tent camps used by field parties.

Last season's Darwin-Byrd project was the largest in the United States programme for which more than 320 scientists, including 28 women, and representatives of 12 other countries, worked during the 1978-79 summer. A major project which began in the 1973-74 season, ended in January this year. This was the Ross Ice Shelf Project, planned originally to study the biological, chemical, and physical characteristics of the unique environment under the thick shelf ice.

Field activities began in the 1973-74 season, and drilling through more than 400m equipment delays, and financial and logistical constraints, drilling did not begin at J9, and drill camp 644km south-east of McMurdo Station, until 1976. But the project was terminated when ice flowing under the pressure of its own weight blocked the drill assembly when the hole had reached a depth of 33.3m.

Success came in 1977 when a new flame-jet drill normally used in cutting granite burned through 377m of ice to the waters of the Ross Sea under the shelf. This hole was kept open for three weeks by drilling every three or four days, and

scientists were able to lower a closed-circuit television camera and study marine life in the frigid sunless waters which had been hidden by ice for at least 120,000 years.

Since its inception the Ross Ice Shelf Ice Project has been an international project, and scientists have come from Australia, Denmark, Britain, New Zealand, Norway, the Soviet Union, Switzerland, and West Germany, to work with teams from United States institutions. Last season 35 scientists from six countries — Australia, Norway, Britain, the Soviet Union, New Zealand, and the United States — worked in the project between October and January.

HOT WATER SYSTEM

No difficulties were encountered in drilling four access holes through the ice shelf last season. Three were drilled using a new hot water system which produced larger and "cleaner" holes, and the drillers were able to penetrate 416m of ice to 235m of water below more easily. The fourth hole was drilled by a Soviet field team which used an alcohol-piston thermal drill to obtain ice cores and study freezing-melting processes at the bottom of the shelf.

One hole was drilled to enable Norwegian investigators to measure the mass balance and heat flow of sea water below the shelf, and the variability of the temperature and currents. Freeze-in thermistors were placed at various depths, and also two current meters. A tape recording system was installed to record data this winter, and will be recovered during the 1979-80 season.

Biologists were able to use the main access hole, which was 0.9m in diameter,

by Dr Edward J. Zeller, of the University of Kansas, and two West German geologists, Volker Thoste and Wolf Kopp. The field team, which used an airborne gamma-ray spectrometer, also discovered a massive deposit of calcite south of the Byrd Glacier.

Between October 30 and December 23 the team covered 5559km in the Trans-

Antarctic Mountains between 79deg and 81deg S, and surveyed most of the exposed area south of the Byrd Glacier to the Mulock Glacier. The United States Navy helicopter carrying the gamma-ray spectrometer flew at a height of 15m at a speed of 60 knots, and radiation from the ground or exposed rocks below indicated the presence of uranium, thorium, and potassium 40.

A radiation anomaly at the base of the Beacon Sandstone in the Brown Hills conglomerate indicated the presence in a number of areas of what was believed to be thorium. This was the first time any major radiation anomaly had been recorded in exposed rock in Antarctica. Dr Zeller and his colleagues found this especially interesting because the anomaly was confined to the basal beds of the Beacon Sandstone.

South of the Byrd Glacier in the upper part of the Zeller Glacier the survey team discovered a deposit of dazzling white rocks at least 200m long which was believed to be made up of ancient evaporites. But an analysis of samples of the rocks later indicated that they were mables, and not true evaporites.

Another result of the survey was an enlargement of the enlargement of the geological mapping of the area covered by the field team. Older geological mapping was incomplete, and the base of the Beacon Sandstone was found to be much further inland.

RARE METEORITES

More than 300 meteorites ranging in size up to 150kg were found in southern Victoria Land last season by a United States-Japanese team which continued a search first started in the 1976-77 season. Two of the specimens were of the rare type known as carbonaceous chondrites, so named because of their high

for about a month because of the efficiency of the hot water system. They used new fish traps and other devices to study the marine life below the shelf, but did not obtain any fish in their sampling. But they recovered more than 4000 crustaceans, mostly amphipods, and also some isopods (Scorpio trilobitoides). Only one isopod was captured in the 1977-78 season.

ICE CORES

With the assistance of United States drillers the Soviet team was able to drill a hole 127mm in diameter to obtain ice cores. In the previous season the hole was 76mm. To obtain direct measurements of the freezing or melting rate at the bottom of the shelf acoustical transducers were left in the hole for this winter. These will enable glaciologists and oceanographers to determine whether the ice at the bottom is melting or freezing and at what rate.

Ice cores taken 6m from the bottom of the shelf contained frozen sea water and briny ice, and provided the first evidence of freezing on the bottom at some point between the coastline and 99. The rate of freezing is not known, but the appearance of the ice and the structure of the crystals indicated it was freezing. Core analysis will reveal the age of the ice, and help to determine whether there is a freezing or melting process at the bottom of the shelf.

THORIUM DEPOSIT

Better water samples were obtained last season for water chemistry dating mainly because the hole from which they were obtained was cleaner. Eighty samples of sediment from the seabed below the shelf were also taken during the project, the largest being 1m long.

A survey to assess the potential resources of uranium and thorium in the exposed rocks of the Darwin Mountains area disclosed what appeared to be a fairly large deposit of thorium near the Brown Hills. The deposit is not considered to be economic.

This was one of the results of the survey, which began in the 1975-76 season, and was continued last season.

abundance of carbon. ("Antarctic," March, 1978. Pages 148-149).

When the first meteorites were found in Victoria Land in the 1976-77 summer nine came from the Allan Nunatak about 200km north-west of McMurdo Station, and when the searchers returned the next season they collected 310 meteorites, most of them from blue ice in the same area.

Last season the field team worked first from a camp near the Allan Hills, and in the first few weeks located more than 130 stony meteorites or chondrites in the area. Later the search moved to the Darwin Glacier area where 44 meteorites were discovered. Ten of these were of the very dense metallic, nickel-iron type.

New Zealand scientists engaged on a study of geology, landforms, and soils of the north Britannia range between the Hatherton and Byrd Glaciers joined in the search on December 11 when they discovered an important site of a meteorite shower on a ridge of Derrick Peak above the Hatherton and McCraw Glaciers.

Six metallic, nickel-iron meteorites were found in the first search by the University of Waikato team. On December 12 Dr W. Cassidy, leader of the University of Pittsburgh party, and Dr K. Shiraishi, leader of the party from the Japanese National Institute of Polar Research, flew to the site from the Darwin Glacier base camp. Five more meteorites were found by the combined parties, and another was found later by the American-Japanese team.

With Dr Cassidy in the search for meteorites were Dr Edward J. Olsen, curator of mineralogy and meteorites at the Field Museum of Natural History, Chicago who took part in the first search in 1976-77, and J. Annexsted, D. Clauter, and Urusula Marvin. Dr Shiraishi, F. Nishio, and M. Funaki were the Japanese representatives.

In addition to searching for meteorites the Japanese scientists made structural geological and petrological studies in the dry valleys of southern Victoria Land. They also collected more than 400 rock

samples in the dry valleys, and in the McMurdo Sound region for paleomagnetic study.

ICE SHELF CHANGE

Changes in the grounding line of the Filchner Ice Shelf which may be an indication that part of the shelf is thinning were confirmed by a Scott Polar Research Institute team which made a glaciological and geophysical exploration of the West Antarctic ice-sheet last season by airborne radio-echo soundings. A large lake — the first in West Antarctica — was located under the ice in the 1977-78 season. Last season's survey disclosed only some evidence of smaller lakes.

This was the Scott Polar research Institute's sixth season of radio-echo sounding of the Antarctic ice-sheet. The work is part of the International Antarctic Glaciological Project, and is done in co-operation with the United States National Science Foundation, and the Technical University of Denmark. Most of the sounding equipment was designed and built by the Technical University, and is installed in a Hercules aircraft provided by the National Science Foundation, and flown by the United States Navy's VXE-6 Squadron.

Between December 15 and December 29 the team completed 11 missions, and in 130 hours of flying did about 22,000km of on track radio-echo sounding. Two and a half of the missions were to the Dufek intrusion in the Forrestal Range of the Pensacola Mountains to provide magnetic data for geological and geophysical investigations by the United States Geological Survey, and paleomagnetic studies by scientists from Western Washington State College. One flight was made to Dome C in Wilkes Land in support of I.A.G.P. studies there.

Most of the on station flying in West Antarctica last season was done between the Sentinel Range of the Ellsworth Mountains and Byrd Station. One flight was made along a line to the Thwaites Glacier and Pine Island Bay.

In the 1977-78 season the team filled in a 100km square grid in the area — the

geological junction between West and East Antarctica. Originally the intention was to extend the grid to the Pacific coast and the base of the Antarctic Peninsula. But last season it was decided to consolidate the previous season's work and provide a very detailed 50km grid covering 600,000 square kilometres in the area.

When the team established the position of the Filchner Ice Shelf grounding line in the 1977-78 season it that the mapped coastline between the Heritage Range and the Antarctic Peninsula was decidedly in error. Two extra flights to the area last season confirmed changes in the grounding line configuration.

In one area which appeared to be an incipient grounding zone the echoes

were clearly not ice shelf echoes, and were not like typical rock echoes. There was a possibility that the shelf area might be settling on sediments on the sea floor, but the echoes were not true water or stong grounded rock echoes.

An examination of Soviet satellite photographs of the shelf, however, showed that the grounding line was not so distinctive. This might be an indication that the shelf was thinning.

The flight to Dome C in East Antarctica was made to support glaciological and geophysical investigations of the area by scientists from Ohio State University and the University of Wisconsin. The aircraft flew a box 50km square with grid lines spaced 10km apart.

Caretakers for Historic Huts

For nine seasons since the 1969-70 summer volunteers from the New Zealand Antarctic Society have worked on the repair and maintenance of the historic huts on Ross Island at Cape Royds, Cape Evans, and Hut Point. Two members of the society will have the opportunity to spend three weeks in the Antarctic next season as hut caretakers.

Applications to the Canterbury and Wellington branches of the society for the posts close on May 30. South Island members can obtain application forms from the Canterbury branch secretary, P.O. Box 404, Christchurch. North Island members can apply to the Wellington branch secretary, P.O. Box 2110. The selected caretakers will be required to attend the training camp at Tekapo for the Antarctic research team, and will go south in December.

Caretakers will be selected by the superintendent of the Antarctic Division from nominations made by the two branches of the society. The historic huts project is part of the New Zealand Antarctic research programme, and special clothing, transport, food, and accommodation, are provided by the Antarctic Division.

Certain qualifications of value to anyone applying have been suggested by the Antarctic Division. These include interest in one or more of the Antarctic research projects, particularly biology or meteorology, and knowledge of or interest in the historic huts, and the conservation of fauna and flora. Other suggestions are that applicants should have practical experience in some trade or profession, and mountaineering and/or tramping experience.

Survival courses

About 240 men and women took part in coursed in basic snowcraft and survival conducted by three New Zealand mountaineers from Scott Base last season, Carl Thompson (field leader), of Hamilton, and his field assistants, Andy Brown (Greymouth) and Jim Graham (Christchurch), ran 40 courses in three months for the Antarctic Division.

These courses are held every season for American and New Zealand research staff, United States air crews, United States Coast Guard icebreaker crews, and crews of Royal New Zealand Air Force aircraft.



When Camp Juliet Springs was established on the Ross Ice Shelf 644km south-east of McMurdo Station last summer it had a heated swimming pool and a solitary palm tree. But any resemblance to Palm Springs, California or similar resorts, was purely coincidental. The palm tree was plastic, the hot water in the plastic pool came from snow.

To drill through the ice shelf to the waters of the Ross Sea far below the Ross Ice Shelf Project scientists used a hot water drill. But before the drill could penetrate the solid ice it had to pass through 60m of firn (old compact snow).

For the first stage a 2000-gallon holding tank was built of plastic on a rigid frame. A heating coil was placed on the bottom to melt snow dumped into the

tank by a bulldozer, and the water was heated to a temperature of 41deg Celsius.

With the addition of a plastic palm tree and a lifebelt for emergencies the tank also became a swimming pool for the hard-working scientists. When the photograph above was taken in late November the temperature above the water was minus 10 to 15deg C. The only disadvantage was that wet hair quickly froze when the swimmers emerged from the hot water.

After the drill reached a depth of 416m through the ice shelf the scientists were able to enjoy the strange experience of swimming in water which had been hidden by ice for at least 120,000 years. The melted snow water was replaced by sea water although the drill site was 482km from the edge of the ice shelf and the Ross Sea.

Airlift to new station in West Antarctica

A new scientific station has been established in West Antarctica. It replaces the 10-year-old Siple Station 2250km from McMurdo Station at the base of the Sentinel Range in Ellsworth Land, now buried under nearly 10m of snow. In the last two seasons construction teams and aircraft crews have worked against time and the unstable weather of Ellsworth Land to complete the most isolated United States station in Antarctica.

One of the most vital tasks in support of the research programme — an airlift of men and more than 360 tonnes of materials — was performed last season by United States Navy Hercules aircraft of VXE-6 Squadron. Starting in November the squadron's crews made 70 flights between McMurdo Station and old Siple Station where a temporary summer construction camp was established. With a refuelling stop at the Byrd Station surface camp each flight took an average of five hours each way.

Everything needed for the new station was carried to the site by air. VXE-6 Squadron aircraft not only carried the men and materials; they also flew in summer and winter research teams and the supplies and fuel needed to support time. In the 1977-78 season nearly 350 tonnes of materials were flown in.

Ellsworth Land gave the new station a stormy welcome when VXE-6 Squadron, and the construction team from Holmes and Narver, civilian contractors to the United States National Science Foundation, had completed their task. Siple II was officially opened in a fierce snowstorm, accompanied by a temperature of 15deg C and a 48 km an hour wind. The ceremony was brief. An American flag which had flown over the site of the last two years was lowered, and Dr Edward P. Todd, director, division of polar programmes, for the National Science Foundation, dedicated the new station and raised a new flag.

Designed for a life of 10 years, the new station consists of 24 modular units protected by a metal arch 85.9m long and

13.4m wide. These modules provide living quarters for eight men, and the necessary life support elements of a power plant, snow melter for water, communications, and other facilities. With an annual snowfall in the area of 1.5m the whole station will be buried eventually like the first station, which was first occupied in 1969, and became a permanent winter station in 1973.

On February 11 a VXE-6 Hercules made the last flight of the season to the new station. When it returned to McMurdo Station eight men remained behind for the winter. They will be completely isolated for more than nine months except for radio communication.

As in past seasons Hercules aircraft flew to other remote parts of Antarctica to support the scientific projects. In their two busiest months — October and November — they flew 1600km from McMurdo Station to place New Zealand and United States field teams in Marie Byrd Land, relieved the Amundsen-Scott South Pole Station, and flew almost daily to Siple Station. Nearly 90 flights were made to the Pole to resupply the station for summer operations and the winter. The last flight was on February 11.

GLACIER CAMP

Establishment of a base camp on the Darwin Glacier 340km south of McMurdo Station to support the main project of the summer research programme — glaciological and geological studies of the Darwin and Byrd

Glaciers — was another task for VXE-6 Squadron in October. Cargo loads included five Jamesway huts, a generator shack, and survival tents. Three of the squadron's six helicopters also flew to the base camp to support scientists working from satellite tent camps within a radius of 185km from the base. Two months later all the buildings and equipment were lifted back to McMurdo Station.

One of the largest flights of the season was made on December 18-19 from McMurdo Station to the west and central Weddell Sea. A Hercules made the flight to drop six meteorological data buoys by parachute. The flight, which took 16 hours altogether, required most accurate navigation to place the buoys in the correct positions which ranged from 69deg 46min S to 75deg 31min S, and between 48deg 34min W and 58deg 26min W.

This flight was made in support of studies of the relationship of Antarctic sea ice to oceanic and atmospheric processes by the United States Army Cold Regions Research and Engineering Laboratory. The Hercules flew directly to the stations over the Weddell Sea, dropping the buoys over a three-hour period, and stopped at the Pole Station to refuel on the way back to McMurdo Station.

MERCY MISSION

In the first week of January another Hercules flew one of the longest missions in United States Antarctic air operations — from McMurdo Station to the main Soviet station, Molodezhnaya, in Enderby Land, and back to Dunedin, New Zealand. The mission was to pick up five men injured in the crash of a Soviet aircraft at Molodezhnaya on January 2. Later in the month the usual seasonal flights were made to another Soviet Station, Vostok, 1110km from McMurdo Station, on the Polar Plateau.

Other inland flights in support of the research programme were made to the Ross Ice Shelf Project drill camp, the Pensacola Mountains, and the Leverett and Robert Scott Glaciers. A photographic mission was flown to the Ellsworth Mountains in preparation for

a major science project next season, and the airborne radio-echoing sounding project entailed 130 hours of flying over a wide expanse of West Antarctica.

VXE-6 Squadron's helicopters flew many hours in support of the United States and New Zealand programmes. They were busy in the Darwin Glacier and Byrd Glacier areas, and shuttled back and forth across McMurdo Sound to the dry valleys. Local flights included lifting the New Zealand-American-French expedition to the summit of Mt Erebus, and visits to Cape Bird and Cape Evans.

CASEY FLIGHTS

For the first time a United States Navy Hercules flew to Casey Station, the Australian base in Wilkes Land, more than 2200km from McMurdo Station. Two proving flights were made on January 24 and January 31 as a prelude to regular flights beginning next season to transport Australian scientists for work at Casey in the summer months. In return the Royal Australian Air Force will provide logistic support for the United States and New Zealand programmes.

VXE-6 Squadron aircraft also operated deeper in Wilkes Land again last season. They made several flights to Dome C to establish a field camp, and support glaciological and geophysical investigations of the area by United States and French scientists.

To support the United States and New Zealand summer programmes, and maintain the American inland stations, aircraft of the United States Navy and Air Force, the Royal New Zealand Air Force, and the Royal Australian Air Force, carried a record amount of cargo and passengers to Antarctica last season. In the four months of the season they took more than 1330 tonnes of cargo south, and flew more than 320 tonnes back to Christchurch. More than 1850 passengers were carried between New Zealand and Antarctica.

Tonnage carried by sea also reached record levels. The tanker Maumee took 6m gallons of fuel to McMurdo Station compared with 4.7m in the previous

season, and the supply ship Schuyler Otis Bland was heavily loaded when she sailed from Lyttelton.

Once again the United States Coast Guard icebreaker Polar Star, and the Bland experienced trouble on their voyages south in support to supply operations. As a result the Polar Star was unable to continue cutting the sea ice channel in McMurdo Sound, the Bland arrived later than scheduled, and the Maumee was diverted to New Zealand to pick up priority cargo.

As in the previous season — her first in Antarctic waters — the Polar Star developed trouble in her variable pitch propeller system when she began to break the shipping channel. To guard against further damage her duties were taken over by the veteran icebreaker Glacier, and she stood by in support.

When the Polar Star sailed from Wellington on December 26 she called first at Campbell Island, and then supported science projects at Cape Washington, and in the Rosse Sea. She refuelled when the Maumee arrived, and sailed for Palmer Station early last month.

ICE CHANNEL

After a call at Wellington to pick up scientists who planned to do sediment coring off the Oates Coast and in the Ross Sea, the Glacier began the task of cutting a channel of between 21km and 24km through the sea ice in McMurdo Sound to enable the Maumee and the Bland to reach the ice wharf in Winter Quarters Bay. She completed the task by the end of January, and then led the Maumee up the channel on February 2.

Because of the delayed opening of the channel the Maumee had called at Lyttelton on January 19 and sailed the next day. She reached Winter Quarters Bay on her 10th trip south, and discharged her vital cargo for the winter and next summer — more than 6m gallons of aviation and Antarctic diesel fuel. On her way back to the United States she called briefly at Lyttelton on February 18 to bunker.

Originally the Bland was scheduled to sail from San Diego on January 13. But she was 225 miles off shore when she

experienced trouble with her turbine bearings, and had to be towed back to port. The turbine problems were fixed in five hours, but then she was delayed another 24 hours for repairs to her boiler feed water regulators.

This chapter of accidents did not end when the Bland reached Lyttelton on January 27 to load essential cargo for McMurdo Station and Scott Base. She had to return to port twice because of gyro compass trouble, and sailed finally on January 31.

As a result of these delays the Bland did not berth in Winter Quarters Bay until February 7. The next day her unloading was delayed by a storm and winds rising to 64 knots. But on February 15 the Glacier escorted her down the channel to the ice edge, and the two ships were the last to leave McMurdo Sound before the winter.

Before she sailed from Winter Quarters Bay for Port Hueneme by way of Timaru and Lyttelton the Bland loaded 300 and 600 cubic yards of marginally contaminated soil from the site of the nuclear power plant on Observation Hill. This was her third and last cargo; she took 7908 tonnes in the 1976-77 season, and about 4200 tonnes in the 1977-78 season.

Death in Fork-lift accident

A United States Coast Guard petty officer died after an accident at McMurdo Station on February 8. He was Raymond C. Porter, a 22-year-old single man, of Bellacre, Texas, and an electronics technician in the crew of the Coast Guard icebreaker Glacier.

Petty Officer Porter was one of 23 men from the Glacier who had volunteered to help unload supplies from the supply ship Schuyler Otis Bland, berthed in Winter Quarters Bay. He was fatally injured when a fork-lift truck he was driving overturned. Another fork-lift was used to free Petty Officer Porter, who was taken to the station dispensary where he died later.

U.S. Mercy Mission to Molodezhnaya

Three men were killed and 11 injured when an Ilyushin 14 transport aircraft crashed on takeoff from Molodezhnaya, the main Soviet station in Antarctica, early on the morning of January 2. The aircraft was on its way to Mirny when the port engine failed, and it crashed one kilometre from the ice runway. In the crash the pilot was killed instantly; the co-pilot and one passenger died a short time later.

Because the five most seriously injured survivors of the crash could not be given specialised treatment at Molodezhnaya the leader of the 24th Soviet Antarctic Expedition, Dr Y.S. Korotkevich, asked Captain D. Westbrook, the United States naval support commander at McMurdo Station, for assistance to evacuate his men to New Zealand. The message was received at 6.30 a.m. on January 4, and six hours later a ski-equipped Hercules aircraft of the U.S. Navy's VXE-6 Squadron took off on a flight of 3829km to Molodezhnaya.

Thirty-one hours later the five men were admitted to hospital in Dunedin. To bring them back from Molodezhnaya to New Zealand the Hercules flew a total distance of 11,212km. VXE-6 Squadron also flew extra fuel to the Amundsen-Scott South Pole Station because the mercy mission to Molodezhnaya had to make two stops there to refuel. Two flight crews took part in the evacuation flight, and two Soviet scientists working with the United States research programme flew in the aircraft as interpreters. Three men, Commander W. Morgan, commanding officer of VXE-6 Squadron, and two medical orderlies, T. Boxberger and S. Dame, were aboard for the duration of the mission from McMurdo Station to Molodezhnaya and back to Dunedin.

RETURN HOME

Four of the injured men spent more than a month in hospital, but were able to return to the Soviet Union early last month. They were Alexander Kostikov, aged 25, broken thigh; Fedor Epishin, 27,

broken leg; Vitold Rossikin, 36, leg injuries; and Alexander Tkachev, 38, broken ribs. The fifth man, Garib Uzikaev, aged 47, who suffered a fractured skull and severe brain damage, was still in hospital at the end of last month.

After more than two months in hospital Mr Uzikaev was flown back to the Soviet Union this month. He was accompanied by a New Zealand neurosurgeon and a nurse on the flight to Moscow.

Visibility was almost nil because of fog when the Hercules left McMurdo Station for Molodezhnaya. On board the Hercules, whose cargo department had been fitted up for hospital work, were a crew of eight, a flight surgeon, Lieutenant-Commander Caroline Deegan, the two medical orders, a photographer, and a Soviet exchange scientist, Dr E. Lysakov, who is wintering at McMurdo Station as a meteorologist.

On the flight to Molodezhnaya, which took five hours after the refuelling stop at the South Pole, Dr Lysakov acted as interpreter and weather observer. He obtained information on weather, winds, and navigational aids from Molodezhnaya for the pilot's use.

When the Hercules reached Molodezhnaya the coast and the skiway were hidden because of a broken layer of clouds. The first landing was waved off, but on the second attempt the pilot, flying mostly on instruments, was able to land. All the patients had been



Members of the 23rd Soviet Antarctic Expedition at Molodezhnaya carry one of their five injured comrades to a waiting United States Navy Hercules aircraft for transport to New Zealand after the crash on January 2 of an Ilyushin 14 in which three men were killed and 11 others injured. In the background is a Soviet Mi-18 helicopter which flew the five injured men from the station to the skiway.

U.S. Navy photo by Howard Weinger

brought to the skiway from the station by helicopter, and they were quickly carried aboard the Hercules. With them was a Soviet doctor, Dr Lev Goluben, who travelled all the way to New Zealand.

Shortly before midnight on January 4 the Hercules left Molodezhnaya. After a stop at the South Pole to refuel it reached McMurdo Station at 7.15 a.m. the next day. Because of Garib Uzikaev's brain injury — he was in a coma — a decision had been made on the way from Molodezhnaya to fly the five men to Dunedin where neuro-surgical facilities were available.

When the Hercules arrived at McMurdo Station medical staff, and helicopters with stretchers, were standing by. Navy volunteers were also ready at the station dispensary ready to give blood if needed. A crew change was made before the aircraft took off at 8.15 a.m. for Dunedin where it arrived at 4.19 p.m.

Lieutenant-Commander M. Boyer replaced Dr Deegan as flight surgeon for the final leg of the journey, and Dr Lysakov was replaced as interpreter by Dr I. Zotikov, who had been working with the United States research programme on the Ross Ice Shelf Project.

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. In mid-January last year a Soviet helicopter flew 700km from Mirny to pick up a seriously ill Australian radio technician from Davis Station. Then a U.S. Navy Hercules flew 2500km from McMurdo Station to Mirny and brought the man back so he could be flown to Christchurch on another aircraft for hospital treatment. Lieutenant-Commander Boyer and T. Boxberger, one of the medical orderlies on the flight to Molodezhnaya, took part in last year's evacuation.

Twenty-two men and one woman took part in the latest emergency flight. On the first leg to Molodezhnaya were: Commander Morgan, Lieutenant-Commander R. Brandt and Lieutenant J. Shay (pilots); Lieutenant S. Waylett and Lieutenant (j.g.) J. Johns (navigators); H. Gantz and H. Lennox (flight engineers); F. Jones (loadmaster); Lieutenant-Commander Deegan (flight surgeon); T. Boxberger and S. Dame (medical orderlies); H. Weinger (photographer); and Dr Lysakov (interpreter).

There were 10 men on the flight to Dunedin. They were Commander Morgan, Lieutenant-Commander F. Piazza and Lieutenant (j.g.) D. Boice (pilots); Lieutenant J. Vickers (navigator); J. Landy (flight engineer); W. Tucker (loadmaster); Lieutenant-Commander Boyer (flight surgeon); Boxberger and Dame (medical orderlies); Dr Zotikov (interpreter).



Four hurt in helicopter crash

Four men were injured when a United States Navy helicopter crashed with six people aboard about 43km from the Darwin Glacier field camp at 3.45 p.m. on January 7. Three of the injured were VXE-6 Squadron crewmen, and the fourth was a civilian with the research programme.

Those injured were: Lieutenant Daniel A. Ellison (cuts on head, bruised left arm and knee), Lieutenant John D. Williamson (sprained neck and back), Aviation Machinist's Mate Ellis G. Hatch (bruised ribs), William Pfeffer (compression fracture of the spine). All four were treated at the McMurdo Station hospital.

Three helicopters were based at the Darwin Glacier field camp for nearly three months to support geological and glaciological studies of the Darwin and Byrd Glaciers. The helicopter which crashed at a site known as Hill 870, was ferrying three members of the research programme to McMurdo Station.

After the crash the crew were able to salvage medical gear and a radio from wreckage. They were able to establish contact with the Amundsen-Scott South Pole Station, and news of the crash reach McMurdo Station at 4.40 p.m. over the air traffic control frequencies.

A Hercules left McMurdo Station at 5.38 p.m. for the 257km flight to the Darwin Glacier field camp. At 6.26 p.m. the injured men, who had been picked up at the crash site with the other two civilian passengers by two helicopters

from the field camp, were placed aboard the Hercules. It returned to Williams Field at 8.10 p.m.

First Antarctic live TV

Syowa Station and Tokyo were linked on January 28 by the world's first live television broadcast from Antarctica. The broadcast, in colour, was made by the Japanese Broadcasting Corporation (NHK) by way of the Intersat-A satellite, which is in orbit 36,000km above the Indian Ocean.

Programmes broadcast direct from Syowa until February 3 included scenes of life at the base, and conversations between members of the 20th Japanese Antarctic Research Expedition and their families in Tokyo. Twenty-three tons of equipment, including a parabolic antenna about 10m in diameter, were taken south by the Fuji for the transmissions, and JARE-20 included a team of 11 from NHK.

These transmissions were part of a series entitled "Antarctic in the Future," which started in Tokyo on January 1 with other video-taped programmes, including one on New Zealand's work in Antarctica, which was filmed by and NHK team towards the end of last year. The series, which cost \$1.5m, was introduced on January 1 by Sir Edmund Hillary, and Naomi Unemura, who reached the North Pole single-handed.

B.A.S. NEWS

Twin Otters carry heavy workload

Because of the withdrawal of the Royal Research Ship *John Biscoe* after she relieved South Georgia the British Antarctic Survey's two Twin Otter aircraft carried a heavier workload than usual last summer. Their main task was to fly summer field workers south, but in the three months after their arrival at Rothera they also flew to United States and Argentine bases, ferried scientists to Siple Station, Alexander Island, and George VI Sound, and dropped mail at Faraday (Argentine Islands) and the Argentine base, General San Martin, in Marguerite Bay.

When the *John Biscoe* sailed for Liverpool to undergo a major refit, having relieved South Georgia and established a field party on neighbouring Bird Island ("Antarctic," December, 1978) all other relief work had to be carried out by the R.R.S. *Bransfield*. Priority was given to taking men and supplies to the United States Palmer Station on Anvers Island, and to landing B.A.S. summer field workers nearby at Damoy Point for transport southwards by air.

Damoy was reached on December 12 and the *Bransfield* was able to relieve Faraday (Argentine Islands,) a few days later before she returned north. Dense pack ice, brought by persistent southeasterly winds, blocked access to Signy Island, so the *Bransfield* proceeded to South Georgia and then on to Halley. This was the first time that Signy had not been relieved before Christmas.

Halley was reached without difficulty in mid-January. Unloading conditions were ideal, and the relief was accomplished in the record time of three days. Signy was eventually relieved in late January and the *Bransfield* then returned to the Antarctic Peninsula and proceeded to Rothera.

Among the summer visitors to Signy were a number of senior headquarters staff and Professor G.E. Fogg, professor of marine biology, at the University

College of North Wales, who is chairman of the B.A.S. Scientific Advisory Committee. His son, also a biologist, wintered on South Georgia in 1975 and 1976.

H.M.S. *Endurance's* helicopters visited Signy a few days before the *Bransfield's* arrival and took in two B.A.S. men. A Soviet trawler fleet appeared off the base in December, but the sea ice prevented the ships from working the area.

AIR OPERATIONS

Preparations for the arrival of the two Twin Otters aircraft at Rothera, the centre for B.A.S. air operations, began in the first week of November. The Rothera "air terminal" (two cabooses providing simple accommodation) was established on the Wormald Ice Piedmont, 4.8km from the base, and supplied with 400 drums of fuel.

In addition, two men stood by at the old Adelaide base airstrip 64km to the south-west, in case an alternative landing site was needed. While they were there these two were able to entertain the French couple, Jerome and Sally Poncet, whose yacht *Damien II* had been dry-docked on nearby Avian Island for the winter.

The flight of the Twin Otters from Canada was uneventful, and they arrived safely at Rothera on November 14. Their first main Antarctic flight was to

the Argentine base, General Belgrano to pick up the three B.A.S. men who had been stranded there for the winter. Two days were spent at Halley, about 96km to the north-east, while waiting for the weather to clear for the return flight to the Antarctic Peninsula.

During this time, a flight was made to the VLF site 80km inland on the Polar Plateau where three men were retrieving the experimental equipment for re-engineering, and then to the Sweeney Mountains to collect geological specimens left there last season. The aircraft then flew to Fossil Bluff in George VI Sound because bad weather still prevented it from landing at Rothera.

MAIL DROP

One of the trio from General Belgrano was then flown to Vicecomodoro Marambiom, the Argentine base on Seymour Island. From there the man was flown north in an Argentine aircraft and thence home. A second member of the trio — a geologist — was taken to Hope Bay with a companion to do some field work. The aircraft then flew to Damoy Point and Palmer Station to inspect the airstrips and dropped mail at Faraday and General San Martin before re-turning to Rothera.

Three other geologists were landed at Hope Bay by the Bransfield, and the ex-Belgrano man embarked to return home. The four remaining men subsequently worked on James Ross Island, looking at seals as well as studying the geology.

Eleven summer field workers were landed at Damoy Point in mid-December and flown south. Of these, the geologists were ferried to the southern part of Alexander Island, geomorphologists to George VI Sound and glaciologists to the Eternity Range, to the Rutford Ice Stream (near the Ellsworth Mountains), the southern end of George VI Sound and to Siple Station. At the latter site one B.A.S. man and one Argentine scientist carried out a programme of ice-drilling.

On one of these flights a natural gravel runway was found on Alexander Island. This enabled the aircraft to make what was probably the most southerly landing on wheels.

The two aircraft also flew to Halley in December. One returned to Rothera while the other delivered fuel to General Belgrano and then continued work with the United States Geological Survey on the geociever programme in the Shackleton Range, the Pensacola Mountains and the Ellsworth Mountains. The four men — pilot, air mechanic and two geophysicists — who participated, completed the work successfully and returned to Rothera in early January.

MELT PROBLEMS

Meanwhile, at Rothera, work started on the final phase of the building of the new base complex (construction of a laboratory/office building, fuel tanks and a jetty) using materials which had been delivered at the end of last season. Unusually high temperatures brought melt problems (the snow ramp leading to the airstrip became a waterfall), but then the necessary concreting had been completed and construction work was able to continue. At the same time bad weather restricted flying but did not disrupt field programmes.

Faraday, which was built in 1953, is gradually being modernised, and a new generator shed and large oil tank have just been constructed. Building operations were closely inspected by Fred the Skua, who has lived at the base for at least seven summers, and is now reckoned as part of the base complement.

In each of the last six years he has arrived on more or less the same date but his year was considerably overdue. This winter team had almost given up hope of seeing him again. They decided to name their dinghy in his memory, when once more he took up residence on the balcony.

On South Georgia, excellent weather in January encouraged outside maintenance work at the main Grytviken base (including rebuilding of the slipway and at various field huts. A number of summer field workers arrived on the Bransfield in early January and carried out projects in a number of areas accessible by launch or overland from Grytviken.

As temperatures remained unseasonably low on Signy Island winter routines were continued until the beginning of December. Later on, summer programmes were resumed from various field huts around the island, and also on neighbouring Moe Island.

Biologists working from a 7m launch in Normanna Strait between Signy and Coronation islands in November were rather alarmed to find themselves escorted by three 9m minke whales which swam around and under their boat.



SERVICE IN BRITISH SURVEY

After an association of 26 years with the British Antarctic Survey one of its longest-serving members, Mr William Sloman, has retired. Known to members of the Antarctic community all over the world, Mr Sloman has been appointed development officer in the Falkland Islands, a post which he will occupy for at least two years.

Mr Sloman joined the Colonial Office in 1948, and was concerned with the Falkland Islands Dependencies Survey (as BAS was then known) from 1952 onwards. He was seconded in FIDS in 1956, and formally transferred in 1967. Until 1971 he was responsible for recruitment, training, and establishment matters, and was concerned with the scientific sections, bases, ships, and aircraft. In this capacity he made a most important contribution to the Survey's success.

In 1973 Mr Sloman became responsible for overall administration. When

all sections of BAS came together in the new headquarters in Cambridge in 1976 he was designated institute secretary. He gained first-hand experiences of the Antarctic and the BAS bases in the course of seven summer tours, and also spent several months in the Falkland Islands.

Mr Sloman will maintain close contact with his former colleagues because in the Falkland Islands he will be able to meet BAS men and ships on their way to and from the Antarctic. As a token of the warm regard in which he and his wife are held they were presented with a set of glasses engraved with the arms of the British Antarctic Territory, the names of the bases, ships, and the BAS headquarters. Dr R.M. Laws, director of the Survey, made the presentation on behalf of all Bill Sloman's colleagues, past and present.



SOVIET REPORTS

Station on Hobbs Coast to be reopened

Re-establishment of Russkaya, the seventh Soviet research station in the Antarctic, which was occupied for only two weeks in 1973, was one of two major projects planned for the 24th Soviet Antarctic Expedition last season. The other project was the completion of an airfield for heavy aircraft at Molodezhnaya, the main Soviet station, which is on the Prince Olav Coast of Enderby Land.

Russkaya, which is at Cape Burks (74deg 43m S/37deg 07min W) on the Hobbs Coast of Marie Byrd Land, was occupied from February 17 to March 2, 1973. Because of extremely difficult ice conditions in the area, the station was not occupied in later seasons. It consists of three buildings which house a solar heating system, radio equipment, stores and fuel, and accommodate a small staff.

Completion of the permanent airfield at Molodezhnaya is expected to reduce the number of Soviet ships engaged in Antarctic operations. It will also be of direct benefit to Soviet scientific programmes because scientists will be able to spend more time at bases and not rely entirely on relief by ship which now takes six weeks. Air transport will reduce the 15,000km trip from the Soviet Union to about 24 hours.

Initially the air route to Moldezhnaya will be operated by Ilyushin-18 aircraft which have been used by Aeroflot on Soviet domestic services since 1959. Later Aeroflot, which operates aircraft the helicopters for Soviet Antarctic expeditions, is expected to use heavier aircraft, possibly the four-engined jet Ilyushin-76.

A medium-range turbo-prop transport, the IL-18 has flown in Antarctic before but has not been used regularly by Soviet expeditions. The standard version can carry 110 passengers, and has a maximum payload of 13,500kg. Cruising speeds of various range from 600km to 675km an hour, and the range with maximum payload and one hour's reserve of fuel, is 3200km to 3700km.

Situated about 20km east of Molodezhnaya, the new airfield will be available for use by wheeled aircraft between December and February each season. The runway is planned to have a length of 2645km. New methods have been developed to produce a snow-ice field with a strength similar to concrete.

Engineers have built up a hard surface layer by layer, the granular snow first being consolidated by continual rolling. Then the surface is broken up with cutters by thermal machine which melts the snow with hot air blast. The mass is then compacted with vibrators. When refrozen the ice produced has the strength of concrete.

Six ships and 560 men and women took part in last season's expedition. The first contingent sailed from Leningrad towards the end of October in one of the four passenger and cargo ships used by the expedition. It was followed on November 7 by the flagship of the Soviet Antarctic fleet, Mikhail Somov, and later by the research vessels Professor Vize and Professor Zubov.

Nine main projects were included in the programme of the 24th expedition last season. Scientists investigated the following subjects: (1) Climate and circulation of the Antarctic atmosphere; (2) physical and dynamic state of the waters of the Southern Ocean; (3) morphology, dynamics, and regime of the continental ice-cap; (4) ice cover of Antarctic seas; (5) geological structure and mineral resources; (6) ionosphere physics and radio wave propagation; (7) morphology of geomagnetic field

variations and its secular changes; (8) quick variations in earth's electro-magnetic field as an indicator of processes in cosmic space; (9) acclimatisation of man in Antarctic conditions.

A meteorological service was provided by six Soviet stations — Molodezhnaya, Mirny, Vostok, Novolazarevskaya, Bellingshausen, and Leningradskaya—for ships of the Ministry of Marine fleet and the Ministry of Fisheries cruising in the Southern Ocean, and systematic data was provided for the Soviet Union's hydro-meteorological and geophysical services. A full programme of scientific observations in the fields of geophysics, glaciology, meteorology, and medicine, was carried out at all the stations.

Once again Soviet scientists worked from Druzhnaya, the summer station on the Filchner Ice Shelf, which was the base for geological and geophysical studies, and topographic and geodetic work, on the coast of the Weddell Sea, and in the Shackleton Range, Pensacola Mountains, and the Ellsworth Mountains.

TWO TRAVERSES

Glaciological observations as part of the International Antarctic Glaciological Project were made during traverses from Mirny to Komsomolskaya, and from Mirny to Pioneerskaya, and then to the point 75deg S/129deg E at Dome C. These observations were made simultaneously with work on the snow measuring project "geophysical polygon in Antarctica." Snow measurements and meteorological observations were also made during the regular supply traverse from Mirny to Vostok.

As part of the international programme Poley-South complex aerometeorological and hydrological observations were made in the Southern Ocean between Africa and Antarctica from the research vessels Professor Zubov and Professor Vize. Simultaneous hydrological, ice, and aerometeorological observations were made along the routes of the two research ships and the Mikhail Somov during their operations in Antarctic waters.

Wine for Vostok winter

New Zealand wine and fruit juice will be drunk this winter at the coldest place on earth, Vostok, the Soviet station on the Polar Plateau 1110km from McMurdo Station. They were among items presented to the 20 men of the Soviet team by Mr John Presland, the winter leader at Scott Base, when he flew to Vostok on January 22.

Mr Presland was one of 22 passengers aboard a United States Navy Hercules aircraft which made the final flight to Vostok last season. The Russians gave their visitors a traditional welcome in which vodka figured prominently, and Mr Presland expressed New Zealand appreciation when he also presented his hosts with frozen meat, chocolate, porridge, and milk and egg powder. These items were in a container packed at Scott Base.

Vostok, the most isolated of all Antarctic stations, greeted the passengers from the Hercules with a summer temperature of minus 38 deg Celsius and a 15-knot wind. In the winter of 1960 the station became the coldest place on earth when a temperature of minus 88.2 deg C was recorded. It has retained its reputation each winter since then.

When the Hercules left for McMurdo Station it has an extra passenger aboard — Robert Gregory, of Stanford University, who had completed a year at Vostok as the United States exchange scientist. His replacement, John Lio, who will share the New Zealand wine and fruit juice with his colleagues this winter, arrived on the second flight to Vostok in mid-December last year.



Women winter at Pole and Scott Base

More than 80 American and New Zealand women worked in Antarctica last summer, but only two have remained there for the winter. One is a 27-year-old doctor, Michele Eileen Raney, the first of her sex ever to winter at the Amundsen-Scott South Pole Station. The other is a New Zealand scientist, Thelma Rodgers, who is the scientific leader at Scott Base this year. She is the first woman to winter there since the base was established 22 years ago.

Dr Raney, who graduated from the University of Southern California in 1977, is the fifth American woman to winter at a United States Antarctic station. Her four predecessors all spent the winter at McMurdo Station. She has been at the Pole Station since early November last year, and will be responsible for the health of 16 men during the winter months.

Since her arrival at the Pole Dr Raney has had other duties besides the medical and dental care of male colleagues. She is manager of the station store and the post office, and during the summer has helped to unload aircraft arriving from McMurdo Station. In her spare time this winter she plans to make a digital clock from a kit set, experiment in photography and needlework, listen to music on her supply of cassettes, and enjoy New Zealand chocolate which she bought before she flew south.

Dr Raney's nearest feminine neighbour 1327km to the north will be equally busy this winter. Thirty-year-old Thelma Rodgers, who is a scientific officer at the Physics and Engineering Laboratory, Department of Scientific and Industrial Research, in Christchurch, was in charge of the Scott Base scientific programme last summer. This winter, with the help of two technicians, she has to maintain the laboratory research programme on atmospheric physics and earth sciences.

In addition to her regular laboratory work Thelma Rodgers will make daily meteorological observations outside the base in the winter darkness, and begin the long task of converting two sets of variometers (instruments used to

measure the earth's magnetic field). This equipment has not been updated since it was first installed at Scott Base for the International Geophysical Year in 1957. When the winter task is ended, and the system has been brought up to international standard, the base will have a first-class magnetic laboratory.

Thelma Rodgers, who spent two weeks at Scott Base in the summer of 1976, was well-prepared for her longer stay. When she went south in October last year she took her skis to make the most of the long hours of daylight, and also made sure she would have no shortage of things to do during the winter. In some of the parcels she posted to Scott Base in advance were such items as oil paints, potting clay, and a home brew kit for making wine.

Winter menus at Scott Base this year are likely to be livened by a touch of mint, parsley or chives because Thelma Rodgers intends to cultivate a herb garden indoors with the aid of a "grow" lamp. And her 11 male colleagues are looking forward to the products of her wine-making activities at their evening meals.

Most of the Americans wintering in Antarctica this year will have feminine company not far away. They are the 71 men at McMurdo Station. But one American is spending his winter with the Soviet team at Vostok, the coldest place on earth, deep in the heart of the continent, and a long way from the sound of a women's voice. He is Mr John Lio, the United States exchange scientist from Stanford University, who flew to Vostok on December 18 last year.

For the last two winters there has been a Soviet exchange scientist at the Pole Station. This winter the Soviet scientist will work at McMurdo Station. He is Dr Eduard Lysakov, a meteorologist, who also wintered at McMurdo Station in 1973.

Including Mr Lio, there are 106 Americans wintering in Antarctic this year. There are 71 at McMurdo Station, 17 at Pole Station, eight at Siple Station in Ellsworth Land, and nine at Palmer Station on Anvers Island, off the Antarctic Peninsula.



Scott Base was without home-grown flowers last summer. The information officer, Karen Williams, took pansy and sweet pea seeds south in October and sowed them in potting mix. Most of them came up, but like the tomato plants grown in the science laboratory during the winter of 1977, they failed to flower.

Antarctic sunlight or the lack of it did not affect the parsley planted in a window box by the maintenance officer-carpenter, Ron Garrick. Even the cigarette butts dropped into the box occasionally did not subdue its growth.

Some inherited plants provided another dash of greenery during the summer. And this winter the Scott Base team will have a horticultural interest in the cactus and herb gardens maintained by the scientific leader, Thelma Rodgers.



OBITUARY

Robert Falla's service to Antarctic research

A distinguished New Zealand ornithologist and museum director, Sir Robert Alexander Falla, whose association with Antarctica and the sub-Antarctic islands began 50 years ago, died at his home near Wellington on February 23, aged 77. He was one of the veterans of Sir Douglas Mawson's British, Australian, and New Zealand Antarctic Research Expedition of 1929-31 in which he served as assistant zoologist and ornithologist.

Robert Falla was once described as "a conservationist before conservation and ecology became household words," and his contribution to conservation in New Zealand to which he devoted much of his life, more recently as chairman of the Nature Conservation Council, won him an international reputation. But as a scientist he spent more than 30 years in research on the sub-Antarctic islands south of New Zealand, and led or organised expeditions from 1947 onwards.

In the field of Antarctic research Falla's contribution was equally outstanding. His report on Antarctic birds, written after Mawson's two voyages in Scott's Discovery, gained him a doctorate in science; and as president of the New Zealand Antarctic Society in the early 1950s he urged the Government to set up a scientific station in the Ross Dependency in time of New Zealand to take part in the work of the International Geophysical Year. Later he represented the society on the executive of the Ross Sea Committee, which was set up to organise the New Zealand section of the Commonwealth Trans-Antarctic Expedition, and was chairman of the transport and equipment sub-committee, and the sub-committee which selected the New Zealand members of the expedition. After the I.G.Y. he planned a programme of biological research for the 1958-59 and 1959-60 summers to help maintain New Zealand's presence in Antarctica.

There are several references to both men in Professor A. Grenfell Price's book on the Discovery's two voyages, "The Winning of Australian Antarctica," and their names appear on the maps of Australian Antarctic territory. Both were awarded the Polar Medal in bronze for their work, and Falla's name was given to Falla Bluff, a prominent rocky bluff at the head of a bay, about 8 km south-east of the Stanton group of islands off the coast of Mac-Robertson Land.

On his return to New Zealand Falla was appointed ornithologist and education officer at the Auckland War Memorial Museum. He was assistant director from 1935 to 1937, director of the Canterbury Museum from 1937 to 1947, and then director of the Dominion Museum, now the National Museum in Wellington, until his retirement in 1966.

Falla's long association with the sub-Antarctic islands began during the Second World War. He was able to combine scientific work and war service as a member of the secret Cape Expedition which established coast watching bases in the Auckland Islands and on Campbell Island early in 1941. Falla was in charge of the Auckland Islands stations from February, 1943, to January, 1944, and was leader of the party at Port Ross. Falla Peninsula on the main island of the group is named after him.

In 1947 Falla made the first of his many visits to the sub-Antarctic islands. He was leader of the first expedition to the Snares Islands, and the next year made surveys of the southern sealing grounds, including the Solander Islands. In 1949 he was among the many well-known scientists in the New Zealand-United States Fiordland Expedition based in Caswell and George Sounds.

One of Falla's most important expeditions was to the Antipodes and Bounty Islands, the last remaining areas in the Southern Ocean which, until 1950, had not been studied and surveyed by scientists. The party led by Falla was the first to stay a full day ashore on the barren, wind-swept Bounty Islands. In November last year Falla saw the Bounty Islands again as a member of an expedition organised by the Wildlife Service which visited the Bounty, Antipodes, Auckland, and Snares Islands.

Authority on Americans in Antarctica

An American geographer, Dr Kenneth J. Bertrand, who became an authority on United States activities in Antarctica from 1775 onwards, died in Washington on December 17 last year. He was 68.

Dr Bertrand's major work was "Americans in Antarctica—1775-1948," which was a special publication of the American Geographical Society in 1971. His scholarly and authoritative book was the

As director of the Dominion Museum Falla led or organised several expeditions to the sub-Antarctic islands in the 1960s. He led an expedition to the Auckland Islands in the 1962-63 summer, and returned with another expedition early in 1966. His last days ashore there were spent in January last year with a party concerned with better protection of the flora and fauna of the area.

Falla's outstanding services to conservation and scientific research were recognised by a knighthood in 1973. The part he played in enabling New Zealand to begin and maintain its scientific research in Antarctica was acknowledged by some of the men he helped to select for the New Zealand section of the T.A.E. when they gave his name to a 4114m peak in the Queen Alexander Range, south-west of Mt Kirkpatrick. Mount Falla was discovered on January 9, 1958, by the Southern Party.

product of more than a quarter of a century of research which began when he was invited to make a study of the history of Antarctic geographic names for the advisory committee of the United States Board on Geographic Names.

He served as chairman of the advisory committee on Antarctica names from 1962 to 1973, and was president of the Antarctic Society in 1975 and 1976.

Scott Base science technician

One of two New Zealand climbers who died in an avalanche on the Linda Glacier, Mount Cook, on January 2, was John Richard Williams, a science technician, who worked with the New Zealand Antarctic research programme in the 1966-67 season, and wintered at Scott Base in 1973. Williams, aged 32, was employed by the Applied Biochemistry Division, Department of Scientific and Industrial Research, at Palmerston North.

When Williams first went south he was a trainee technician with the Physics and Engineering Laboratory. Between December, 1967, and March, 1968, he was one of two New Zealanders who worked with the United States research programme aboard the U.S.N.S. Eltanin during her cruise in the Ross Sea. He returned to Scott Base in the 1972-73 season as a science technician in the winter team.

SUB-ANTARCTIC

Fourteen days on Bligh's islands

By Donald S. Horning

The Bounty Islands, located about 800km east of Stewart Island, have been a scientific enigma since their discovery in 1778 by Lieutenant William Bligh, of H.M.S. Bounty, who gave them the name of his ill-famed ship. Few scientists have ever landed on any of the small islands of the group and no-one has had the opportunity to study the flora and fauna of the Bounties thoroughly. But in November last year three people became the first overnight occupants there since the sealing days of the early 1800s.

Dr Jerry van Tets, Wildlife Division, CSIRO, Canberra; Mr Chris Robertson, New Zealand Wildlife Service; and myself, representing the New Zealand National Museum and the department of zoology, University of Canterbury, lived on the Bounty Islands from 7 to 20 as part of the 1978 New Zealand Wildlife Service BAAS (Bounty, Antipodes, Auckland and Snares Islands) Expedition. We conducted a variety of studies on birds, insects and marine biology.

H.M.N.Z.S. Waikato landed expedition stores by rubber boats in a strong westerly sea of Proclamation Island, a Island, a small island east of the largest island of the Bounties. Through the help of the Navy and expedition members, tents, food, water, and supplies were packed up a very slippery slope to near the top. Two wooden-floored canvas tents were erected and anchored with pitons to establish our camp.

There is no flowering vegetation on any of the 20 or so islets and islands in the Bounties group. Only a few small crustose lichens and thin sheets of green algae are found amongst the rocks. The granite slopes and crevices are filled with nesting birds — Salvin's molly mawks, Erect-crested penguins, and Fulmar prions. Bounty Islands shags, Antarctic terns, Snares Cape pigeons, and Southern skuas also breed on the island, but in small numbers.

A very small population of shags that breed only at the Bounty Islands is found on cliff ledges. Dr van Tets was able to observe the mating and nesting behaviour of this species. He also collected food samples and conducted a census of the birds. Information from this study will be useful in understanding the inter-relationships of all the species of New Zealand Sub-Antarctic shags.

We were fortunate to be on the islands when the chicks were hatching because this provided the first opportunity to observe chick-feeding. Mr Robertson also collected a number of birds for the National Museum of New Zealand. These specimens will aid morphological studies and provide a source of ectoparasitic mites and lice for further study.

BIRD CENSUS

The Bounty Islands are best known from reports of their huge numbers of mollymawks and penguins. There have been several estimates of these populations in the literature and numbers vary from thousands to millions. One of Mr Robertson's major projects was to gain an improved estimate of these birds and to determine numbers of other nesting species. Most of his work was based on Proclamation Island but rope access was provided for him to swim to nearby Tunnel and Depot Islands to conduct a bird census.

His primary interest was to observe the breeding and nesting behaviour of

the Salvin's mollymawk to supplement his comprehensive studies of New Zealand albatrosses and mollymawks. This mollymawk is only known to breed at the Bounties and the western chain of the Snares Islands, both nearly inaccessible study sites.

The Bounty Islands are the last of the New Zealand Sub-Antarctic islands to be surveyed for terrestrial invertebrates. With the limited number of habitats available to them, it is not surprising that only 12 species of amphipods, mites, spiders, and insects were known from the Bounties.

I investigated bird nest material (most often composed of dried guano, decaying feathers, and bird carcasses), rock crevices, algae-covered walls, and organic debris found under rocks, which yielded about 20 additional species of mites, springtails, beetles, and other invertebrates. Further study of these specimens will allow the investigation of the relationships and distribution of these organisms between the Bounties and other southern islands.

The marine biology programme centred on an extensive subtidal flora

and fauna survey. Diving conditions were strenuous because of the tremendous surge and cold water. Landing on small rock platforms in a heavy swell, and collecting small organisms while being swept by the surge were particularly difficult.

Nevertheless in nine dives, more than 80 samples, containing algae, colonial invertebrates, molluscs, starfish, crustaceans, and other invertebrates, were collected from rock walls, crevices, and ledges down to a depth of 43m. Dr Cameron Hay, of the New Zealand Oceanographic Institute, also collected subtidal samples at the Bounty Islands in November with the support of Navy divers from the Waikato.

All collections from the Bounty Islands as well as those from similar projects carried out on Antipodes Island later in November and December, will be sorted at or through the National Museum of New Zealand. The results of these efforts will be used to gain a better understanding of the birds, terrestrial invertebrates, and rocky shore ecology of these islands and to provide material for biogeographical studies of Sub-Antarctic islands.

Marion Island climatic studies

No new biological or geological projects were launched on Marion Island last year, and the geomagnetic, ionosphere, and climatic research programmes, were maintained as in past years. The leader of the 35th relief team was Simon Geldenhuys, who, like the other members of the meteorological team, Louis Triegaardt (senior meteorologist), Corrie Cordier, and Wouter Schutte, was new to the sub-Antarctic.

Last year's climatic programme was conducted from the new meteorological office which is situated to give an unobstructed view of the entire observation area. On May 1 computerised climate graphs were used for the first time. These are in use at most of the weather stations in South Africa.

Marion Island's ionospheric observing station was established in 1972 by the C.S.I.R. National Institute for Telecommunications Research. It is well-positioned geographically because it helps to close the break in the chain of such stations from northern Europe through Africa to Antarctica in north-south meridian observations of the ionosphere.

Information on the ionosphere for the prediction of radio propagation conditions is obtained from the ionosonde. This transmits radio pulses sweeping through the entire high frequency wave band, and receives the echoes reflected back by the various layers of the ionosphere. The heights and ionisation densities of the layers are calculated and telexed to N.I.T.R. monthly.

ONE OF BLIGH'S ISLANDS



Beacon sandstone and dolerite interlayered in the northern Britannia Range between the Hatherton and Byrd glaciers. This is the typical geology of the range where an earth sciences team from the University of Waikato worked last season. The team spent two months in the area working with the United States programme in the first intensive study of the Darwin and Byrd glaciers.

University of Waikato photo.

TOURISM

Busy summer for ships and aircraft

Aircraft and ships carried more than 4000 passengers to Antarctica last summer. Most of them flew from Australia and New Zealand on the "day trips" run by two international airlines, Qantas and Air New Zealand; the remainder visited bases in the Antarctic Peninsula area aboard two cruise ships.

More than 2850 Australians, New Zealanders, Japanese, and Americans, flew south between October and December last year. The four Air New Zealand flights by DC10 aircraft were made to the McMurdo Sound area from Auckland with landings at Christchurch, on the way home. Qantas made seven charter flights with Boeing 747B aircraft to the coasts of King George Land and as far as the French base, Dumont d'Urville in Adelie Land, and then back over the South Magnetic Pole.

Last month Qantas made five more charter flights on February 4,5,11,13,18. A Boeing 707 flight planned for February 21 was cancelled for operational reasons because the United States naval support force had completed its summer air operations.

On February 5 a Qantas 747B made the first charter flight from Perth to the Antarctic, and the first visit to an Australian Antarctic base. Casey's winter population of 25 turned out to witness the welcome but unfamiliar sight of a 747B passing overhead at a height of 609m.

Three hundred and 40 West Australians made the 11-hour flight, and raised funds for research into muscular dystrophy at the same time. Their aircraft was under the command of Captain G. Piggott. It was his first Antarctic charter flight.

Two veterans of Antarctic "day trips" were also on board. Mr John Woods, the

navigation services co-ordinator for Qantas, was on his 12th flight, and the communications officer, Mr H. Hocking, was on his 18th.

Mr Hocking arranged direct broadcasts from the aircraft to radio stations in Sydney and Perth. He also called up the radio operator at another Australian base, Davis, and a Perth housewife, Mrs Lorraine Sherwood, was able to talk to her husband, one of the winter team.

Several flights last year were made from Cape Hudson across northern Victoria Land to Cape Washington, and then back to Cape Hallett and Cape Adare. In December one flight was from Cape Hudson to the Soviet station, Leningradskaya, and back along the Oates Land coast.

Last month one 747B flew first to Leningradskaya on February 11, and then to Cape Washington, Cape Hallett, and Cape Adare. The last flight on February 18 was from Cape Hudson to Leningradskaya, then back to Dumont d'Urville and Mawson's hut in Commonwealth Bay.

All the flights except one were made by 747Bs. A Boeing 707 chartered by an Adelaide travel firm, flew from Sydney on February 13 to Dumont d'Urville and the South Magnetic Pole, and returned with it South Australian passengers to Adelaide. Other charterers included travel firms, service organisations, and an Adelaide newspaper.

Two cruise ships, the World Discoverer, operated by a Western German travel firm, and the veteran Lindblad Explorer, returned to the Antarctic Peninsula area, making calls at various bases. The World Discoverer made one cruise with 140 passengers; the Lindblad Explorer made three, each with more than 90 passengers.

and then to McMurdo Sound. She left Ushuaia, Tierra del Fuego, on January 14, and called at Port Stanley, Falkland Islands (Islas Malvinas), King George Island, Deception Island, Port Lockroy, Paradise Bay, and Palmer Station.

On her way to McMurdo Sound she encountered rough weather, and was four days behind schedule. She reached Cape Royds on February 11, but as Shackleton's hut was not open for visitors, she continued in Cape Evans, arriving there in the early hours of February 12. Passengers went ashore in the ship's Zodiac rubber boats, and were able to visit Scott's hut.

No call was made at Cape Hallett as intended originally, but the ship spent eight hours in Robertson Bay, and passengers went ashore at Cape Adare, where Borchgrevink's party was the first to winter on the Antarctic Continent in 1899. Bad weather prevented a scheduled call at Macquarie Island, and the Lindblad Explorer arrived at Campbell Island on February 14 to receive a warm welcome from the staff of the meteorological station.

Her last call before reaching Lyttelton on February 22 was the Auckland Islands where she arrived on February 19. Two landings were made on February 20, one on Enderby Island, and the other in Erebus Cover, Port Ross.

Destroyer rescues injured Australian biologist

A seriously-injured Australian biologist who fell 15m down a cliff on Macquarie Island while studying albatrosses on January 3 was transferred by helicopter to the guided-missile destroyer Hobart which made a voyage of 809 nautical miles from the sub-Antarctic to Hobart. The destroyer arrived in the early hours of January 10 and the injured man, Mr Roger Barker, aged 29, of Adelaide, was rushed to hospital.

Mr Barker suffered serious injuries to his left leg, which had to be amputated soon after his admission to hospital. He also suffered spinal injuries and extensive lacerations. His right leg was partly paralysed, and he broke his right wrist. He was not found for four hours, and was attacked by seabirds as he lay helpless on the beach after the fall, being forced to throw pebbles over his back to frighten off the birds which were attempting to attack his badly injured left leg.

Because there is no landing strip on Macquarie Island the Australian Antarctic Division called on the Royal Australian Navy for assistance. H.M.A.S. Hobart, which was undergoing a maintenance overhaul in the Garden Island dock at Sydney, was called into

service because of her range and speed. A temporary helipad was constructed on the destroyer's quarter deck so that a helicopter from the Antarctic relief ship Thala Dan, which had arrived at Macquarie Island, could pick up Mr Barker and land him on the Hobart.

After a high-speed dash from Sydney to Hobart, reached Macquarie Island on January 9 and rendezvoused with the Thala Dan in Buckles Bay on the eastern side of the island. The helicopter pilot, Mr Nigel Osborn, of Hobart, made a practice descent before he transferred Mr Barker, overcoming the handicaps of a 28-knot wind gusting from the west, and a heavy southerly swell which caused the destroyer to roll up to 15 degrees.

On the return voyage Mr Barker was resting comfortably, but later in the day his condition deteriorated, and the Hobart increased speed to arrive about 1 a.m. on January 10. Mr Barker's condition improved considerably after the operation, and later last month he was transferred to hospital in Melbourne for treatment of his spinal injuries.



French yacht sails from New Zealand to Antarctic

Three French mountaineers who braved the hazards of the Southern Ocean to climb on the Antarctic Peninsula have reached their destination after a voyage of six weeks and two days from New Zealand in the 10m aluminium yacht *Isatis*. Jean Lescure, his wife Claudine, and her brother, Jean-Marie Pare, sailed from Lyttelton on December 3, and reached Palmer Station, the United States base on Anvers Island, on January 15.

Since 1970 few yachts have ventured as far into Antarctic waters from New Zealand as the *Isatis*. One of the first was the 16m ferro-cement cutter *Awahnee*, designed and built by an American, Dr R. Griffith, which circumnavigated Antarctica in 1970-71 along much the same route followed by the *Isatis*. Dr Griffith and his wife took their son and three New Zealanders as crew on the voyage which began from Bluff.

Ice Bird which Dr David Lewis sailed single-handed from Sydney to Palmer Station in 1972-73 on the first stage of his unsuccessful attempt to circumnavigate Antarctica, is still the smallest yacht to have made a long voyage in the Southern Ocean. Dr Lewis sailed his 9.7m steel sloop 4840 nautical miles from Halfmoon Bay, Stewart Island, and reached Palmer Station in 12 weeks and two days, twice the time taken by the *Isatis*.

But with a crew of three and a powerful engine it is not surprising that the *Isatis* maintained the time-table set by Jean Lescure before he left Lyttelton. The yacht has a wind vent self-steering mechanism, extra-strength Swedish sails, and can be steered from inside under a plexiglass dome. And, of course, she was not capsized twice and dismantled like *Ice Bird*.

There have been no detailed reports of the route followed by the yachting mountaineers since their arrival at Palmer Station. They planned to sail by

way of the Antipodes Islands, and then to a point 159deg W/61deg S where a group of islands was reported in 1828. The *Awahnee* Islands, as they were named, were removed from the charts in 1952, but the crew of the *Isatis* intended to check whether they existed.

After five days at Palmer Station where they entertained the staff by showing slides of mountaineering in Nepal, the French trio sailed on January 20 for Port Lockroy, Wiencke Island. They planned to climb mountains on the Palmer Peninsula, and then sail to the South Shetlands. Then they hoped to leave the Antarctic Peninsula area late last month, and arrive in Chile this month to continue their climbing.

A Dutchman, Willy de Roos, whose 12.8 m ketch *Williwaw* was the smallest boat in history to make the Northwest Passage from east to west in 1977 was expected to arrive at Palmer Station on January 17. This was indicated in a radio message picked up while the *Williwaw* was in Drake Passage on the way from Chile.

Originally, de Roos, who sailed his ketch single-handed through the Northwest Passage, was expected to spend this winter in the Antarctic with the *Williwaw* locked in the ice. He intended to sail from Vancouver to the Chilean port of Valdivia, and then attempt the final stage of a circumnavigation of North and South America.

Apparently de Roos changed his plans. A message received at Palmer Station on January 13 said only that the *Williwaw* would not be coming to Anvers Island.



Sperm whale catches reduced

Revised 1979 catch limits for North Pacific sperm whales, one of the most contentious issues at the International Whaling Commission's 30th annual meeting last year, were set by a special meeting of the commission in Tokyo last December. The total for the eastern and western management divisions was reduced from 6444 to 3800, a cut of 41 per cent. Allowance was made for a by-catch of females of not more than 11½ per cent in the divisions. All whaling operations have to cease when the by-catch is reached.

A reduction in the Southern Hemisphere sperm whale quotas was also made by the commission in Tokyo. The new total for the 1978-79 pelagic season and the 1979 coastal season is 4875 (3820 males, 1055 females) compared with 5908 (4538 males, 1370 females) in the previous seasons. Last year's meeting in London maintained the North Atlantic quota at 685. The new North Pacific quotas now bring the total permitted sperm whale catch to 9360 compared with 13,037 in the previous seasons.

When the commission held its 29th meeting in Canberra in 1977 it made a cut of 38 per cent in quotas for the 1977-78 and 1978 seasons, reducing the total catch of all species to 17,839. Last year, although it made sei whales in the Southern Hemisphere protected stocks, and eliminated the previous quota of 771, it increased the minke whale quota in the Southern Hemisphere from 5690 to 6221. The North Pacific quota of 400 was maintained.

A lower quota was set for Bryde's whales in the North Pacific. The western stock was fixed at 454 instead of 524, and the eastern stock was also placed in the initial management category, pending a satisfactory estimate of stock size. The same provision was made for the North Atlantic,

Catch limits for the North Atlantic in the 1979 season were set at almost the same level as those that applied in 1978. They are (1978 quotas in brackets):

minke, 2552 (2555); fin, 470 (459); sperm, 685 (685); sei, 84 (84).

Sei whales are now classed as protected stocks in the Southern Hemisphere, the whole of the North Pacific, and in Nova Scotian waters. The catch limit of 84 is for the Iceland-Denmark Strait stock which is in the sustained management category.

Catch limits have been set for fin whale stocks in the waters off West Greenland, Newfoundland-Labrador, and East Greenland-Iceland. But the total catch of the East Greenland-Iceland sustained management stock must not exceed 1524 in the six years 1977 to 1982 inclusive.

A report to the I.W.C. meeting in 1977 showed that 27,484 whales were caught in the 1976-77 and 1977 seasons. Last year the whaling nations of the I.W.C. — Japan, Soviet Union, Australia, Brazil, Iceland, and Norway — killed 23,000 whales by official count. Non-member whaling countries such as Chile, North and South Korea, Peru, Portugal, Somalia, and Spain, killed an estimated 7000.

More skuas at Dome C

Dome C, the ice dome in Wilkes Land 1100km from McMurdo Station, had other visitors beside American and French scientists, and support staff, last season. In December Bebe Axelrod, the female cook at the camp, which is 800km from the coast and 3500km above sea level, reported the arrival of five South Polar skuas.

One skua was sighted on December 14, a second on December 18, and three more arrived later. Four of the birds had not been banded, but it was not possible to observe the fifth bird closely.



ANTARCTIC BOOKSHELF

Men on Ice in Antarctica. By John Bechervaise.

Lothian Publishing Company Pty. Ltd, Melbourne. Australian Life Series. 104 pp with index. Black and white illustrations, colour, black and white illustrations, maps, \$NZ5.45 (paperback)

Australians in the Frozen South. Living and working in Antarctica. By Elizabeth Chipman.

Thomas Nelson Australia Pty. Ltd, Melbourne. 90 pp with index. Illustrations, colour, black and white. \$NZ12.45.

Had these two authors joined forces, one to write the text and the other to provide the illustrations and choose the publisher, a spectacular book might have emerged on Australia's involvement in Antarctica. As it is, we have two books, both published in the same year, on fundamentally the same topic; one a small paperback, economically printed but with an absorbing text, the other, larger and more lavishly produced with some fine photographs, but rather an inferior text.

John Bechervaise's book "Men on Ice in Antarctica" was written as part of an "Australian Life Series" and is aimed at a predominantly Australian market. Bechervaise has taken pains to describe the scientific work being undertaken in the Antarctic under the Australian flag, and, as a former ANARE leader at Mawson, is well-qualified to do so. Wisely he has left the well-trodden synopsis of Antarctic history and general aspects of the continent to other authors. He has written an absorbing book that, despite its scientific sections, can successfully conjure up the atmosphere of isolation at the three Australian bases, Casey, Mawson and Davis.

From a New Zealand point of view, a scientific expedition to Antarctica means a flight of five to 10 hours from Christchurch to Scott Base with a cultural and climatic shock at the end. Bechervaise's book gives the impression that the ANARE teams with their two to three week battle through stormy seas and pack ice in Danish ships, followed by an enforced year-long residence on the ice with no prospect of forgotten equipment or mail being brought down on the

next flight, are perhaps more closely linked to the "heroic" past than ever are the NZARP and USARP teams. In this respect the book an absorbing study is how other Antarcticans live.

Nor is this slim volume, with its liberal scatter of black and white photographs of ice-bound Australians in action, a dry summary of scientific facts. Rather it is an interesting mixture of scientific description and romantic observations.

By using his own experience and observations, such as describing the way in which the base staff gaze out to sea for the relief ship days before the ship could possibly appear on the horizon, Bechervaise helps to make the continent more real to his readers.

Also Bechervaise maps objectively the international scene and underlines the politics behind the scientific work as well as the importance of the Antarctic Treaty, the articles of which are listed briefly at the back of the book. He deals not only with the Australian bases but also comments on the design of other stations so that some integration is made with the rest of the continent.

In contrast, Elizabeth Chipman's book "Australians in the Frozen South" is almost luxurious; hardbacked, spaciously and well-laid out with some striking colour and black and white photographs. But regrettably this is the best aspect of the book.

Chipman's style is dry and factual and lacks the human element that might have made her book outstanding. Possibly this is because her personal observations were limited to a brief visit to Casey Station which gave her little scope

except for factual information, which she provides quite adequately. Her visits to Macquarie Island have also stood her in good stead.

This book is worth buying for the photographs alone, but it does not say much about Antarctica — beyond how it generally affects the Australian team.

And a book about the whole of Antarctic Territory should have at least a couple of illustrations showing Mawson and Davis Stations. As it is, only Casey graces the pages.

Margaret Bradshaw
Geologist, Canterbury Museum

Historic Document Found Again

A document and other artefacts left in Antarctica by the Australian polar explorer, Sir Hubert Wilkins in 1939 have been rediscovered after 20 years by a party from Davis. They were first found in 1957, but attempts to find them since then have been unsuccessful, probably because of heavy snow cover.

To reach the site the party from Davis travelled on motor toboggans over sea ice 4m thick. The document and other artefacts they rediscovered were left by Sir Hubert Wilkins when he went ashore in the Vestfold Hills area from the Wyatt Earp, the ship used by Lincoln Ellsworth for his 1938-39 expedition on which he flew to 72deg S/79deg E over an area he named American Highland.

The find was a brown paper parcel which contained two enamel containers, probably beakers, pushed end to end. Inside the parcel was an Australian flag in which was wrapped a copy of "Walkabout" magazine dated October, 1938. Between the pages of the magazine was a typewritten note signed by Sir Hubert. It referred to the Order-in-Council of February 7, 1933, which established the Australian Antarctic Territory, and recorded Sir Hubert's landings at several places in the vicinity.

A cairn on Walkabout Rocks marked the location of the parcel. The rocks are about 33km north-east of Davis, and were named for the 1957 discovery of the cairn and the presence of the magazine.

Mr Eric King, of South Perth, led the party which rediscovered the artefacts. His colleagues were Messrs Neville Alexander, of Sebastapol, Victoria, Colin Christiansen, of Moorebank, New South Wales, and Dr Mark Podkolinski, of Corsham, United Kingdom. Poor light

prevented them from photographing their find, and the artefacts were taken back to Davis to be photographed.

To ensure the security of this historic record a copper container was made for the artefacts, and later they were returned to their original location. A larger cairn was constructed to mark the position.

Record of "Heroic Age"

Between 1910 and 1916 two men, Herbert G. Ponting and Frank Hurley, gave the world a photographic record of the last three expeditions of the "Heroic Age" of Antarctic exploration led by Scott, Shackleton, and Mawson. Ponting was the photographer with Scott's last expedition, Hurley went south twice, first with Mawson, and then with Shackleton.

Many of the photographs taken by the two men have appeared in their own books, in the official accounts of the expeditions, and in the books written about the three explorers in the last 65 years. Now 69 of their photographs, many of which have not been published before, have been brought together in a book which will be published by Macmillans later this year.

Frank Hurley was an Australian, and appropriately the book has been produced in Australia. The monochrome photographs in the 120-page book, published at \$NZ13.95, have been selected by Jennie Beddington, curator of photographs, National Gallery of Victoria. Sir Vivian Fuchs has written an introductory essay, and the foreword is by Lennard Bickel, author of "This Accursed Land."

Appeal to preserve Discovery

H.M.S. Discovery, the little barque-rigged wooden ship which took Scott's first expedition to the Antarctic in 1901, will be repaired and preserved in a collection of historic ships which the Maritime Trust plans to assemble in the East Basin of St Katharine Dock, in the heart of London. Deterioration of her wooden hull, which would cost more than \$800,000 to repair, is now believed to be not as bad as earlier reports suggested, and the Maritime Trust is confident that the ship can be preserved for many years.

Next month the Admiralty will transfer ownership of the Discovery from the Ministry of Defence to the Maritime Trust because it is unable to maintain the ship any longer or meet the cost of a major refit to arrest the deterioration of the inner hull caused by a fungus growth. The Maritime Trust was founded in 1969 with the aim of restoring, maintaining, and exhibiting historically and technically significant British vessels of all types, together with maritime equipment.

As soon as possible the Maritime Trust, which plans to assemble its historic ship collection in association with St Katharine-by-the-Tower Ltd, will arrange with the National Maritime Museum at Greenwich to establish a museum of exploration and discovery in the Discovery. There are already a number of relics of Scott's expeditions on display in the museum, and a small exhibition of the work of the British Antarctic Survey.

First priority will be given to establishing the extent of deterioration in the Discovery's timber. This is a difficult task because much of the hull is more than 60cm thick, built up in several layers of timber. Ideally a survey should be done in dry dock but, on this occasion, it will have to be carried out with the ship afloat in her present berth off the Thames Embankment where she has been for more than 40 years. Superficial inspection indicates that her condition may not be as bad as press reports have suggested.

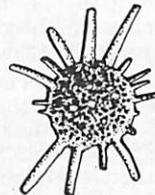
A public appeal for funds to preserve the Discovery was launched by the Maritime Trust in October. The Greater London Council has given about \$8000, the proceeds of its first lottery to the Discovery Fund, and also has promised to give \$2 to match every \$8 raised by public subscription up to a limit of \$200,000. Money already contributed by well-wishers has been lodged with the Maritime Trust's bank, marked Discovery Fund.

Any donations towards the Discovery's preservation will be gratefully accepted by the Maritime Trust. Its headquarters are at 16 Ebury Street, London, SW1W 0LH.

West Germany's Base

West Germany's first permanent Antarctic research base will not be established until the 1980-81 summer. Originally the new station was to have been set up on the Filchner Ice Shelf next summer.

Extension of the planning time is necessary because the Alfred Wegener Polar Research Institute, which will be responsible for the research programmes, has yet to be established in permanent quarters. Also a \$50m research and supply ship, which will support West German Antarctic operations, is still under construction.



ANTARCTIC

is published quarterly in March, June, September, and December. It is the only periodical in the world which gives regular up-to-date news of the Antarctic activities of all the nations at work in the far south. It has a worldwide circulation.

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.

