ANTARCTIC

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NEW ZEALAND ANTARCTIC SOCIETY (INC)

A DOG TEAM ON THE JOB TEN MILES WEST OF MAWSON, THE MAIN AUSTRALIAN BASE IN MAC-ROBERTSON LAND. MAWSON IS THE ONLY AUSTRALIAN STATION WHICH STILL KEEPS SLEDGING TEAMS. EACH YEAR DOG TRIPS ARE MADE TO CHECK ON EMPEROR PENGUIN POPULATIONS AT THE NEARBY ROOKERIES AT AUSTER, TAYLOR, AND FOLD ISLAND.

Australian Antarctic Division
Photo: Max Cutcliffe

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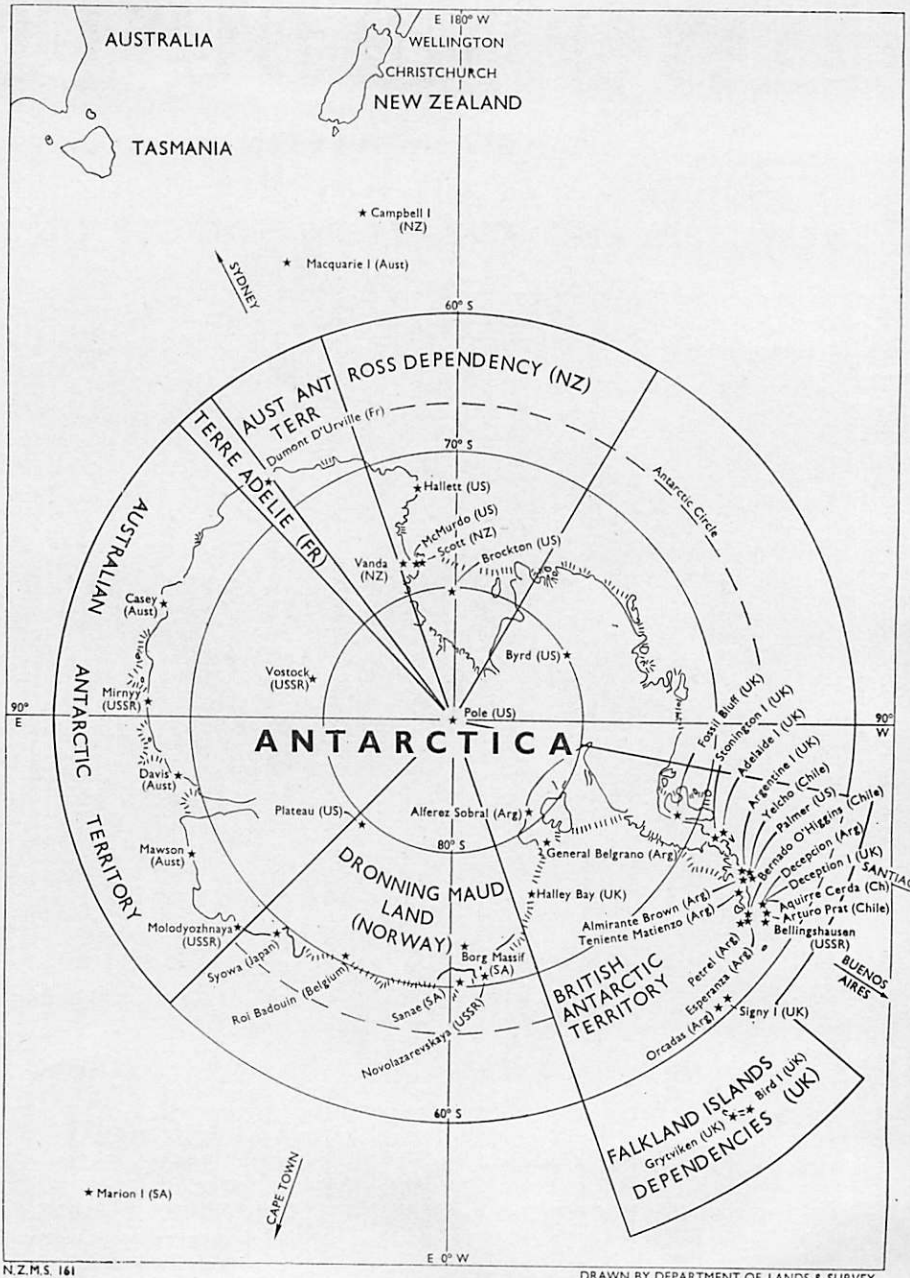

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CONTENTS

Americans at McMurdo Station and New Zealanders at Scott Base can now watch television; Russians at Molodezhnya have a computer; women in Antarctic are no novelty; and civilians are doing tasks once performed by the United States Navy in support of science. Since the International Geophysical Year there have been many changes in the pattern of Antarctic research.

But technological and social changes have not affected the traditional celebration of Christmas. Once again men of ten nations will celebrate in the same way as their predecessors. To all of them "Antarctic" extends warm wishes for a Merry Christmas.

SCOTT BASE REBUILDING PLANS IN PREPARATION

Scott Base, New Zealand's main scientific station in the Antarctic since 1957, may be rebuilt on its present site at Pram Point, Ross Island, if the Government gives approval. Plans are in preparation for rebuilding the base in stages, probably over the next five years. This month an architect and two building services officers from the Ministry of Works spent two weeks studying the base.

Earlier, Mr R. B. Thomson, superintendent of the Antarctic Division, Department of Scientific and Industrial Research, said it was hoped that the first stage of rebuilding would be under way next year. Proposals were to increase the size of the base by about 50 per cent, and one of the priorities was a laboratory for work in the summer.

Scott Base is the last of the Antarctic stations built for the International Geophysical Year that is still in existence. It was established in January, 1957, and since then all the other nations have rebuilt their bases completely or substantially. The Ministry of Works designed the base, which cost $39,663 10s 4d—nobody has ever explained the departmental fourpence—and has been praised by Antarctic experts as a model base for a small expedition.

Plans for the new base follow the basic plan of the original, with a covered connecting way between the buildings. But Mr Thomson said that better accommodation and facilities were proposed, and there would be changes in design and the type of materials to be used.

The designers of the proposed new base hope to include facilities for women scientists who wish to work in the Antarctic during the winter. New Zealand has three women scientists in the field this summer; in five years there could be women wintering at Scott Base.

Mr Thomson said that the base was being planned to provide the right sort of facilities and accommodation for use over the next 25 years at least. When it was first built the base was intended to house about 20 men. This summer more than 120 New Zealanders would be in the Antarctic research team.

The needs today are much greater than they were when Scott Base was first occupied. Today, according to Mr Thomson, scientists cannot be expected to work from a little box or a tent. They use far more sophisticated and complex equipment, and without better facilities at Scott Base New Zealand cannot attract for much longer the right sort of scientist to carry out its scientific programme in the Antarctic.

Work on the site for Scott Base at Pram Point began on January 9, 1957, and the New Zealand flag was formally raised on January 20, the flagpole used for the ceremony having come from Hut Point where it had been used by Scott's first expedition from 1902 to 1904. The first building was erected on the site on January 14.

The first inhabitants of Scott Base moved in on the night of January 11, but they had to occupy two of the six tents pitched on the beach near the site. They were J. H. Miller, deputy-leader of the New Zealand party, R. M. Heke, of the Ministry of Works, who was then foreman of the construction unit, and J. H. Hoffman, a drilling expert from the Geophysics Division, Department of Scientific and Industrial Research, whose expert knowledge was needed for the task of drilling nearly 200 holes to anchor the aerial and buildings of Scott Base.

Mr Miller is now chairman of the Ross Dependency Research Committee, and Mr Heke, a former president of the Canterbury branch of the New Zealand Antarctic Society, is now with the Ministry of Works in Wellington. Mr Miller flew south this month to visit Scott Base and Vanda Station; Mr Hoffman has been in the Antarctic since early September as supervisor of the New Zealand drilling team engaged in the international Dry Valley Drilling Project.

New Zealand drillers start work in Dry Valley region

Drilling on the Antarctic Continent, another stage in the Dry Valley Drilling Project, the major three-year programme developed by United States, New Zealand, and Japanese scientists, began in the Wright Valley, 80 miles west of Ross Island, early last month. New Zealand drillers, working on ice 12ft thick in the middle of Lake Vanda, started their sensitive probe 200ft into the lake floor. Several weeks earlier, on Ross Island, the drilling crew finished boring the deepest hole—1250ft—drilled on land in Antarctica.

Cores from the hole at Lake Vanda will help scientists to account for the lake's unusual thermal and chemical characteristics, and its origin, and to interpret more correctly the geological history of the dry valley area. Although the lake is covered usually with 12ft to 15ft of ice, its bottom water temperature has been measured at nearly 80deg Fahrenheit. Also water at the bottom is saltier than that near the surface.

During the drilling, which began on November 13, special techniques and safety measures were employed to prevent pollution of the lake. After the drill penetrated the surface ice, an outer casing was lowered to the lake floor to trap any mud, sediment or salted water that might leak out of the drill hole. At the same time a pile-driving technique was used to penetrate the lake floor instead of the conventional rotary cutting method.

In the first week the drillers reached the lake floor without disturbing the clarity of the water, and obtained nearly 10ft of sediment core. But drilling had to stop temporarily shortly afterwards because the outer casing around the drill broke off 70ft above the lake floor. New sections of casing were flown to the site later.

Environmental monitoring of the drilling project was conducted by Dr C. Hendy, of the University of Waikato He is one of a party of seven from the university's Antarctic research unit, studying the survival of organisms in the dry valley lakes in winter, and the lake sediments.

When they have finished at Lake Vanda, the New Zealand drillers will move to another unusual body of water in the Wright Valley—Don Juan Pond—where the water is so salty that it does not freeze even at temperatures of minus 70deg Fahrenheit. A hole will be drilled on the west side of the pond through 180ft of sediment into crystalline rock.

Finally the drilling crew will work at Lake Vida in the Victoria Valley. Here a hole will also be drilled through sediment into crystalline rock at the west end near the shoreline.

In preparation for the Lake Vanda operation three United States Navy tracked cargo carriers took more than eight tons of equipment, including the drilling rig, and food and supplies for the drilling crew, 70 miles across the sea ice of McMurdo Sound to Marble Point. The round trip took 21 hours. Later the men and their equipment were flown by helicopter to Lake Vanda.

The hole drilled on Ross Island near the earth sciences laboratory at McMurdo Station was to have been taken to 3000ft but drilling had to be stopped so the rig could be moved to Lake Vanda. Next season another attempt will be made to penetrate the permafrost and deepen the hole.

Working with United States and Japanese scientists, the New Zealand team secured about 1150ft of core, all of it in permafrost. Preliminary analysis of samples at McMurdo Station indicate that rock in them is at least 650,000 years old.

Dr S. B. Treves, of the geology department, University of Kansas, who is the drilling project scientist, says that little ice was found in the deepest parts of the hole. This suggests that the permafrost layer might have been broken through without too much more drilling, and bedrock reached.

In the course of the drilling about 8000 gallons of lubricating fluid were lost. The discovery was made when the bore hole had reached 930ft. But there had been nothing in the core material to that stage to indicate a fracture anywhere.

As the drill was in volcanic permafrost, it was concluded that the fluid must be escaping through several hundred feet of porous volcanic material. The drillers decided to fill the deep hole with water which quickly froze.

Then the drillers began drilling through the ice-filled hole. Their improvisation worked—the fluid did not escape this time.

Lake Vanda heat findings

Preliminary temperature measurements from core samples of the sediment in Lake Vanda obtained by drilling last month indicate that the lake in the Wright Valley is heated by solar energy rather than geothermally heated, a question which scientists in the Antarctic have argued for the last 15 years. Thermocouples have been placed in the drill hole to monitor temperatures over a long period and test the initial findings. Geologists working with the Dry Valley Drilling Project also discovered fossils, tentatively identified as marine diatoms, in sections of the cone samples.

Drilling at Lake Vanda was abandoned in the last week of November after 12 days work when the New Zealand drilling team struck what was apparently the granite bedrock below the bottom of the lake. The drill rig was moved to the next site in the project at Don Juan Pond, 10 miles from Lake Vanda, and drilling began early this month.

Originally it was planned to bore 200ft into the lake bottom to remove a series of core samples from the sediment. But bedrock was reached after only 41ft of core samples had been collected. When the granite was struck at 40ft, it was believed to be a boulder. When they had drilled 16ft into it, however, geologists and scientists became convinced it was bedrock.

Exact identification of the fossils found in the lake sediment will be made by micro-paleontologists in the United States and New Zealand. Dr S. B. Trevas, of the geology department, University of Nebraska, who is the project scientist, says that if the specimens are, in fact, marine fossils, it means that the core samples contain the geological history of the Wright Valley from the time it was a fiord with access to the sea to its present state as a polar desert. ("Antarctic," September, 1972, Page 253).

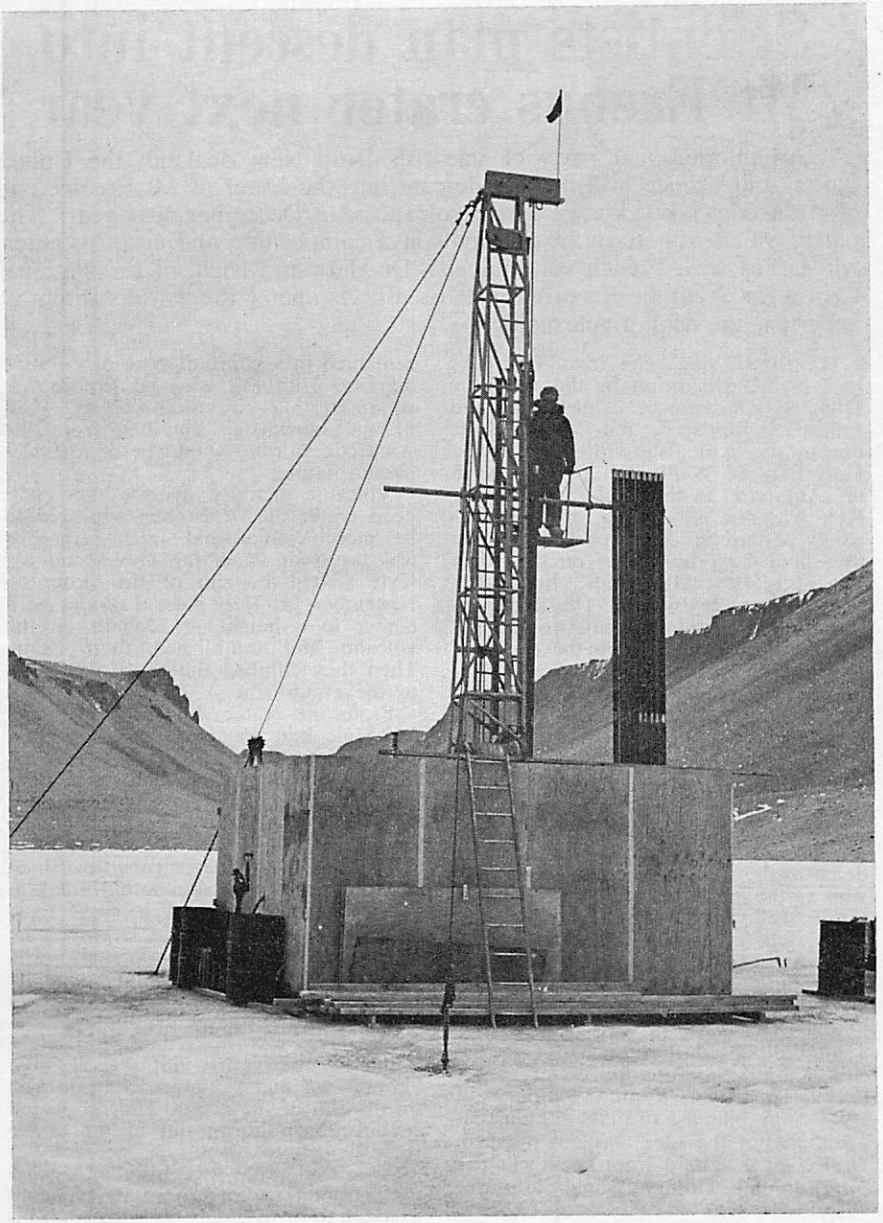
Men poisoned in tent

Two members of the Victoria University of Wellington expedition camped on Shapeless Mountain, 150 miles from Scott Base, on the edge of the Polar Plateau, suffered carbon monoxide poisoning early on the morning of November 27. They were on top of the 9000ft mountain in their tent melting ice for water on their kerosene-fired stove when they were overcome.

The field leader of the party, Ken Blackwood, and a geologist, Russell Plume, were later taken by helicopter to the United States Navy hospital at McMurdo Station where they were treated and discharged. They have since returned to Shapeless Mountain.

Ken Blackwood said later that all he remembered was a passage in the book he was reading, and feeling intoxicated and ill. He crawled out of the tent and yelled to Russell Plume to get out or he would drag him out. When they were both outside they were crying and stumbling about.

The commotion woke the scientific leader, Mrs Janet Crump, and another geologist, Graham Rowe. They dressed the men in protective clothing, walked them up and down for an hour to clear the poison from their systems, and treated them for shock. Then Mrs Crump radioed Scott Base for help, and a helicopter was sent.



Drilling rig on the ice of Lake Vanda in the Wright Valley.

Antarctic Division,
D.S.I.R. Photo.

Scientists plan descent into Mt Erebus crater next year

An international party of scientists from New Zealand, the United States, and France, will make a descent into the crater of Mt Erebus, one of Antarctica's two known active volcanoes, in December next year. The party, which will study the volcano's lava composition and eruptive gases, will be led by a French vulcanologist, Dr Haroun Tazieff, of the National Centre for Scientific Research in Paris, who is one of the world's foremost experts in the field of vulcanology.

Dr Tazieff has been invited to take part in the expedition by the Antarctic Division, Department of Scientific and Industrial Research, and Mr P. Kyle, one of the geologists with the Victoria University of Wellington party now in the Antarctic. In the 1972-73 season Mr Kyle was one of six men of New Zealand's Antarctic Research Programme who landed by helicopter on the north side of 12,450ft Mt Erebus, about 450ft below its crater summit. The party encountered bad weather, but two successful descents were made in the crater of the volcano to take gas samples. ("Antarctic," September, 1973, Pages 401-402).

Dr Tazieff returned from the Antarctic early this month after making a reconnaissance of the valcano to determine the techniques to be employed next year. He was taken to the crater by Dr S. B. Treves, of the geology department, University of Nebraska, who is the project scientist for the dry valley drilling project, and Mr Kyle, who is the site ecologist. They and a field assistant, Mr P. Cooper, studied the crater floor of Mt Erebus from the rim early last month.

When he was in Christchurch Dr Tazieff disclosed that he had first discussed a descent into the crater of Mt Erebus with Sir Edmund Hillary in 1959. They planned to make the descent together, but the idea was not pursued. Dr Tazieff said he did not know whether Sir Edmund Hillary would join the party next year.

Dr Tazieff said that most of the several thousand potential and active volcanoes around the world slept for years and for centuries. Then they awoke and erupted for a few days or months before going back to sleep. Only a few remained in a constant state of eruptive activity. That was why Mt Erebus was so interesting to vulcanologists. Most of the knowledge obtained from the Antarctic valcano would be of a fundamental nature.

Volcanic activity within the 800ft deep crater of Mt Erebus appeared to be more violent and intense than it was last year when Dr Treves and Mr Kyle visited the rim of the crater on November 11. They were taken by helicopter to a height of 12,000ft on the volcano and established their camp. Then they climbed the remaining 450ft to the crater rim.

From the crater rim Dr Treves and Mr Kyle had an unusually clear view of the crater floor. They saw bright red molten lava welling up along a 30ft to 40ft wide fissure, and flowing into a lava lake in the north-west corner of the crater.

The lake showed large ropy flow lines, and occasionally its skin would break to reveal the glowing lava below. Each time the lava surged up a large volume of gas and steam was released. The 1½min pulsations were accompanied by loud hissing, and about every 5min there was an unusually large eruption.

No lava was ejected during eight hours of observation but several large "bombs" of glassy pumice were noticed on the rim of the crater. They appeared to have been blown out of the crater recently.

A seismograph was installed in an underground ice cavern in the volcano so its activity could be monitored from Scott Base. But the instrument failed to work, and Mr Kyle believes that a pebble blown by the wind hit the seismograph during installation, and damaged a magnet inside. There are no replacement parts at Scott Base.

Plaques will mark historic sites in Ross Dependency

Five sets of bronze plaques marking historic sites in Antarctica will be placed in position in the Ross Dependency this summer by New Zealanders from Scott Base. One set will mark the first known grave in the Antarctic, that of Nicolai Hanson, the Norwegian zoologist who died at Cape Adare while serving with Borchgrevink's Southern Cross Expedition (1899-1900).

Each set of four comprises 18in by 9in plaques with the same inscription repeated in English, Spanish, French and Russian. There are 43 sites and buildings in Antarctica approved as historic monuments by the seventh consultative meeting of the Antarctic Treaty nations. At the sixth meeting it was recommended that all historic monuments in the Antarctic should be preserved and protected and marked with notices.

New Zealand is responsible for the whole of the Ross Dependency which has been the most visited region in the exploration of the Antarctic. A list of ten particular historic areas where notices should be placed was included in the 43 approved at the Antarctic Treaty meeting in Wellington last year.

In addition to Hanson's grave on Cape Adare itself, Borchgrevink's hut on Ridley Beach will be marked. It was built in February, 1899. Plaques will be placed on the remains of the rock shelter at Inexpressible Island, Terra Nova Bay, built in March, 1912, by the northern party of Scott's last expedition led by Lieutenant Victor Campbell. The party spent the winter of 1912 in this shelter and a nearby ice cave.

On Ross Island plaques will be placed at Cape Evans and Cape Crozier. At Cape Evans the cross on Wind Vane Hill will be marked. It was erected by the Ross Sea Shore party of Shackleton's Trans-Antarctic Expedition (1914-1916) in memory of Captain A. L. A. Mackintosh, V. G. Hayward, and the Rev. A. P. Spencer-Smith, who died in 1916. The remaining men were rescued on January 10, 1917.

While the Aurora was at Cape Evans a search was made for traces of Mackintosh and Hayward. During this period A. K. Jack and E. Wild built a massive cross of what timber they could lay their hands on, and anchored it with slabs of kenyte rock on the crest of Wind Vane Hill.

The fifth set of plaques will mark the stone hut at Cape Crozier built by Wilson, Bowers, and Cherry-Garrard in July, 1911, during the winter journey to collect Emperor penguin eggs. The journey is part of Antarctic history as "the worst journey in the world."

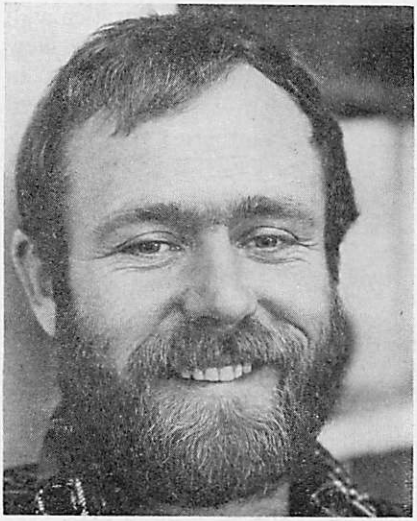
R.N.Z.A.F. SUPPORT FLIGHTS

Royal New Zealand Air Force Hercules aircraft of No. 40 Squadron began flights from Christchurch to McMurdo Station this month in support of the United States airlift of men and supplies to the Antarctic. Four helicopter pilots and two crewmen of No. 3 Squadron will spend the summer flying with the United States Navy's VXE6 Squadron on Antarctic operations.

Ten flights will be made this season by the R.N.Z.A.F., the last on January 9. The aircraft will also carry material for the New Zealanders at Scott Base.

Flight Lieutenant T. D. Mollard, Flying Officer G. L. Claxton, and Sergeant M. D. Burke, of No. 3 Squadron, left on November 20 to spend a month with the Americans. They will be followed by Flying Officers B. W. Payne and F. H. Parker, and Sergeant P. H. Mason, who will also spend a month in the Antarctic.

Vanda Station Leader



Leader at Vanda Station, New Zealand's only base on the Antarctic Continent, this season is a 31-year-old Englishman, Ian Curphey, of Greymouth. He was with the British Antarctic Survey from 1968 to 1970, and took part in both summer and winter programmes, including a sledge journey from Stonington Island, in Marguerite Bay, to the B.A.S. advance base at Fossil Bluff,

Before his first trip to the Antartic Mr Curphey served as a junior engineer in the Merchant Navy. He climbed in Britain and the Swiss Alps, and took part in three British speleological (cave exploring) expeditions to France and Morocco. Then he had his first involvement with the British Antarctic Survey at sea instead of on land. From 1966 to 1968 he was third engineering officer aboard the Royal Research Ship Shackleton, operating in the waters round the Antarctic Peninsula.

In 1969 Mr Curphey led an expedition to Iceland. His party crossed the Vatnajokulic ice cap on foot. He joined the B.A.S. in the same year as a field assistant and dog team driver.

Law and order on ice

Every Antarctic summer the Ross Dependency—the sector of the continent claimed by New Zealand—is dignified by the appointment of a justice of the peace and a coroner. This season the dependency has also the services of a police constable, but not in his official capacity.

Thirty-one-year-old Constable M. Tunnicliffe, an Auckland suburban policeman, will not have to patrol a beat round Scott Base. He is working as a field assistant for the New Zealand Geological Survey in the Koettlitz Glacier region, and will be in the Antarctic for the summer.

The leader at Scott Base, Mr H. W. E. Jones, is the man who could, if necessary, call on the services of Constable Tunnicliffe. The Governor-General (Sir Denis Blundell), as Governor of the Ross Dependency, has appointed him a justice of the peace and coroner. As an officer of the government of the dependency, he has been given all the powers and authorities which justices and coroners can exercise in New Zealand.

Mr Jones has had to wear another hat already this season. He has been an examination supervisor for a University of Canterbury student, 25-year-old Mr Peter Fowler, who is one of ten New Zealand drillers working on the Dry Valley Drilling Project. Mr Fowler has had to study for his final examinations, and complete papers in mathematics and physics for his bachelor of science degree under more demanding conditions than any of his fellow students will ever experience.

For six weeks Mr Fowler had to return to his room at Scott Base to study after working eight hours a day in sub-zero temperatures and high winds on a drill rig near McMurdo Station. He sat his examinations, and then it was back to the rig.

B.A.S. ACTIVITIES

Long-term study of reindeer herds on South Georgia

Two major projects in the British Antarctic Survey programme for 1973-74 will be a long-term population and ecology study of the reindeer herds on South Georgia, which have increased to about 2500 since the original 18 animals were introduced in 1909 and 1925, and an investigation of some of the biologically interesting lakes which form in George VI Sound in the summer. During the season a reconnaissance will be made of an area on Wiencke Island, in the Palmer Archipelago, for an emergency landing strip which could be a possible alternative to the strip on nearby Anvers Island.

Some of the 61 new recruits for the seven B.A.S. bases will help to transfer heavy equipment from the old base at Halley Bay to the new base, which has been rebuilt in steel tubes erected last summer. Parts of the new base are already occupied, and it should be fully operational at the end of next month. When the Royal Research Ship Bransfield arrives Halley Bay will see its first woman visitor since the base was established in 1956. She is Mrs Petronella Woodfield, wife of the ship's master, Captain Tom Woodfield.

For the next two years three men, a veterinarian, a botanist, and a biological assistant, will study the reindeer herds on South Georgia, and their effect on the ecology. The team will advise if any management of the herds is necessary.

Initial counts of the reindeer have been made at Stromness as part of the long-term study. There are now three herds probably totalling 2500 animals, which are seriously affecting the vegetation on the island. The animals were introduced by Norwegian whalers in two batches in 1909 and 1925.

Weddell seal tagging has been resumed at Signy Island in the South Orkneys. In October marine biologists made a record number of dives—30 in all, and were submerged for 700 minutes. On South Georgia trawling has continued from the new 25ft steel launch, and divers set a local record by working to a depth of 95ft.

Since September surveyors, geologists and geophysicists have been working in the south of the Graham Land plateau, and on the Palmer Land plateau near Mt Andrew Jackson. Geophysicists have also been working on the east coast overlooking Mobiloil Inlet. Another field party travelled north early in the season to re-establish a route down the very steep slopes from the plateau to northern Marguerite Bay, in preparation for summer field work.

HIGH WINDS

Surveyors also continued work on the plateau north of the base, but were held up for a time in September by a 90-knot wind. The sea ice in Marguerite Bay was removed by this and subsequent winds but has re-formed immediately.

Winds temporarily removed the ice from the vicinity of the Argentine Islands in August, and, at the same time, blew down the ionosonde mast. It took seven days' hard labour in bad weather to re-erect it, and no sooner was it up again than a radiosonde brought the aerials down by landing on them while they were transmitting at full power

Two men from Fossil Bluff visited the field hut at Spartan Glacier in August, and glaciologists resumed work there in September. A second larger field hut will be flown in this season.

A new venture in George VI Sound is the study of some of the lakes which form there during the summer. These are biologically interesting, especially as fresh water overlies salt water. Two limnologists will investigate the lakes this season. As part of their programme they will be diving, using wet suits. Another tide gauge has been installed in the sound.

Geologists will continue last year's very successful work on Alexander Island.

AIR OPERATIONS

When the survey's two Twin Otter aircraft, flown south from Canada on October 6, reached Adelaide Island on October 16, they began immediately the ferrying of supplies to Fossil Bluff and to field parties. Field work from Stonington Island and Fossil Bluff began in early September, and parties are now active in a number of areas.

One aircraft has been fitted with a geometrics proton magnetometer, and has already made a series of reconnaissance flights. A series of magnetometer traverses will be carried out during the summer by two geophysicists who travelled south in the Royal Research Ship John Biscoe.

Since the Deception Island eruptions of 1967 and 1969, and the consequent closure of the British base in Whalers Bay, an emergency landing strip has been manned on Anvers Island during the summer. This is not satisfactory as it is up on the ice piedmont and can be reached only by negotiating a steep ice slope and a maze of thinly bridged crevasses.

Two men, therefore, will be landed on nearby Wiencke Island, about a mile from Port Lockroy, to reconnoitre the area as a possible alternative site for the airstrip. This area is easily accessible by sea, and its use would enable supplies to be flown south if at any time in the future the condition of the sea ice should deteriorate again. There was a series of very bad ice years in the late 1950's and early 1960's when it was very difficult to relieve the Marguerite Bay bases by sea. It is not impossible that such conditions might recur.

All the main B.A.S. bases except Halley Bay will be visited during the season by the Royal Research Ship John Biscoe. She was the first to sail from Southampton on October 2; the R.R.S. Bransfield followed on October 31.

The John Biscoe, which arrived at the Falkland Islands at the beginning of last month, will spend the early part of the season supporting scientific field parties on South Georgia and the South Orkney Islands. She will spend a considerable time around the South Orkney Islands continuing the marine biological programme. Quantities of fish will be collected and deep frozen for assessment by food technologists in Britain.

After Christmas the John Biscoe will proceed to the Antarctic Peninsula where she will relieve the three west coast bases—Argentine Islands, Adelaide Island, and Stonington Island. Fossil Bluff advance base will be re-supplied, as usual, by air from Adelaide Island. At the end of February the ship will carry out a hydrographic survey in Marguerite Bay with H.M.S. Endurance.

AMERICAN CALLS

Before proceeding south the Bransfield called at Davisville, Rhode Island, and Norfolk, Virginia, where she picked up stores for the American Palmer Station, on Anvers Island. This in some measure reciprocated the generous help given to the survey over the years by the Americans. When the B.A.S. hut on Anvers Island was burnt down in an accident at the beginning of 1972 the Americans provided accommodation at their station for summer field parties manning the emergency landing strip.

Dr Richard Laws, the new director, will join the Bransfield early in the New Year. He will visit all the bases to carry out a comprehensive review of B.A.S. activities. It is probable that a B.B.C. television team from the Natural History Unit at Bristol will join the ship also in the New Year.

When the Bransfield left Southampton, the master's wife, Mrs Petronella Woodfield, joined the new wave in the Antarctic of more women visitors and workers. She will be the first woman

Mr and Mrs Trevor Hooley and their daughter at Port Lockroy, on Wiencke Island (64deg 49min S) on February 16, 1944. They travelled there on board the Royal Mail Ship Fitzroy, chartered from the Falkland Islands Company to carry stores for the establishment of the first British bases on the Antarctic Peninsula by Operation Tabarin, the secret war-time forerunner of the British Antarctic Survey.
—B.A.S. Photo.

to visit all the main B.A.S. bases, and probably will be the first to cross the Antarctic Circle in one of the survey's ships.

Over the years women have lived and worked on South Georgia, including wives of the staff of the now disused whaling stations, and the Government station. In 1964 Mrs Dorothy Greene, wife of the B.A.S. chief botanist, Dr Stanley Greene, did field work there with her husband. Two American women, Edith Ronne and "Jinny" Darlington, actually wintered on Stonington Island with Finn Ronne's 1947-48 expedition. Mrs Darlington was the wife of Harry Darlington, senior pilot of the expedition.

Since then numerous other women have paid fleeting visits to the Antarctic Peninsula area on board tourist ships but no woman has ever been to Halley Bay. Some, however, may have entered the northern part of the Weddell Sea on whale factory ships or research vessels such as the Eltanin.

Nearly 30 years ago Mrs Hooley, a Falkland Islander, and her daughter, were in the Antarctic Peninsula area. They were passengers in the R.M.S. Fitzroy, which had been chartered from the Kalkland Islands Company to carry stores between Port Stanley and Deception Island for the establishment of the first British bases by Operation Tabarin, the secret war-time forerunner of the British Antarctic Survey.

Trevor Hooley and his family were on their way to South Georgia where he had been posted as radio operator.

The Fitzroy reached Deception Island on February 3, 1944, and Base B was established there. The second base could not be established at Hope Bay as the Fitzroy's thin plating was no protection against the ice.

Port Lockroy on Wiencke Island was therefore made the second base, Base A, and a hut was erected and the stores discharged on February 16, the day the Hooley family were photographed. The next day the Fitzroy returned to Port Stanley.

PEAKS ATTEMPTED

Climbers have been active again attempting peaks in the Allardyce Range, which forms the backbone of the central portion of South Georgia. In September a three-man expedition, assisted by three others, man-hauled a sledge five miles from King Edward Point over to Lyell Glacier where a base camp was set up. The weather was unusually good, and the three climbers soon established a second camp on the Hamberg Glacier.

From their second camp the climbers followed a new route up to within 1000ft of the summit of Mt. Sugartop (7,623ft). This mountain has been climbed only once—by the Combined Services Expedition of 1964-65. As the men were short of time the climb had to be abandoned, but they succeeded in establishing a second route across the range. Two days later the weather deteriorated. and as the tent on the Hamberg Glacier was blown down the party retreated to the base camp. From there they climbed Swinhoe Peak (2,770ft) before returning to base.

Later a second three-man party was taken by boat to the snout of the Nordenskjold Glacier in Cumberland East Bay. From there it visited the Ross Glacier at the southern end of the Allardyce Range.

FUCHS MEDAL

Two special events marked the annual B.A.S. briefing conference for new recruits in Cambridge. On September 10 the retiring director, Sir Vivian Fuchs, formally handed over to his successor, Dr Richard Laws; on September 12 he was presented with the first Fuchs Medal by Dr Laws.

The medal has been instituted in honour of Sir Vivian Fuchs by his past and present colleagues and associates, who responded immediately and generously to the original proposal. The medal is intended to be a means of acknowledging outstanding service to the B.A.S., particularly by those who are not eligible for the Polar Medal or other official or academic honours.

Twenty-five silver copies of the medal have been struck initially. It depicts Sir Vivian Fuchs on the obverse, and bears the words British Antarctic Survey on the reverse. Sir Vivian Fuchs was presented with the first medal, not only as a recognition of his outstanding service for 26 years, but also as a mark of affection and admiration from all those who contributed.

Plans for building a new B.A.S. centre at Cambridge where the various departments can be brought together have unfortunately been delayed. ("Antarctic" September, 1972, Pages 234-235).

WALTON FOLLOWS WALTON

One of the passengers aboard the Royal Research Ship Bransfield when she sailed from Southampton for the Antarctic Peninsula was the British Antarctic Survey's first second-generation recruit, a 23-year-old glaciologist, Jonathan Walton. He will winter with three companions at Fossil Bluff in George VI Sound.

Jonathan Walton's father Kevin served with the Falkland Islands Dependencies Survey from 1945 to 1948, and wintered on Stonington Island as a surveyor in 1946 and 1947. He was first with Surgeon Commander E. W. Bingham's team, and then with Major K. S. Pierce Butler when Finne Ronne's private American expedition of 1947-48 was also on Stonington Island.

Walton senr. wrote of his experiences in "Two Years in the Antarctic," His son will study deformation of ice shelves in George VI Sound, the energy balance of a local glacier, and the distribution of stable isotopes over the Antarctic Peninsula.

Studies of Ross Ice Shelf included in U.S. programme

Studies of the Ross Ice Shelf in an area about the size of France are included in the 65 projects of the United States Antarctic Research Programme this season. The National Science Foundation has allotted about $US7.5 million in 132 grants to support these projects, which involve research on the Antarctic Continent, from ships in Antarctic waters, and in laboratories in the United States. More than 30 scientists from seven nations have submitted proposals for the Ross Ice Shelf Project, which is part of U.S.A.R.P.'s glaciology programme.

Interest in the Ross Ice Shelf Project has increased because of its relationships to the ice fields of West Antarctica, and the possibility of significant ice changes during recent history. Also, the underlying waters, sea sediments, and possible life forms, are unexplored. The objects of the project are to understand the motion of the ice shelf and its history of change; to study the nature of the underlying organisms and their environment; to investigate the interactions between the shelf ice, the waters under the ice, and the adjacent ocean; and to study the sedimentary processes from the sea floor record.

This season scientists from the University of Nebraska, the University of Wisconsin, Virginia Polytechnic Institute, University of Copenhagen, and the United States Geological Survey, will take part in the project. They will study the ice thickness and its physical properties, water depth, characteristics of sediments and underlying rocks, and the measurement of tidal ranges and gravity. All this research, which will be supported by helicopters, will be in preparation for drilling the first hole through the ice shelf next season.

BIOLOGY PROGRAMME

The mystery of how a species of fish called Notothenia kempi avoids freezing to death at a temperature of 28deg Fahrenheit in Antarctic waters although it lacks the "antifreeze" that keeps other fishes in the region alive will be studied in the biology programme under the direction of a scientist from the Scripps Institution of Oceanography of the University of California. Specimens of the fish will be collected by trawling from an icebreaker near the Balleny Islands, 800 miles north of McMurdo Sound.

Many Antarctic fishes spend their entire lives in the icy waters surrounding the continent; fishes from temperate waters would quickly freeze to death in the harsh environment. The Antarctic fishes survive because they have evolved a glycoprotein with antifreeze properties similar to the ethylene glycol used in motor car radiators to prevent freezing.

Part of this year's project will be undertaken in the Eklund Biological Centre at McMurdo Station. The research will be aimed at finding out how the antifreeze functions in the McMurdo Sound fishes. Scientists will collect blood from a species of coal called Dissostichus mawsoni, purify the antifreeze compound, and study how it works.

The population dynamics of seals will be explored by University of Minnesota scientists in two areas of the Antarctic. One investigation will be near Palmer Station, off the Antarctic Peninsula, with the support of the research trawler Hero, This work will concentrate on the crab-eater seal in the pack ice during the breeding and pupping seasons. Attempts will be made to locate concentrations of seals and then to monitor the pupping behaviour, activity patterns, feeding characteristics, and growth of the pup from birth through weaning.

Work on the Weddell seal population will be continued at McMurdo Station. Scientists will concentrate on the nonproductive female segment of the population, and also will study the characteristics of male underwater territories.

Hydrophones and sonic tags will be used to measure the size of the underwater territory, and the changes in dominance characteristics of seals that inhabit these territories.

ATMOSPHERE STUDIES

As climate may change in the future because of fluctuations in natural phenomena or global air pollution, the Amundsen-Scott South Pole Station this season will be one of six "clean air" geophysical monitoring observatories of the National Oceanic and Atmospheric Administration. At these stations long-term measurements are made of atmospheric particles and other factors that can influence climate or shed light on climate processes.

During the season the Antarctic atmosphere will be monitored as high as 100,000ft by instruments carried aloft by balloons. Particle and water vapour measurements will be examined by a scientist from the National Oceanic and Atmospheric Administration's environmental research laboratories in Boulder, Colorado, to determine the cause of heat increase.

Measurements will be made of carbon dioxide to determine the annual rate of increase of this gas in the atmosphere because of combustion of fossil fuels. Ozone measurements will be made to study short-term variations in climate caused by shifts in concentrations of this gas.

A scientist from the Bartol Research Foundation, Swarthmore, Pennsylvania, will use precision cosmic ray detectors at McMurdo and South Pole Stations to exploit the special advantages of the polar regions for providing information about the electro-magnetic conditions in space, about the earth's environment, and about fundamental processes occurring in the earth's upper atmosphere, in the interplanetary medium, and in the sun.

SHIP OPERATIONS

The Coast Guard icebreakers Glacier and Staten Island, which will lead the way to Antarctica for the supply ships and break a channel through the McMurdo Sound ice this month, will act as oceanographic platforms during the summer. Scientists aboard the Glacier will conduct oceanographic studies of bottom waters and currents in McMurdo Sound. Aboard the Staten Island scientists will investigate the physiology and biochemistry of freezing resistance in fishes in McMurdo Sound ,and will study seals and conduct a seal census off the Wilkes Land coast.

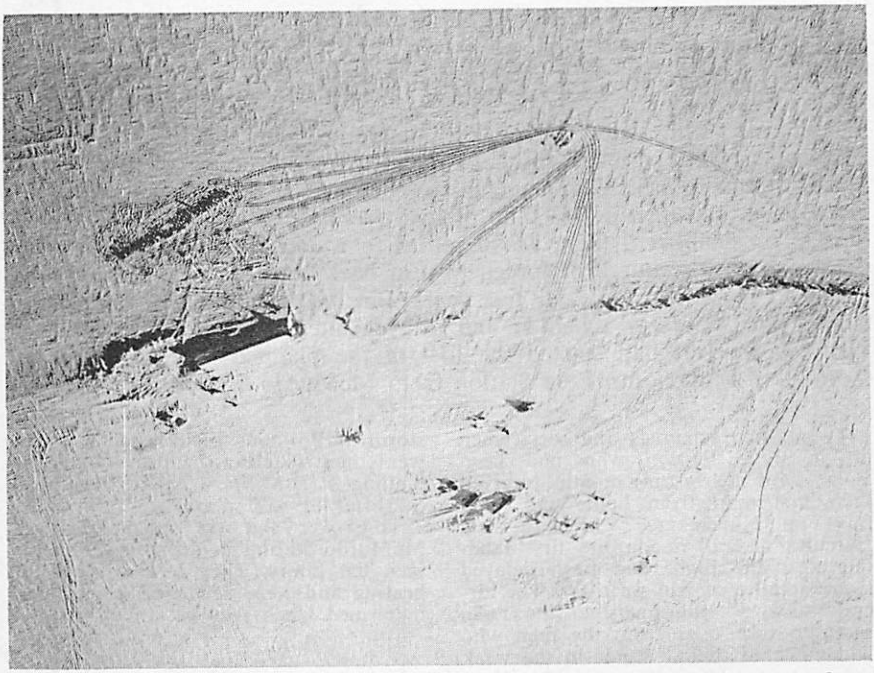
Also in Antarctic waters will be the National Science Foundation's research trawler Hero, which carries seven scientists and a crew of ten. She will operate throughout the summer from Palmer Station in the region of the Antarctic Peninsula.

Television begins in Antarctic

Americans and New Zealanders working in the Antarctic were able to watch television for the first time on November 9. The programme, transmitted on a closed circuit system, began with a brief address by the United States Navy's Chief of Naval Operations, Admiral E. R. Zumwalt.

Twenty-eight television sets around McMurdo Station and at Scott Base have been linked to a studio which is located in the station's biggest building —the barracks which house almost all the servicemen. There is a dual transmitting system—from a 60ft mast outside the building, and from nearby Observation Hill.

The closed circuit system has cost about $85,000. It differs from the standard television system on board about 150 United States warships, being portable, more compact, and more sophisticated. Transmission is for about eight hours—from 4 p.m. to midnight, and provision has been made for sets to be placed at Williams Field, the ice runway six miles from McMurdo Station.



Siple Station, the most isolated United States station in Antarctica, seen from the air. Built in 1970 at the foot of the Sentinel Mountains in Ellsworth Land, it is 1,350 miles from McMurdo Station and less than 1,000 miles from the South Pole. This year, for the first time, the station was occupied all winter by four men, the smallest completely isolated American group to winter in the Antarctic since 1934. —U.S. Navy Photo

No Salvage of Plane at Pole

America's "flying grandfather", Max Conrad, now 77, is still the only pilot to make a solo flight to the South Pole. But he has failed twice to achieve his ambition of flying around the world over the North and South Poles.

In 1969 Mr Conrad reached Adelaide Island off the west coast of the Antarctic Peninsula but had to turn back. He flew his twin-engined Piper Aztec safely from Invercargill to McMurdo Station on January 12-13, 1970. Six days later he flew to the Pole. His aircraft crashed, however, on January 23.

The Piper Aztec now lies under several feet of snow at the Pole. Last month Mr Conrad was in Christchurch, and dreaming of salvaging his abandoned aircraft, which now belongs to an American engineer, Mr Walter Pederson, who was a member of a snowmobile expedition which reached the North Pole in 1968, and abandoned a planned snowmobile journey from McMurdo Station to the South Pole in 1971.

When Mr Conrad abandoned his aircraft he collected the insurance money. Then Mr Pederson bought the salvage rights from the insurance company. He told Mr Conrad he could have the aircraft if he salvaged it.

Mr Conrad learned when he discussed the salvage of his aircraft with Commander R. G. Davis, commander of the United States Navy's Antarctic support force base at the Christchurch Airport, that the work would involve considerable time and effort.

STORMS AND WHITE-OUTS DELAY EARLY STARLIFTER FLIGHTS

Storms, white-outs, and gales, interrupted the airlift of scientists, servicemen, and supplies to the Antarctic by Starlifters of the United States Military Airlift Command in October. After the first summer flight which took 100 men and 3000lb of mail from Christchurch to McMurdo Station on October 9 there was a return to winter weather; aircraft were delayed at Christchurch or forced to turn back; and the McMurdo Sound area had its worst storm for five years. But by the middle of last month supply flights were on schedule, and United States Navy's VXE6 Squadron Hercules aircraft had started the first of the planned 135 flights to the Amundsen-Scott South Pole Station from McMurdo Station.

Twenty-two scientists and servicemen at the Pole Station who had been isolated for nearly nine months received their first mail from home and fresh food on November 7 when a new Hercules aircraft made the first landing after the flight had been delayed twice because of bad weather. The aircraft took 37 passengers to the Pole, some to take over from the men who had wintered there. Later in the week the winter party was flown out.

Four men, the smallest isolated American group to winter in the Antarctic since 1934 were flown 1350 miles to McMurdo Station by a VXE6 Squadron Hercules early this month. They had been at Siple Station in the Sentinel Mountains of Ellsworth Land for nearly a year.

Two scientists from Stanford University, Messrs W. J. Trabucco and E. W. Paschal, the station doctor, Dr R. D. Threlkeld, and the engineer, Mr J. C. Klinck, were the first to spend the winter at Siple Station, which has been manned only in the summer since it was built in 1970 on ice more than a mile thick.

A nine-day delay in flights from Christchurch to Williams Field, six miles from McMurdo Station, was caused by the worst storm in five years towards the end of October. Winds gusting to 70 miles an hour swept the area, leaving a trail of snow drifts up to 5ft deep round the station.

There was another bad storm on October 26. Winds gusting from 50 to 60 miles an hour created a white-out and trapped 47 men for several hours near McMurdo Station. A convoy of 18 vehicles was caught in the storm at Williams Field when the men went there to clear the runway for the landing of a Military Airlift Command Starlifter at 4.30 p.m.

To cover the six miles back to McMurdo Station in the storm took the men ten hours. They had no food or heating and were tired and hungry but unharmed when they returned.

Winds wreck U.S. helicopter

Winds blowing at a speed of more than 100 miles an hour wrecked a United States Navy VXE6 Squadron helicopter which had been temporarily abandoned at Cape Crozier, on Ross Island, because of a gearbox fault. The helicopter, which had been roped down, was a total loss.

On November 4 the helicopter was used to fly United States Antarctic Research Programme scientists to the penguin rookery at Cape Crozier. When the scientists had finished their work and it was time to leave, the helicopter's instruments indicated a fault.

Because of impending bad weather the helicopter was tied down as best as possible, and a second helicopter was called to ferry the scientists and crew back to McMurdo Station.

When the weather cleared a party flew to Cape Crozier with spare parts to repair the gearbox fault. But it was found that the high winds had overturned the helicopter, damaging the rotor system and fuselage beyond repair.

McMurdo station to lose its nuclear power plant

In the next three years the nuclear power plant on Observation Hill overlooking McMurdo Station will be dismantled and removed by the United States Navy. Nuclear power has been used to supply electricity to the station for more than ten years. The plant was operated from March, 1962, until September, 1972, when it was closed because of possible corrosion. Since then power has been supplied by a diesel generating plant which will be enlarged this season.

Captain A. N. Fowler, commander of the Navy's Antarctic support force, who announced the removal of the nuclear power plant, said there were no plans to instal another plant in the Antarctic. Dismantling of the present plant would begin this season. There would be no radiation danger; all radioactive material would be shipped back to the United States for disposal —even some of the earth surrounding the plant.

Although the nuclear plant has been closed for more than a year it is not unsafe. An inspection last year revealed that insulation containing chlorides around the reactor piping system had become wet. No corrosion cracking was found but the high cost of a full inspection—a minimum figure of $US1.5 million—resulted in the decision to dismantle the plant and remove it.

FUNDS REDUCED

This season the funds provided by the National Science Foundation in logistic support for the scientific programme through the naval support force have been reduced to $US15.9 million compared with $US19 million last season. As a result the support force will have about 80 men less than last year.

Since the National Science Foundation became responsible for the management and financing of the United States Antarctic research programme more work has been done by civilian contractors. Contractors operate Siple and Palmer Stations, and the research trawler Hero. and will do construction projects in future years.

Captain Fowler referred to the trend towards using more civilians in the Antarctic programme when he arrived in Christchurch at the start of the season. He said that the use of civilians would allow servicemen to get on with the jobs they were trained to do. There would be 25 civilians in the messhall at McMurdo Station this summer, and civilian contractors working on the continent. However, such changes would be gradual.

MORE WOMEN

Women are now playing a greater role in United States and New Zealand research programmes in the Antarctic. This season there will be 13, ten Americans and three New Zealanders, on the continent, including two women in the messhall.

The Navy also is keeping up with the times. This season it has its first woman officer in the Antarctic. Lieutenant Ann E. Coyer is serving as administrative officer at McMurdo Station. Commander R. C. Balchunas, deputy commander of the support force, says that in future it is likely that more servicewomen will do tours of duty in the Antarctic. Initially they will be appointed to administrative and hospital duties if there are vacancies and if a qualified woman is available.

Men at South Pole station catch colds after winter

Two women, the first to work at the Amundsen-Scott South Pole Station, have spent several weeks there assisting an American microbiologist, Dr H. G. Muchmore, of the Oklahoma Medical Research Foundation, in a medical research programme which could apply eventually in the battle against the common cold. Mrs Muchmore and Miss N. Scott have tested men at the station for their immunity to respiratory infecions. Dr Muchmore says that learning why some men lose their immunity and others apparently do not could lead to some method of boosting immunity to such infections.

Dr Muchmore began his research at the Pole Station last season but he did not have sufficient time or enough assistance. Before he flew south from Christchurch last month he outlined his programme.

Men who winter in the Antarctic and thus are isolated for several months are very prone to catch colds when they are exposed to outside contacts again. Those at the Pole Station are isolated for longer than any astronaut to date, and longer than the crews of nuclear submarines.

More than half the Americans who winter on the continent are hit by respiratory infections four to six weeks after the first aircraft arrives at the end of the winter. Dr Muchmore says this suggests that in isolation the men lose much of their normal immunity. The same might apply to other types of isolation, including prolonged space flights. Immunity loss could become a factor if and when longer space flights take place.

Dr Muchmore's research is likely to take several years. It will include tests on men before they leave the United States for the Antarctic, tests of the specimens which are collected regularly from each man in the winter parties, and further tests of men who have finished their season's work.

PENGUIN STUDIES

Fifteen Adelie penguins were taken to the United States this month to enable an American scientist from the Scripps Howard Institution of Oceanography to continue his studies into the regulation of the body temperature of vertebrates. Twelve of the 15 birds will have thermodes implanted in their brains to help Dr H. Hammel, a professor of physiology at the institution, learn how the central nervous system is organised to regulate temperature.

Dr Hammel has carried out this particular type of research on a variety of birds, fish, reptiles, and mammals, for more than eight years. He chose Adelies because they were more manageable, and were tractable and quite fearless birds. They will be kept indefinitely.

In 1970 Dr Hammel was at Palmer Station, on Anvers Island, off the Antarctic Peninsula, and took four penguins back to his laboratory in California for similar research in preparation for this summer. All these birds died, two because detergent used in a bath they were given washed their body oils out, and the other two from heat stress because of lack of adequate refrigeration. This season proper facilities will be available for the Adelies.

Twenty-five penguins will be collected from Cape Crozier on Ross Island this month. They will be taken by helicopter to McMurdo Station for preliminary research. Dr Hammel will be assisted by Mr F. Todd, curator of birds at Seaworld, San Diego.

LAST TWO ANTARCTIC DAKOTAS

Only two of the 17 Dakota (R4D) aircraft used in Antarctic operations by the United States Navy between 1955 and 1967 are still in existence. Que Sera Sera, which made the first landing at the South Pole on October 31, 1956, is now in the Smithsonian Institution National Air Museum, Washington.

The other Dakota or Skytrain named Yankee Tiki a Te Hau by its crew, which flew 493½ hours in the Antarctic between 1963 and 1966, has also become a museum piece. One of the oldest military Dakotas in the world—it first to an open-air museum at Ferrymead flew in 1942—it was taken last month from the Christchurch Airport where it had been since 1969.

Dakotas were first used in Antarctic operations in 1947 during Operation Highjump, the third expedition led by Rear-Admiral Byrd. Six aircraft were flown off the carrier Philippine Sea to land at Little America IV. They were left on the ice when the expedition returned to the United States.

Four Dakotas were flown to the Antarctic again—this time from New Zealand—in 1956 during the second season of Operation Deepfreeze. Until 1961 when they were replaced by Hercules aircraft the sturdy Dakotas flew men, scientific equipment, and cargo to the Amundsen-Scott South Pole Station and other inland stations, operating from McMurdo Station.

Yankee Tiki a Te Hau was flown by Navy and Marine Corps pilots, and then was assigned to VX6 Squadron. It was flown in October 1963, to the Antarctic where it made 218 ski landings and 27 wheel landings. In April 1966, it was brought back to Christchurch for overhaul. Then it was used for local missions, and training and proficiency flights.

Dakotas were withdrawn from Antarctic service in 1967, but Yankee Tiki a Te Hau kept on flying. After nearly 27 years service it flew for the last time on February 22, 1969. It made a three-hour training flight and it was handed over to the Ferrymead Museum.

Painted on the fuselage of the aircraft are a large Maori tiki, the grotesque symbolic figure now regarded as a good luck charm, and a kiwi, the New Zealand flightless bird. The names of the aircraft commander, Lieutenant H. M. Morris, the navigator, Lieutenant-Commander R. Rosenthal, the co-pilot, Lieutenant W. D. Fordell, and three enlisted men, C. C. Kelley, W. M. Shattuck, and R. S. Simmons, also appear on the fuselage.

The crew of the veteran Dakota had good luck with them when the flew in the Antarctic. They gave their aircraft a name which, in English, means Yankee Tiki of the Air.

BYRD'S GRANDSON AT POLE

Rear-Admiral R. E. Byrd flew over the South Pole three times, the last in 1956. His son, Richard, went with him to the Antarctic in 1955-56. Now his grandson, Robert Byrd Breyer, is working at the Amundsen-Scott South Pole Station, which his grandfather never saw.

Mr Breyer is the son of Katherine, one of Admiral Byrd's three daughters. He is an operations officer in a savings bank in Los Angeles. Early in September he had the opportunity to go to the Antarctic as a general field assistant and work for the civilian firm responsible under contract to the National Science Foundation for the construction of the new Pole station.

Twenty-four-year-old Mr Breyer has read his grandfather's books on Antarctic exploration; now he has gone south to see for himself the changes that have occurred since Admiral Byrd was there for the last time in 1956.

SOVIET NEWS

Scientists to use aircraft in East Antarctic research

Scientists of the 19th Soviet Antarctic Expedition will use aircraft this season to conduct large-scale geological, geophysical, geodetic, and cartographic research in Eastern Antarctica. Other projects in the research programme include experimental drilling into the ice-cap on which Vostok Station stands, a tractor traverse from Mirny to the station, and completion of the geological, geophysical, and geodetic survey started in Mac-Robertson Land two years ago.

Six aircraft and four helicopters will support the field work of the expedition. The first group left for the Antarctica in October. Led by Dmitri Maksutov, an experienced polar explorer, the expedition has 750 members—scientists, sailors, airmen, tractor drivers, and builders. Of these nearly 230—experienced explorers and newcomers to Antarctica, will winter at six Soviet stations.

For the first time since 1956 the research and supply ship Ob will not be going south. She needs repairs after her 450-mile drift in heavy pack ice earlier this year. The Ob has been replaced by the research ship Professor Vize, which has made several Antarctic voyages.

TWO FREIGHTERS

Two diesel-engined freighters, the Olenyok and the Vasily Fedoseyev, specially reinforced for ice work, will make their first voyage to the Antarctic. The refrigerated vessel Nina Sagaidak will carry perishable supplies, and passengers will be carried by the 5261-ton motor ship Bashkiria.

This season oceanographic, glaciological, geophysical, and hydrographic research will be continued in the Antarctic Ocean. Complex research will be carried out on a vast hydrographical section between Antarctica and Africa. Teams of scientists will work in the area of the Lambert Glacier and the Amery Ice Shelf, in the I.G.Y. Valley, and in the mountains far to the south.

Regular rocket soundings of the atmosphere at altitudes of up to 75 miles will be undertaken from Molodezhnaya Station, the main Soviet research centre in Antarctica. These firings will be conducted simultaneously with those carried out by a Soviet-French expedition off Kerguelen Island, at Tumba in India, at the observatory in Volgograd, and the Krenkel observatory on Heyss Island.

All these places lie along a line between Longitudes 60deg and 70deg E. American observers will be operating between Longitudes 60deg and 70deg W. Data supplied by the chain of stations will be processed by the Minsk-32 computer installed at Molodezhnaya Station.

WEATHER REPORTS

Molodezhnaya Station's powerful radio centre will continue to gather meteorological information from all Antarctic stations and those in New Zealand, Australia, South Africa, and South America. Weather maps compiled from this information, and from satellites, will be transmitted to Moscow and various agencies of the world weather forecasting service. The station has a special forecasting service for whaling flotillas, and fishing and merchant ships operating in the Southern Hemisphere.

Vostok Station was established in 1957 on an ice cupola which rises 11,550ft above sea level. Scientists there have been studying the ice-cap which is more than 9,900ft thick. A hole 3135ft deep has been bored into the ice with a special drill. The first results obtained provided new data on climatic changes in the Antarctic over the last 20,000 years.

A hole to be drilled through the entire thickness of the ice-cap will enable Soviet scientists to study Antarctica's paleo-climate within 500,000 years. This in turn, will provide a basis for forecasting climatic changes in the near future. An experimental drilling of the hole will be continued by thermal and electro-mechanical methods.

Research programmes at other Soviet stations will include medical observations directed to studying the mechanism's of man's adaptation to Antarctic conditions. Among biological problems to be dealt with this season will be the yearly biological cycle of seals around Bellinghausen Station.

FLOATING ICEBERG 280 MILES OFF MIRNY USED IN AIRLIFT

A floating iceberg 280 miles from Mirny was used as an "aircraft carrier" when the cargo icebreaker Navarin picked up a group of Soviet scientists who had completed their term at the station. An aircraft and a helicopter were used in the airlift.

The Navarin, which went to the rescue of the research and supply ship Ob when she was trapped in heavy pack ice off the King George V Coast late in April, sailed for Mirny after helping to transfer 55 men to the research ship Professor Zubov. Ice conditions in the Davis Sea prevented her from coming into Mirny so the ship and station were linked by the aircraft and helicopter, using the iceberg as a transit facility. The aircraft flew the scientists to the iceberg where they were picked up by helicopter.

SIX DEGREES

Later reports about the Ob disclose that she was 40 miles off the Oates Coast, having resupplied Leningradskaya Station, when she was hit by the Force 12 gale. She was caught in an icefield of about 1200 square yards nearly 40ft thick, and the pressure lifted her 5ft above the ice, giving her a permanent tilt of six degrees. Her diesel engines were put out of action.

Strong winds and heavy seas on July 22 broke up the ice of the so-called Balleny Massif which had held the Ob for so long. In the September issue of "Antarctic" we referred in error to the Ballen Massif.

FIRST SKUA GULLS SIGHTED

The first skua gulls of the Antarctic summer were spotted sitting on the ice of McMurdo Sound about 2000ft offshore from McMurdo Station on October 26. At the start of each season American servicemen traditionally bet on sighting the first bird, penguin or seal.

Radioman J. Taylor spotted the gulls at 10.40 a.m. and, according to the rules of the game, had the sighting verified by the station chaplain, Lieutenant J. Trett. But his 50 cent ticket in the sweepstake did not win him anything because the prize goes to the man who guesses the time of sighting. First prize of $50 went to Lieutenant-Commander T. Chider, commander of the United States Navy's VXE6 Squadron helicopter unit.

SANAE REPORTS

Summer field party visits Depots, mountain bases

South Africa's 15th Antarctic expedition will sail in the research ship RSA for Sanae Base in western Queen Maud Land from Cape Town between January 5 and 7. The new team of 22 men has received nearly three weeks training in Pretoria. It will be led by Mr R. van Mazijk, who was a member of SANAE 12. Last month the RSA completed her annual relief voyage to Gough Island. She also made a special voyage to Marion Island with additional fuel.

A field party of six expedition members left Sanae Base for the mountains on October 25. The purpose of the journey was to replenish depots and Grunehogna, the geological base in the Ahlman Ridge mountain range, with fuel and food. Borga Base was also visited.

Grunehogna is 215 kilometres south of Sanae Base. It has been occupied for the past winter by two geologists, a surveyor, and a radio echo sounding technician. The winter programmes they carried out were fruitful although continuous winds, not lower than 40 knots and at times gusting up to 118 knots, were experienced.

Aurora and airglow programmes at Sanae were stopped for the summer months at the end of September. This came as a welcome gift to the two operators who spent many hours climbing up and down hatch ladders and stumbling outside in the winter darkness.

Interesting airglow data were collected during the last period of proper darkness when the usual meridian scanning photometer was kept stationary in the zenith position. The digital intensity signal, converted to an analogous one was recorded on chart.

In addition to Mr van Mazijk, the SANAE 15 team will include: Messrs J. N. van Zyl (senior meteorologist), D. G. Cillie, D. I. Rowswell (meteorologists), R. D. J. Gavshon, J. N. Erasmus (geologists), J. N. van Schalkwyck (surveyor), physicists, B. Bowers (cosmic rays), J. R. Riley (ionosphere), E. Terblanche (geomagnetism), G. R. Linscott (whistler and micropulsations), C. U. Schultz (airglow and seismology), W. A. Smith (electronician), C. L. de W. Lambrechts, J. A. Stark (senior mechanics), J. F. Scott, D. B. Buckley (mechanics), H. L. B. Helberg, A. B. D. Kuppen (communicators), S. D. Mandy (radio technician), H. P. Barnard (radio echo sounding technician), and Dr W. D. van Deventer (medical).

Mr W. A. Smith is a member of the team at present in the Antarctic, and therefore he will remain for a second year. Mr Stark was a member of SANAE 11, and Mr Rowswell has just returned from Gough Island where he served for a year.

The RSA left Cape Town for Gough Island on October 6 and arived back in Cape Town on November 17. She also visited Tristan da Cunha at the request of the British authorities. A reconnaissance team of Dr N. Fairall, Dr P. Shaugnessy and Mr A. N. T. Villiers travelled in the ship to investigate the possibilities of extending biological research to the island.

Also aboard the RSA were two members of the South African National Film Board. It is expected that the results of their work will be available in the form of 16mm and 35mm films towards the middle of next year.

On November 22 the RSA left for Marion Island on its special voyage with additional fuel. Two biologists were also transported to the island. Four more will be taken there on board the French relief vessel Marion Dufresne, which is expected in Cape Town on December 17.

The Marion Island team had a surprise during the winter—a visit by two Russian ships. One morning early in August the team woke up to the sight of two foreign ships lying at anchor off Gunner's Point.

Team members could scarcely believe their eyes because apart from the annual relief voyages of the RSA visits by other ships are very rare. There was an hour of frenzied activity to lower the landing platform and the Russian visitors were welcomed ashore.

The unexpected visitors were seeking shelter in the lee of the island to transfer cargo and a sick member of one crew between the two ships, the stern trawling factory ship Chatyr-dag, and the stern trawling fishery research ship Skiff. They were treated with genuine island hospitality, and in turn three members of the team were invited to dine on board the Chatyr-dag.

SOUTH AFRICANS MAPPED OCEAN FLOOR MAGNETISM

By L. O. NICOLAYSEN

Director, Bernard Price Institute of Geophysical Research, University of the Witwatersrand, Johannesburg, South Africa.

During the months of June and July the Antarctic relief vessel RSA made her second relief voyage of 1973 to Marion Island, where South Africa maintains a scientific base. Her scientific party included Dr Hugh Bergh (chief scientist) and Ian Norton, of our institute, on their fourth voyage into the Southern Ocean since 1970. Variations of magnetic field intensity were obtained from a towed proton magnetometer, a seismic "airgun" and "eel" measured sediment thickness, and the echo sounder recorded the ocean depth.

These measurements were made during three weeks of traversing, mainly to the north-north-east of Marion Island. Navigation was tightly controlled by the very-low-frequency Omega system. Progress was summarised in the cable message which I received on July 5.

"Ship hove to because of bad weather from west everything hauled in and lashed down. John Hope pre-amplifiers and amplifiers used to obtain one second penetration in force ten gale. Omega fine but complete loss of several hours on morning of sailing June 30. Ask N.P.R.L. time standards why no leap second change. Present position 35.30S and 29E."

Why are these men dedicatedly and precisely mapping the ocean floor's magnetism more than 2000 km away from South Africa?

Their dedication becomes more understandable when we learn that about 20 ships, under several flags, are now carrying geophysicists for similar magnetic mapping in all of the deep oceans. The key fact is that maps of the intensity of the magnetic field over the deep ocean are immensely simpler than maps obtained by towing an airborne magnetometer over a continent, or over shallow seas. Their contoured maps show very long and regular stripes; all of the ocean basins except the North Pacific have a

mountain ridge in a central position, and the magnetic stripes are always parallel to this median ridge. It can also be shown that the magnetised rock, responsible for the striped character, lies just a very few kilometres below the sea floor.

Can this striped character of the uppermost skin of rock in these ocean basins be explained? One theory—termed "ocean floor spreading"—has been very successful in explaining this striking and regular pattern. Contributions from Hess, Vine and Matthews were crucial in establishing this theory ten years ago.

Imagine a tape recorder with a recording head 30 centimetres long, so that it emitted recorded tape in a wide sheet rather than a ribbon. Imagine this tape recorder passively emitting two wide tapes in opposite directions from the head, instead of one. A specific musical note, recorded at one instant, would be lying (a few seconds later) in the form of two long magnetised stripes, one on each of the wide sheets, parallel to the recording head.

Now the mid-ocean ridge crest is acting as an immense tape recorder, passively emitting two wide and symmetric tapes in the form of magnetised sea floor. The mechanics of this system arises from the continual ascent of hot volcanic lava up the centre of the mid-ocean ridge. After it solidifies, it splits exactly into two as it makes way for injection of more hot lava up the central position. (A bowl of molten candlewax which cools to form a thin solid skin behaves in exactly this way.)

The magnetic aspects are determined by the fact that the earth's magnetic field reverses its direction periodically, with time-intervals between "flip-over" of 10^5 to 10^7 years. As the solid lava cools through the Curie temperature, it becomes magnetised in the direction of the ambient field. Thus the "black" stripes represent sea-floor lava magnetised in the direction of the present magnetic field, and the "white" stripes represent magnetisation in the opposite sense.

When the "striped" magnetisation of the sea floor near Marion Island is mapped in detail, it gives us a clear record of the position of the mid-ocean ridge with respect to Africa and Antarctica during the past 100 million years.

Marine studies of the magnetic field and the features of the ocean bottom provide a most powerful tool for understanding the complex processes whereby the southern continents have drifted away from each other. They offer immense new insights concerning the motive forces controlling geology. South Africa's Department of Transport has displayed not only fine co-operation, but also vision, in permitting such research to be carried out during the RSA's relief voyages to the south.

BRAZIL MAY SEND EXPEDITION

Brazil may have a scientific expedition in the Antarctic next month. According to the Rio de Janeiro newspaper, "O Globo", the Brazilian Merchant Marine planned to buy a Norwegian laboratory ship for work in the Antarctic.

Brazil, which is not a signatory of the Antarctic Treaty, was reported last year to be organising its first scientific expedition to the Antarctic Peninsula. The expedition was to be sponsored by the Engineering Club in Rio de Janeiro.

The co-ordinator of the expedition's scientific programme was a Brazilian meteorologist, Mr R. J. Villela, who was in the Antarctic with the Americans in 1961 and 1962. A request about possible purchases of cold weather clothing and other equipment received by the Antarctic Division, Department of Scientific and Industrial Research, suggested that there would be about 30 in the Brazilian party.

SCOTT ISLAND AND ITS DISCOVERY

By A. G. E. JONES

British, French, Norwegian, Australian and American explorers have honoured the memory of Captain Scott by giving his name to features of the Antarctic Continent. On the map of Antarctica can be found the mighty Robert Scott Glacier, the Scott Range on the coast of Enderby Land, and Mount Scott on the Antarctic Peninsula. First to be discovered and named was a tiny island in the Ross Sea about 315 miles north-east of Cape Adare and almost on the 180th degree of longitude.

There is something fascinating about remote islands, Jones writes. Scott Island, in the northern part of the Ross Sea, about 400 miles from the nearest land, has the added interest of having been unknown until the beginning of the present century. And developments in the theory of continental drift and plate tectonics add further interest since Scott Island lies on one of the lines where the magma is welling up from deep in the earth and slowly pushing the continents apart.

The "Antarctic Pilot" gives a factual description of Scott Island from the mariner's point of view: this note gives an account of its discovery by Captain W. R. Colbeck in the Morning. The island still excites interest. Captain Magnus Olsen has recently told in "Saga of the White Horizon" how the Wyatt Earp passed close to Scott Island in 1934 but could not see it because of poor visibility.

Readers of "The Times" learned on May 11, 1903, that the Morning had not been able to relieve the Discovery. At the end of a full column of small print, they read that on the previous Christmas Day, about three weeks after sailing from Lyttelton, Captain Colbeck had crossed the Antarctic Circle and had discovered two islands. In July, in an article on the first year's work of the National Antarctic Expedition, Sir Clements Markham, president of the Royal Geographical Society, was able to state:

> "In about 67deg 40min S., an interesting discovery was made of a new island, of which excellent photographs were taken. A landing was effected, and a survey made; it was named Scott Island." (1)

This was unexpected as the northern part of the Ross Sea was fairly well known, having been traversed four times by Captain James Clark Ross in 1841-42 and 1842-43, twice by the Antarctic, Captain L. Christensen, in 1894-95, four times by the Southern Cross in 1898-1900 and also by the Discovery on her way south in 1902.

Captain William Colbeck, master of the Morning, 437 tons gross, 297 tons net, was dispatched by Sir Clements Markham to find the Discovery which was believed to be frozen in somewhere near the Ross Sea. Colbeck, then 30 years old, knew those waters, having been first mate in the Southern Cross for two seasons.

The first mate of the Morning, a man of 25 years of age, was Rupert G. England, who later made his mark as master of Shackleton's Nimrod in 1907-08. The second mate, E. R. G. R. Evans, then just 21, went on to become well known in the Antarctic and the Royal Navy. Gerald S. Doorly, third mate, will be remembered for his book and for his memoirs in "Antarctic". Still only 20 years old was the fourth mate, Sub-Lieutenant G. F. Mulock, from H.M.S. Triton, a navigator who prepared Scott's maps from his surveying

observations. (2)

The discovery received little publicity at the time, partly because Markham had laid down that nobody should publish any information within one year of return and that all collections, sketches, etc., should be the property of the Royal Geographical Society. With the brevity he reserved for the achievements of others, Scott described it in one sentence:

> "On December 25 he crossed the Antarctic Circle, and a short way to the south, to his great surprise, discovered some small islands which he has since done me the honour of naming the Scott Islands." (3)

Strangely, through a clerical error, the Scott Islands did not appear on the map of the Ross Sea prepared by Mulock.

Fortunately, in addition to Colbeck's fuller report which was published in the "Geographical Journal", there is an authentic and detailed (though laconic) first-hand account of this discovery in the "Log Book of the Antarctic Relief Ship Morning from the Port of London to South Polar Regions, Commanded by Capt. W. Colbeck, R.N.R., commencing July 9, 1902, ending January 18, 1903. Kept by Rupert G. England."

Here, in a standard merchant ship log book, printed and sold by J. D. Potter, Admiralty chart agent, is the official record. (4)

England notes the sighting of the island at 2 p.m., the presence of many icebergs, drift ice and floe. The Morning stopped off the island, and launched a boat at 8.30 p.m. A landing was made at 9.30 p.m.

A fuller account was given by Gerald Doorly. It was Evans who sighted the island which (with its ice-cap) could have been taken for one of the many large, discoloured icebergs which surrounded the Morning. It was then about 20 miles distant, and it is more likely to have been Haggitt's Pillar, a rock of 209ft, which caught Evans' eye, Scott Island itself being only just above the horizon at that moment. (5)

The size of the island, a quarter of a mile from north to south, and 1½ cables wide, was misjudged by Doorly who wrote some 13 years later: "Early in the evening the island was reached and was estimated to be two miles in length with a remarkable cone-shaped island close off it. . . ."

Doorly went on to say that a party then ". . . landed and officially claimed the island in the name of Great Britain . . . a record was left on the island stating the discovery and the date. The ship lay off for the night . . . it was eventually decided to call it Markham Island for Sir Clements, but it was subsequently altered to Scott Island."

It was the chief engineer, J. O. Morrison, who landed on Scott Island, obtaining samples which showed it to be of volcanic rocks of comparatively recent date, clearly related to the trachyte of Cape Crozier. The geologist's report later said, ". . . trachytic rock, No. 1 was taken from the south-eastern side, Lat. 67deg 24.5min S., Long. 179deg 55min 5sec W., being broken off the highest accessible point, about 12ft above water-level. The strata seems about 2ft thick, dipping to the south-east side at an angle of 45deg, striking S.W. and N.E."

The present-day chart shows that it lies on a bank 11 miles from north to south and about five miles from east to west, with a bank of only 33 fathoms some 15 miles S.S.W. by S. It lies on a major fault line. (6)

Although there was continuous daylight, it was wise to stand off from this unknown land for the night, and (as Doorly described) make a fuller examination next morning.

> "Next day the forenoon was devoted to making a rough survey of our discovery. Here was an opportunity for our surveyor, Mulock, who kept us busy taking sextant angles, altitudes, chronometer times, soundings and speed registers. It was arranged that lines of soundings be taken from close in shore out to sea on the four cardinal points. . . ."

These were carried out successfully from east to west, but steaming about

four knots along land to get into position for the run out to the southward, the Morning unfortunately struck on an outlying rock. (7)

The first mate's log book was much more matter-of-fact about it:

At 1.15 p.m. ship touched on a sunken rock about 1 cable's length from the shore whilst under easy steam sounding. Peak N.N.W. Ships Hd. East. Wind N.N.E. Yards sharp up for Stard. Tack (Water 3 fthm aft and 5fthm forwd.) Full Spd. astern and set mainsl aback and swung fore yards and set sail forwd. 1.15. Ship fell off into deep water to Sd. Full ahead. Filled in Main Yards and set all plain sail and stood away to Sd. Ship making no water. A small portion of false keel torn away, the only damage known. . . 4.30. Passing through quantities of loose pack ice.

Doorly described the behaviour of "our cool and collected commander. . . The captain picked up his camera, and took a final snap-shot of the island, 'to show there was no ill-feeling'. . ." From this point Captain Colbeck made the best of his way to relieve Scott, but it was another month before he sighted the Discovery. (9)

It appears that Scott, on his southward passage in the first season had passed within 40 miles of the Scott Islands on January 3 and 4, 1902, but was too far off by some 20 miles to catch a glimpse of them.

The Scott Islands were sighted again on January 3, 1904, by the Morning and the Terra Nova on their way to McMurdo Sound to relieve the Discovery again. On this occasion the second officer of the Terra Nova drew a small pencil sketch of it in his log book; but he must have viewed it from a distance and failed to distinguish the ice-cap of the main island. (10)

Captain Colbeck described the discovery of Scott Island in his observations on the Antarctic sea ice, which appeared in a review of results of the National Antarctic Expedition, printed in the April, 1965, issue of the "Geographical Journal". Here is Colbeck's account:

On December 25 we sighted two small islands, bearing south-south-east, about 25 miles distant. We took a sounding when about five miles north-north-west of them, and got no bottom at 1000 fathoms*. The larger island is about $\frac{3}{4}$ mile long and $\frac{1}{8}$ mile broad, lying in a N. by E. and S. by W. true direction, the northern end being about 126ft high, and "steep to." The southern end was lower, and partially covered with an ice-cap sloping from the northern end, and appearing to get much thicker where it discharged into the sea. The northern extremity was almost bare of snow, much weathered and water-worn at the base of the cliffs.

In each of the northern points there was an arched rock, the larger of which was about 80 feet high and 50 feet broad. The smaller island was almost circular, was about 200 feet in diameter, to a height of about 185 feet, with a conical top (the summit of which was about 209 feet above sea-level) and was situated nearly a cable's length to the north-north-west of the larger island.

Whilst pulling around the larger island we noticed two beaches—one on the west-by-north, and the other on the north-north-east side. The first we estimated at 80 feet long, and the latter 50 feet, both shelving very rapidly, and making it impossible for us to land. The W. by N. beach sloped more gradually, but the approach was equally dangerous, owing to a number of rocks partially covered by the sea, lying about 100 feet from the beach.

We managed to effect a landing on the southern part of the island by backing the boat in and jumping on a low rocky ledge as we rose to the swell. Having collected specimens of rock near our landing place, we returned to the boat, and pulled round to the smaller island. There was now no snow on the latter, which loked like basaltic rock as far as the cone, which had a reddish brown appearance. About a third of the way up the cone there was a thin

* There may have been some error in the course at this point where the Admiralty chart shows much less than 1000 fathoms.

stratum of grey-coloured stone, which appeared to separate the black basaltic rock from the reddish formation above.

Thousands of birds—Wilson's, brown-backed, and white petrels, prions and cape pigeons—were seen near these islands, the northern end of the larger and the cone of the smaller one being covered with them.

On the following day we had fine clear weather. Good observations for latitude and longitude were obtained, and Lieut. Mulock made a sketch-survey, and took soundings all round the islands. The position of the centre of Scott Island is Lat. 67deg 24½min S., Long. 179deg 55½min E.

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(7) Gerald S. Doorly, op. cit., pp. 59-60.

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(9) Gerald S. Doorly, op. cit., p. 60.

(10) Royal Geographical Society, LBR MSS P/411, Log book of the Terra Nova, January 3, 1904.

ANTARCTIC MEMORIAL SERVICE

A simple but moving memorial service in remembrance of 39 Americans and two New Zealanders who have died in the Antarctic since 1946 was held in Christchurch Cathedral on the morning of October 7, two days before the start of the summer season's operations on the continent. To mark the occasion a bronze plaque was presented to the Mayor of Christchurch (Mr N. G. Pickering) by Captain A. N. Fowler, commander of the United States Antarctic support force, on behalf of the committee which arranged the service.

The plaque, which was placed on an outer wall of the cathedral, bears the inscription: "In memory of those who have given their lives in Antarctica. Their dedication to peaceful scientific research will not be forgotten. Antarctic International Memorial Service, Christchurch Cathedral, 7th October, 1973."

Captain Fowler also presented the city of Christchurch with a gift of seven trees representing the seven oceans of the world. The trees, which already stand planted in the four corners of the centre of the city, Cathedral Square, were given by the United States Navy and the United States Antarctic Research Programme.

The service included readings from Antarctic literature by two New Zealanders, Messrs B. Caygill and K. Cooke, and an American, Commander T. W. Kirkpatrick, of the United States Coast Guard. Passages from Chapter 38 of the Book of Job were read by Captain Fowler, Mr D. Bresnahan, of the United States National Science Fondation, Mr J. A. Cross, president of the New Zealand Antarctic Society, and Mr R. B. Thomson, superintendent, Antarctic Division, Department of Scientific and Industrial Research.

DR. LEWIS ON LAST STAGE OF VOYAGE AROUND ANTARCTICA

Dr David Lewis, the 56-year-old New Zealand-born adventurer, who is attempting to circumnavigate the Antarctic Continent single-handed in his 32ft steel sloop Ice Bird, began the final stage of his voyage this month. He sailed from Palmer Station, the United States base on Anvers Island, off the Antarctic Peninsula, and expects to complete the third leg of his 17,000-mile voyage in May next year.

On January 28 Dr Lewis reached Palmer Station 86 days after he sailed from Halfmoon Bay, Stewart Island. His sloop had been damaged in two storms, and dismasted twice. He decided to postpone the 10,000-mile final stage of his voyage because the Ice Bird needed repairs, and his hands and feet were frostbitten.

This winter ten men at Palmer Station have repaired the Ice Bird as a recreational project in their spare time. They have made a new mast to replace the original which was broken off at deck level, and welded a crack in the side of the cabin.

Dr Lewis left Australia on October 10 for Montevideo where he joined the Royal Research Ship John Biscoe on her voyage to relieve British Antarctic Survey bases off the Antarctic Peninsula. The John Biscoe reached Palmer Station early last month.

Before he sailed from Palmer Station Dr Lewis spent several weeks working on the Ice Bird. He fitted the new mast and a new rail. Spare parts to repair the damaged engine had been shipped from England in the John Biscoe.

Dr Lewis visited other bases off the Antarctic Peninsula after leaving Palmer Station. His last landfall, which he planned to leave in February, was expected to be the Soviet Bellingshasuen Station on King George Island, South Shetlands, or an Argentine base there.

On his eastward course Dr Lewis planned to keep to southern latitudes before turning at the African meridian, and crossing the Indian Ocean in the latitude of Cape Leeuwin, Western Australia. The Ice Bird's first Australian landfall was likely to be the port of Albany in April or early May.

Quartermain Memorial Portrait

A memorial portrait of L. B. Quartermain, one of the foundation members of the New Zealand Antarctic Society, and New Zealand's leading Antarctic historian, will be hung in the Antarctic centre of the new wing of the Canterbury Museum. The Canterbury and Wellington branches of the society have decided to have the portrait painted and presented to the museum in recognition of Mr Quartermain's dedicated interest in Antarctic affairs, his promotion of interest in the continent among New Zealanders and his service to the society for nearly 40 years.

A Wellington artist, Howard Mallitte, has agreed to paint the portrait. He was a friend of Mr Quartermain, and has visited the Antarctic. The painting will be hung in the polar library of the Antarctic centre to which the Quartermain family have made a notable contribution already.

Dr R. S. Duff, director of the Canterbury Museum, announced last month that Mrs Quartermain and her family had agreed to the transfer of Mr Quartermain's library to the centre. The collection of books, scientific publications, newspaper clippings, photographs, and maps, would have a special place in the polar library.

OBITUARY

Bernt Balchen, chief pilot for Byrd and Ellsworth

Bernt Balchen, the stocky, blue-eyed Norwegian-born pilot who flew Rear-Admiral Byrd to the South Pole 44 years ago, died in the United States on October 17. He was 73, and had been an American cititzen since 1931. Clarence Chamberlin, who flew the North Atlantic in the Lindbergh era, once called Balchen the greatest pilot in the world, bar none. His piloting of the three-engined Ford monoplane Floyd Bennett to the Pole and back to Little America on November 29, 1929, has been described as one of the classic achievements in the history of polar exploration by air.

Most of Balchen's polar flying was done in the Arctic. and he made 15 flights over the North Pole. He was a young officer in the Royal Norwegian Naval Air Force when he took part in two Amundsen-Ellsworth expeditions. His uncle, Leif Dietrichson, who made it possible for him to become a naval pilot, was one of the pilots of the two Dornier-Wal flying-boats used by Amundsen and Ellsworth on their unsuccessful North Pole flight in 1925. After Byrd and Floyd Bennett had flown over the North Pole in 1926 Balchen was invited by Byrd to accompany him to the United States.

Balchen worked as a test pilot with three United States aircraft companies, and in 1927 was relief pilot and mechanic for Byrd's attempt to fly from New York to Paris. The aircraft America was fogbound over Paris for three hours with its fuel running dangerously low. Balchen, at the controls, headed the aircraft back to the French coast and made a successful landing in the surf at Ver-sur-Mer.

From 1933 to 1935 Balchen was chief pilot for Lincoln Ellsworth on his two attempts to fly across Antarctica. The flight from the Ross Sea to the Weddell Sea was abandoned after the aircraft Polar Star, moored on an ice floe, was damaged when ice broke up in the Bay of Whales in 1934.

Bad weather prevented any flying from Deception Island when Ellsworth decided to fly from the Weddell Sea side of the continent. On January 3, 1935,

the Polar Star took off from Snow Hill Island but Balchen turned back after flying 400 miles because of bad weather. Later Ellsworth learned that Balchen had decided not to fly with him alone unless the flight was non-stop. Balchen felt that he could not rely on a single man for assistance in the event of a forced landing.

Ellsworth was grievously disappointed at Balchen's decision; it did not lessen his esteem for the Norwegian pilot. When Ellsworth and Hollick-Kenyon finally made the flight, were forced down 16 miles from Little America, and struggled to the base where they remained for nearly a month, "Time" alleged that the two men had silenced their radio to build up publicity. One of the first to defend Ellsworth was Balchen.

AIRMEN RESCUED

After the Ellsworth expedition Balchen reluctantly settled down as chief inspector for Royal Norwegian Airlines. Early in the Second World War he was a ferry pilot for the Royal Air Force, and then an instructor for Norwegians training in Canada. He transferred to the United States Air Force in 1941 and headed a secret expedition to Greenland to establish an air base. In Greenland he made two rescues of airmen marooned on the ice-cap, and led an expedition which destroyed a German weather station and observation post.

In 1944 Balchen headed a secret ferry service of bombers without armament or insignia which carried arms, fuel and food to the Norwegian and Danish underground, and evacuated about 2000 Norwegians to Britain. Many of these flights between Scotland and Sweden were made in bad weather and at low levels. Balchen also helped to repatriate Allied airmen interned in Sweden.

Early in 1946 Colonel Balchen was placed on the reserve list, and returned to civilian life again for a short time in Oslo as operations manager of Royal Norwegian Airlines, the Norwegian element of Scandinavian Airlines Systems. But he asked to be recalled to active duty with the United States Air Force, resigned his post, and returned to the Arctic, serving with the Alaskan Air Command.

Several years ago Balchen went back to the Antarctic. He flew over the South Pole for the second time in 1965, but as a passenger in a Boeing 707 making a flight round the world and over the North and South Poles.

Both Byrd and Ellsworth had the highest regard for Balchen. In "Little America" Byrd refers to Balchen's great loyalty to whatever cause he served, and says: "Bernt Balchen and I have been through much together. He has never failed to meet whatever test has come."

PILOT AND PAINTER

In "Beyond Horizons" Ellsworth quotes Byrd as saying that Balchen could do more things well than any man he ever knew. Ellsworth says his versatility was amazing. He was a good navigator, a pilot with few peers, tireless on skis, and a good cook. Had he chosen a career in art he would have been successful for he could draw and paint like a professional. Ellsworth omitted to mention that Balchen won his first ski championship when he was 14, and was a cycling and boxing champion in his youth.

While Ellsworth had a high regard for Balchen he found him moody and temperamental, and subject to sudden fits of temper on the second voyage to the Antarctic. Ellsworth knew Norwegian polar pilots well; he flew with Riiser-Larsen and Dietrichson in the Arctic. Perhaps, if he had been alive at the time, he could have explained Balchen's claim a year or two ago that Byrd did not reach the North Pole on his flight from Spitzbergen. The statement, made so many years after the event, seemed completely out of character.

Rear-Admiral Charles Thomas, U.S. icebreaker commander

One of the icebreaker captains who played a leading part in the establishment of United States bases in Antarctic for the International Geophysical Year died in March this year. He was Rear-Admiral Charles W. Thomas, who retired from the United States Coast Guard in 1957 after an association with the Antarctic which began nearly 20 years ago.

Admiral Thomas, who was 69, had just returned from the Antarctic Peninsula when he and his wife were killed in a motor-car accident in Ushaia on the island of Tierra del Fuego. He had been serving as an ice pilot and lecturer aboard the tourist cruise ship Lindblad Explorer.

In 1943 Admiral Thomas commanded the cutter Northwind on an expedition to northern Greenland and Jan Mayen Island, his first introduction to polar work. He commanded the icebreaker Eastwind during the Second World War and the Greenland Patrol from 1945 to 1946.

Admiral Thomas went to the Antarctic first during Operations Highjump, the 1946-47 expedition led by Rear-Admiral R. E. Byrd. In the icebreaker Northwind he escorted three ships into the Ross Sea to establish Little America IV in the Bay of Whales. For the I.G.Y. period he was chief of staff of the planning group to provide naval support for the United States expedition.

In 1955 Admiral Thomas was chief of staff of Task Force 43 and later task unit commander of Operation Deep Freeze I. In the icebreaker Eastwind he aided the delivery of cargo to Little America V, explored the coast of Victoria Land, and selected the site for Hallett Station. He was chief staff officer of the group which established Wilkes Station after he had selected the site, and set up Hallett Station early in 1957.

After his retirement Admiral Thomas wrote extensively .on polar navigation, sea pollution, and undersea research. He directed the University of Washington study of Arctic sea ice, served in the Museum of Comparative Zoology at Harvard University, and later was professor of science at Nathaniel Hawthorne College, New Hampshire.

Walter How was seaman and artist aboard Endurance

In the fine biography of Shackleton by Margery and James Fisher there are 26 charming little drawings of incidents aboard the Endurance and the ships concerned with the rescue of the men of the 1914-16 expedition from Elephant Island. The drawings were from the sketch book of Walter Ernest How, an able seaman in the Endurance, whose death last year passed almost unnoticed although he was one of the three survivors of the expedition.

How, described as one of the most level-headed men who lived on Elephant Island for 137 days, was born in Bermondsey on December 25, 1884, and joined the Endurance after much experience in sail off the Labrador coast. He served in the Merchant Navy after he returned from Antarctica, and later was a house decorator until he retired at the age of 70. In 1921 he had a Merchant Navy job ashore, and agreed to join Shackleton's last expedition but his father died not long before the Quest sailed from Plymouth.

The Shackleton biography contains How's sketches of the Nimrod, the Endurance, the Quest. the Yelcho and the Emma, and the lifeboat James Caird, and also the hut on Elephant Island made from the lifeboats Stancomb Wills and Dudley Decker. They supplement Hurley's magnificent pictures of the Endurance at stages of her winter drift. How had a hand in the saving of these pictures; he and Thomas McCarthy, another seaman who sailed with Shackleton to South Georgia, crawled into the hold of the wrecked ship with Hurley and helped him to retrieve from the icy water the three precious tin boxes containing all the photographs, which had been placed in the strong-room.

In later life How advanced from sketching to oil painting. From photographs of ships, specially those of later expeditions, he did oil paintings for members of those expeditions. Despite failing sight in the last ten years he painted the Endurance in the ice and winter quarters on Elephant Island.

Lawrence Bridge served as Scott Base leader

A former soldier and police officer, Lawrence Drake Bridge, who was leader at Scott Base in the 1960-61 summer, and made 14 visits to Antarctica, the last in 1971, died near Wellington on November 4. As a police inspector Bridge was responsible for the national administration of search and rescue operations and the training of the men involved. On his visits to Antarctica he trained many Americans in icecraft, snowcraft, and survival.

Bridge, who was born in Yardley, England, in 1912, was a well-known New Zealand mountain climber and tramper. He spent 22 years of a 25-year military career in the Royal New Zealand Engineers, and retired with the rank of captain. Then for eight years he controlled search and rescue operations for the Police Department. Soon after his second retirement last year he was appointed first field officer of the National Mountain Safety Council.

In the summer of 1960 Bridge was seconded to the Antarctic Division, Department of Scientific and Industrial Research, as leader at Scott Base. He had to return to New Zealand early in 1961 for domestic reasons and was unable to remain in the Antarctic for the winter. His later visits were made during his police service.

An authority on mountain search and rescue, Bridge published a book on the subject, "Mountain Search and Rescue", in 1960. It became a recognised textbook in New Zealand and overseas. Bridge had a long association with New Zealand mountaineering organisations. He was a member of the New Zealand Alpine Club for nearly 30 years, and served on the executive of the Federated Mountain Clubs for 23 years.

"Bill" Bridge, as he was known to everyone who worked with him in Antarctica or in the mountains, died on the job. He was on his way up a creek near Wellington to observe a search and rescue exercise when he collapsed.

BACK ISSUES OF "ANTARCTIC"

Some back issues of "Antarctic" are still available, including several numbers in the first volume of the bulletin. Subscribers who wish to complete their files can obtain back issues from Mrs B. Hale, secretary of the New Zealand Antarctic Society, P.O. Box 1223, Christchurch. Back issues cost $1 in New Zealand currency.

Issues still available are: Volume I, Nos. 4, 5, 6, 7, 10, 11, 12; volume II, Nos. 6, 11, 12; volume III, Nos. 1, 2, 3' 4, 6, 8, 9, 10, 11 12; volume IV, Nos. 1 to 12; volume V Nos. 1 to 12 (except 2); volume VI, Nos. 1, 3, 4, 6, 8, 9, 10, 11.

Last member of expedition to Cape Adare now 99

In 1963 Hugh Blackwall Evans, the last survivor of the ten members of Borchegrevink's Southern Cross Expedition of 1899-1900, who were the first ever to spend a winter on the Antarctic Continent, renewed his subscription to the British Antarctic Club. He was then 89, and he paid ten years in advance. Evans celebrated his 99th birthday on November 19 this year, and is now the oldest living Antarctic explorer, and probably the oldest member of the Antarctic Club.

The birthday of this pioneer of Antarctica exploration did not pass unnoticed in New Zealand or the Antarctic. He received special birthday greetings from Americans and New Zealanders on the continent. The message was signed on their behalf by Mr H. W. E. Jones, leader at Scott Base, and Captain A. N. Fowler, commander of the United States Antarctic support force. With it was an account of the visit to Cape Adare, site of Antarctica's oldest base, last season by Messrs S. Norman and L. K. Cairns, of New Zealand's Antarctic research programme. Birthday greetings were also sent from Christchurch by the New Zealand Antarctic Society.

For many years Evans has lived in retirement in the Canadian town of Alberta, Vermilion ("Antarctic", September, 1970, Pp 466-467). He still takes a lively interest in Arctic and Antarctic affairs. Last year he had a visit from three members of the British Antarctic Survey, and in recent years he has been in two television documentaries, and has been involved in the making of a third about the Southern Cross.

Evans has a family link with the Antarctic expedition of Sir James Clark Ross in the Erebus and Terror in 1839-43. His maternal grandfather was an authority on spiders and a friend of Sir Joseph Dalton Hooker, who was the biologist with the expedition. When he returned from the Antarctic Evans went to see Hooker and talked to him of Scott's planned expedition. On Hooker's advice Evans decided to go to Canada instead of accepting the offer of a post with the expedition.

Another Antarctic veteran who is often forgotten when anniversaries occur is Tryggve Gran, the Norwegian ski expert, who is one of the last three survivors of the shore party of Scott's last expedition. The others are Sir Raymond Priestley, who is 87, and Sir Charles Wright, who is 86.

Gran, who is 84, now has a villa romantically named Capri at Grimstad, Norway, where he lives in retirement. The years have not affected his adventurous spirit; only a year or two ago he was reported to be ski-ing, sailing, and piloting his own aircraft.

Apart from the two Russians, Demetri Gerof, the dog driver, and Anton Omelchenko, the groom, Gran was the one non-British member of the shore party. Although he was only 21 when he joined the expedition, he was probably one of its most travelled members. In March, 1910, he was introduced by Fridtjof Nansen to Scott, who was testing a motor sledge in Norway. Gran demonstrated the correct techniques of ski-ing to Scott, who engaged him to join the expedition. He abandoned his plans for his own Antarctic expedition.

Gran climbed in the Antarctic and New Zealand. He was one of the party which ascended Mt Erebus, and when the Terra Nova returned to Lyttelton in 1913 he climbed Mt Cook with two New Zealand guides, Messrs A. Graham and F. Milne, following the western

face route. The three men spent three-quarters of an hour on the summit, and made the climb to the summit and back in 14 hours 30 minutes.

When he joined Scott's expedition Gran was a sub-lieutenant in the Norwegian Naval Reserve. After the expedition he came to Britain, and was looking for something to do next. He did not have to worry about money; his father had a shipping business. Flying fascinated him, and he decided to attempt the first crossing of the North Sea from Scotland to Norway. He learned to fly, bought an aircraft from Louis Bleriot, the Frenchman who was first to fly the English Channel, and in the summer of 1914 flew from Aberdeen to Norway —the longest flight over water at that time.

In Norway Gran joined his country's air force. When the First World War started he came to Britain and enlisted in the Royal Flying Corps. He was shot down but landed behind the British lines and was wounded twice, awarded the Distinguished Flying Cross, and mentioned in dispatches. Later he planned to make a solo flight across the North Atlantic but Charles Lindberg made the crossing first.

When the Germans invaded Norway in 1940 Gran was put in charge of troops in the north of Norway. He was then serving in the Norwegian Air Force. After the fall of Norway he was imprisoned by the Germans for a few months. Later he was able to save many of his friends both in Norway and Denmark; his acquaintance with Herman Goering after the First World War was useful in dealing with the Nazis.

Gran has been diffident about talking in English about his experiences in the Antarctic. He refused to allow his personal account of the expedition to be translated from the Norwegian and published in English "because it was a British enterprise and I was a foreigner, and it wouldn't be right for me to seem to take away from their glory."

In Norway Gran has lectured to clubs and schools about his experiences. But he does remember some Antarctic incidents in an unusual way. In his garden he has three small cannon. They are used to fire salutes, one to mark the anniversary of his flight across the North Sea, and another to mark his ascent of Mt Erebus. When Sir Raymond Priestley was 80, Gran's guns roared again in honour of his old friend—but only eight times. "Eighty would have made the guns too hot," he said regretfully.

Pool table for Scott Base

Before Christmas Scott Base will have a pool table and equipment, the gift of the Canterbury branch of the New Zealand Antarctic Society. Arrangements have been made by the Antarctic Division, Department of Scientific and Industrial Research, for the table to be flown south from Christchurch by a Royal New Zealand Air Force Hercules aircraft.

Most of the money for the table and equipment has come from the funds of the branch. Contributions have also been made by Christchurch firms and individuals with Antarctic associations.

In addition to the pool table the branch is providing Christmas cheer for all New Zealanders in the Antarctic. It has done this for the last ten years. Field parties and the men at Scott Base and Vanda Station will have home-made fruit cake and biscuits to eat on Christmas Day. And this year New Zealand women will share the Christmas present. There are three working with the field parties.

THE READER WRITES

Sidelights of Antarctic Research

Letters, preferably not longer than 500 to 600 words, are invited from readers who have observed some little-known facet of Antarctic life or have reached conclusions of interest on some Antarctic problem.—Editor.

MATERIAL SOUGHT

2 Gwynfa Avenue,
Christchurch 2,
New Zealand.

Sir,—There is undoubtedly a considerable source of unpublished material among the diaries, letters and writings of those of your readers who have been in Antarctica, especially over the last 16 years. I am not thinking so much of scientific data, but of verse and prose inspired by the continent. If this could be gathered together before it is lost, then perhaps an anthology could be completed.

The activities of the many hundreds of New Zealanders and others who have participated in the New Zealand Antarctic programme over the 16 years since the establishment of Scott Base are part of the history of the region. The participants are historical characters, whether they like to think of themselves as such or not. The scheduled rebuilding of Scott Base will perhaps cause us to pause and reflect on the "end of an era," the closing of an historical passage. The Concise Oxford Dictionary defines "history" in this context as "aggregate of past events, course of human affairs". The late Mr L. B. Quartermain has faithfully and proudly chronicled the activities of New Zealanders, especially in the Ross Sea Dependency, over these years and earlier.

Of course, the voluminous diaries, letters and writings of the earlier explorers and scientists, especially of "the Heroic Era" have been widely published in book form. But no doubt because of the sheer numbers of participants and the quantity of other material which has required and deserved publication (in "Antarctic" and elsewhere), there has not, to my knowledge, been any recent gathering together of the kind of writings I seek.

All contributions will be gratefully received if posted to P.O. Box 5, Christchurch.

Yours etc.,

R. G. McELREA.

ANTARCTIC TELEVISION

20 Browns Road
Christchurch,
New Zealand.

Sir,—It is with dismay that I hear that television has invaded Antarctica, and that its tentacles have even spread to that bastion of hardihood—Scott Base.

I picture the men speeding through their evening meal in order to be sure to get their favourite chair and settle down to the evening's opportunity to cast their minds away from the environment in which they are living. I picture the "mouse" battling to drag himself away from his favourite programme in order to do his regular rounds.

Surely this is not progress, but rather further detraction from the rather special "isolated" atmosphere and opportunity that life at an Antarctic station offers to men and women of enterprise.

In fact, I hope and feel sure, that it is just another amenity which will be put aside in favour of ski-ing, walking, photography, modelling, reading, painting, sledging, work etc.

Yours etc.,

JAMES BARKER

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

The 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 plans to co-operate in securing suitable locations as repositories of Polar material of unique interest.

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$3.00 (or equivalent local currency). Membership fee, including "Antarctic", NZ$5.00.

New Zealand Secretary

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