ANTARCTIC

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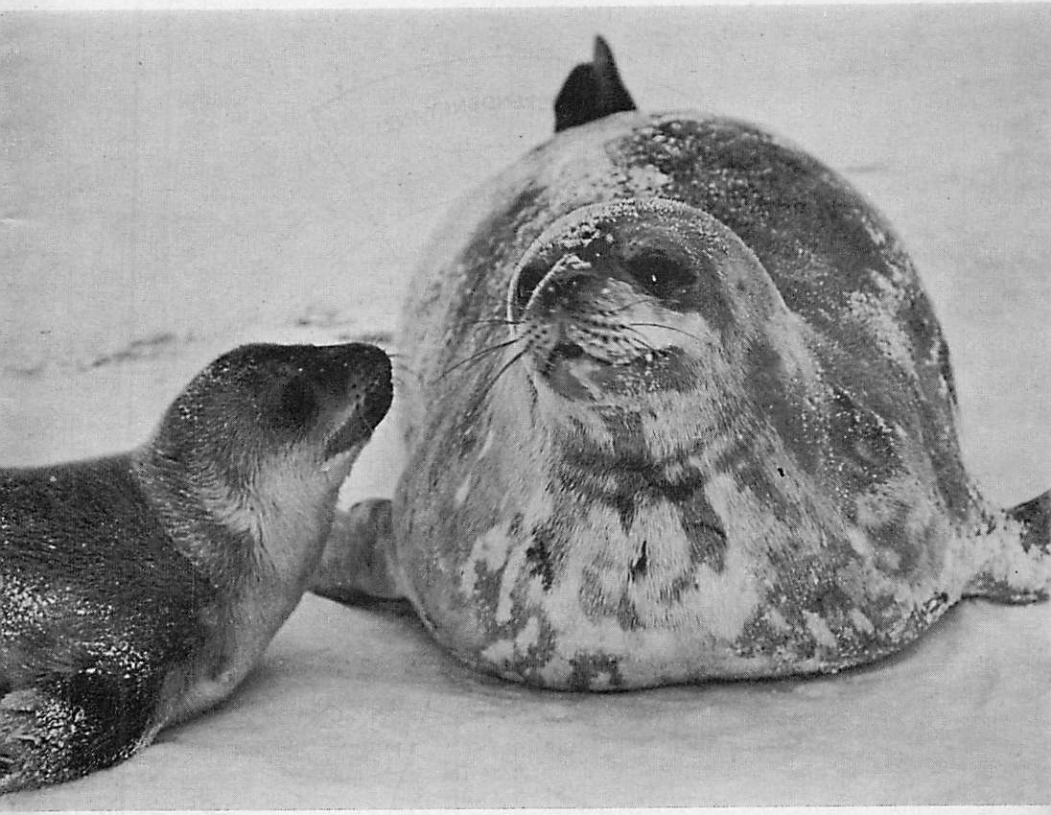
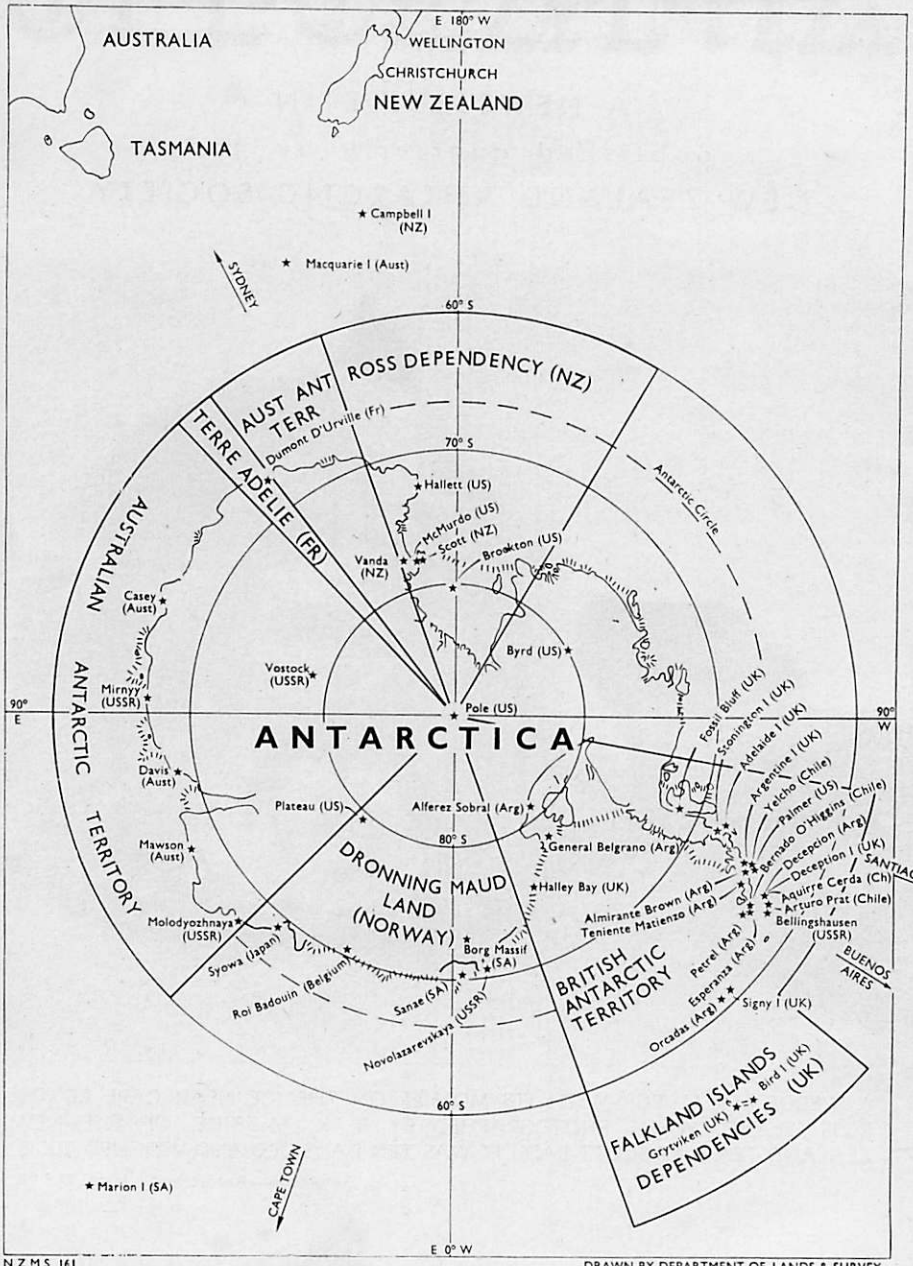


A WEDDELL SEAL PUP WITH ITS MOTHER ON THE ICE NEAR CAPE ROYDS, ROSS ISLAND. WHEN PHOTOGRAPHED BY R. K. McBRIDE, OF THE NEW ZEALAND TEAM AT SCOTT BASE, IT WAS TEN DAYS OLD AND WEIGHED 200lb.

Photo—Antarctic Division, D.S.I.R.

Vol. 6, No. 4 **December 1971**



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"We celebrated Christmas Day, as we were unable to travel [through bad weather] by playing euchre, and by having fried cheese and bacon mixed with horse radish for dinner; and I dare say we enjoyed it much better than many people enjoyed their dinners at home."

Thus wrote Lieut. A. B. Armitage in 1902, when he was a member of a pioneer sledge party on Scott's Discovery expedition. Today, through the miracle of air support, field parties from Antarctic bases can celebrate Christmas Day with the same traditional fare as their friends back home.

To all these people, and the men at the bases we wish "A Merry Christmas."

Arrival Heights record in Project Earthworks

Windswept Arrival Heights, about three miles from Scott Base, and one of the few quiet areas on Ross Island, was the background for one of 15 sets of simultaneous observations made throughout the world as part of Project Earthworks. Organised by Mr P. Dadson, of the Auckland School of Fine Arts, and sponsored by the University of Auckland, the project was designed to provide a tape and photographic record of the passing of the equinoxes.

One of the two times in the year when the sun is at right angles to the earth's axis of rotation, and day and night are the same length at all latitudes except the poles, the equinox was seen by Mr Dadson as a suitable time to record a specific point in earth's rhythms.

Teams of observers, therefore, were asked to take a dozen photographs and to make 10-minute tape recordings at localities ranging from Arrival Heights in the south to Aklavik, Canada, in the north, and from San Diego in the west to Tokyo in the east.

The photographs were to show the physical environment of the recording post, the sky scene, animals and their habitation, people and theirs—just whatever presented itself to the cameras.

On the tapes the observers were asked to record their impressions of the environment in subjective terms, to record the sounds of the environment, and to note meteorological data.

In a circular letter to the teams of observers Mr Dadson said the tapes would be synchronised and mixed on to a master, and the still photographs would be interjected into a film of the New Zealand equinox made at sunrise on the high inland plains south-west of Taupo in the North Island. Then the visual and sound mixes would be combined into a film document.

In the Antarctic, Mr B. Porter, last season's leader at Scott Base, and the senior technical officer, Mr R. Nimmo, spent the night before the observations in a small hut on the site, as otherwise a sudden deterioration in the weather might have made it impossible for them to travel the three miles to Arrival Heights from the base. However, the programme of observations was recorded in near-perfect conditions after a cold and windy night.

OBITUARY

MR J. H. M. WILLIAMS

One of the few honorary life members of the Canterbury branch of the New Zealand Antarctic Society, Mr John Harold Mostyn Williams, died in Christchurch last month. In the ten years before his death he built up one of the finest New Zealand collections of stamps and covers dealing with Antarctic exploration and research.

In 1968 Mr Williams bequeathed his collection, and books about the Antarctic, to the branch. It is now on permanent loan in the Canterbury Museum. On several occasions the collection was exhibited, being sent to Minneapolis in the United States, and appearing at a New Zealand philatelic exhibition in Christchurch.

Mr Williams worked hard in the interests of the Canterbury branch of the society. He was secretary-treasurer from 1961 to 1965, a committee member from 1963 to 1964, and vice-president in 1964. In 1967 he was made an honorary life member.

New Zealand activities to be filmed by Austrian team

New Zealand's scientific programme in the Antarctic this season will be recorded in colour by two noted Austrian documentary film-makers. Mr Rheinhold Materna and his brother, Dr Walter Materna, flew south early in October to spend nearly four months filming at Scott Base, and Vanda Station, in the Wright Dry Valley.

The Materna brothers may shoot as much as 15,000ft of colour film, using movie and still cameras. Their film, which may be shown on television in a dozen or more countries, has the support of the Antarctic Division of the Department of Scientific and Industrial Research, which has wanted to do such a project for some time.

In Wellington last year Mr Materna discussed with the division's superintendent, Mr R. B. Thomson, the idea of doing a film on the people who go down to the ice, why they go south, and how they spend each day in the Antarctic. The New Zealanders at Scott Base will be subjects in a general film on Antarctica, which will also include one day in the life of a man at the base.

Mr Materna, his wife, and his elder brother, who usually stays at home to do the research for their films, have an international reputation as makers of documentary films. Their work has won the Council of Europe prize for the best documentary—one on Iceland—and they gained first prize at the seventh international film festival at Teheran last year, in competition with 65 other entries.

In 1969 Mr and Mrs Materna spent 10 months filming the primitive people of the New Guinea highlands. Other documentaries they have made are "Benares, the Holy City," and "The Forgotten Coast: East Greenland."

FIRST SLEDGE TRIP

Travel by dog sledge was a new experience for the Materna brothers last month after the jungles of New Guinea. They were taken from Scott Base to Cape Evans by the dog handlers, Messrs M. Riding and J. H. Bull. Two sledges and 18 huskies were used, and the party visited Scott's hut and the Barne Glacier.

Quakes May be Ice Movements

New Zealand has two seismograph stations in the Antarctic, one at Scott Base and the other at Vanda Station, about 120 kilometres west-north-west of the base.

After the installation of a high-gain vertical seismograph at Vanda numerous shocks of a magnitude up to 3½ were located near the coast of Victoria Land in the region of the Drygalski Ice Tongue, from observations at both Vanda and Scott Base.

In the New Zealand national report to the International Association of Seismology and Physics of the Earth's Interior, prepared by Mr M. J. Randall, of the Seismological Observatory, Geophysics Division, Department of Scientific and Industrial Research, it is suggested that these shocks, because of their magnitude-frequency relationship, were not natural earthquakes, but were caused by movements in the ice-field.

No natural tectonic earthquake has yet been unequivocally located in the Antarctic Continent, according to Mr Randall. His report was presented to the assembly of the International Union of Geodesy and Geophysics in Moscow last month.

TRANS-ANTARCTIC OTTER STILL FLIES IN CANADA

It came from Canada nearly 15 years ago and it is back in Canada—still flying. The first single-engined aircraft to fly across the Antarctic Continent from South Ice over the South Pole to Scott Base on January 6, 1958, is now being operated from the industrial airport at Edmonton, Alberta, by Le Range Aviation Services Ltd.

Built in Canada, the de Havilland Otter was flown to England via Greenland and Iceland, and then used as a transport and reconnaissance support aircraft by the British component of the Commonwealth Trans-Antarctic Expedition of 1957-58. After Sir Vivian Fuchs and his party had left South Ice for the South Pole Squadron Leader John Lewis made an 11-hour flight of 1450 miles over the Pole to Scott Base.

When the Antarctic crossing ended the Otter remained at McMurdo Station. It was bought by the United States naval support force, and flown by pilots of VX6 Squadron. Otter aircraft had been used during the early years of Operation Deepfreeze.

Eventually the Otter was bought by the Royal New Zealand Air Force. It was shipped to Wellington, and reconditioned and repainted at the de Havilland factory at Rongotai airport.

Then the Government Stores Board called tenders for the purchase of the historic aircraft which had not been taken into service by the R.N.Z.A.F. It was bought by a small Canadian airline, Georgian Bay Airways, and went into commercial service in Ontario.

Originally the Otter was XL710 of the Commonwealth Trans-Antarctic Expedition. Then it was ZK-CFH and Bul47570 (U.S. Navy registration). It was NZ6081 while at Rongotai, and now it is registered as CF-PNV.

SEA LABORATORY AT CAPE BIRD

A sea laboratory is being built at Cape Bird this summer by the Antarctic Division of the Department of Scientific and Industrial Research for the University of Canterbury's Antarctic research unit. The university maintains a summer research laboratory at Cape Bird for its marine biology studies.

By pumping sea water through tanks in the beach laboratory, research staff will be able to observe live samplings of marine life in their own natural environment. Although semi-permanent the sea laboratory is designed to be moved from site to site as the need arises.

CARETAKERS AT CAPE ROYDS

Two Antarctic caretakers left Christchurch early this month to work for three weeks at Cape Royds and Cape Evans. They are Mr H. Burson, a 27-year-old Post Office draughtsman, and Mr R. G. McElrea, a 28-year-old Christchurch lawyer. Both are members of the Canterbury branch of the New Zealand Antarctic Society.

This is the third successive season that members of the society have gone south to act as caretakers. Messrs Burson and McElrea, who were selected from 12 applicants for the post, will make primary meteorological observations, and do maintenance work at the historic huts at Cape Evans, Cape Royds, and Hut Point. They will also take care of the areas round the huts at Cape Evans and Cape Royds, and see that the Adelie penguin rookeries are not disturbed by parties of summer visitors.

HISTORIC HUT AT CAPE ADARE

After almost 72 years of exposure to high winds and blizzards on desolate Ridley Beach at Cape Adare, the hut built by Carstens Borchgrevink's expedition—the first men to winter on the Antarctic Continent—is still standing. New Zealand, which has a responsibility under the Antarctic Treaty to preserve what have been designated "historic vestiges," now plans to restore the hut, possibly next season.

There are other buildings on Ridley Beach. Next to the hut is a stores building, now roofless, used by the expedition in 1899. To the left is another hut built in 1911 by the northern party of Scott's last expedition. This party, led by Lieutenant Victor Campbell, later spent a miserable winter in a snow cave at Terra Nova Bay.

Another "historic vestige" at Cape Adare is the grave of Nicolai Hanson, the expedition's senior zoologist, who was the first man known to have died in Antarctica. Hanson was buried at the foot of a big boulder 1000ft up on Cape Adare.

Because of the difficulty of access to the huts—landings at Cape Adare can be made only from a ship—they have not been inspected since 1964 when a New Zealand magnetic survey party visited Ridley Beach. To obtain some idea of the condition of the huts a United States Navy Hercules which landed a New Zealand Antarctic Research Programme team on the Evans Neve in Northern Victoria Land flew over the Cape Adare area late last month.

Mr R. B. Thomson, superintendent of the Antarctic Division, Department of Scientific and Industrial Research, says that photographs taken by the Scott Base photographer, Mr R. K. McBride, of Blenheim, indicate that the huts have not changed in seven years. It is hoped to retain at least one hut—probably Borchgrevink's main hut—which will be restored with materials available.

ANTARCTIC SOCIETY TIES READY

Industrial and shipping difficulties beyond the control of the manufacturers delayed the production of fresh stocks of the New Zealand Antarctic Society's tie, but they are now available. Members can obtain their ties from the secretaries of the Canterbury and Wellington branches. The cost is $3.50, and postage is 8c extra.

Overseas members are asked to remit payment, plus postage, in New Zealand currency or its equivalent net value. Ties will be sent by air mail on request only. Second-class air mail rates are: Britain, 40 cents; United States, 28 cents; Australia, 16 cents. Members who send ties overseas by second-class air mail should post them in an unsealed envelope which can be tied with string.

CARVED PENGUIN TROPHY

A miniature Emperor penguin carved from African walnut will be awarded annually by the Canterbury branch of the New Zealand Antarctic Society as recognition of conservation work in the Antarctic. The trophy has been given by a member, Mr P. I. Voyce, to make people aware of the unspoiled nature of Antarctica, and to encourage them to preserve it for future generations.

About 17in high, the trophy was carved by one of New Zealand's leading wood carvers, Mr P. M. Mulcahy. To ensure that every detail was correct he used as a model the stuffed Emperor penguin which stands in the foyer of the office of the Antarctic Division, D.S.I.R., in Christchurch.

The penguin will be housed permanently in the proposed Antarctic wing of the Canterbury Museum; recipients of the award, for which all New Zealand citizens are eligible, will receive a certificate.

N.Z. BEEF AND LAMB ON ICE

New Zealand is the first and only country to export meat under contract to the Antarctic. The United States Antarctic naval support force has ordered about 32 tons of beef from the Canterbury Frozen Meat Company for its bases in the Antarctic, and the advance headquarters in Christchurch.

Last season a rush order for seven tons of T-bone and Swiss steaks and slab bacon was filled by the company, and flown south to McMurdo Station just before the season ended. This summer American servicemen and scientists will be provided with T-bone steaks, porterhouse steaks, grilling steaks, pot roasts, mince meat, and corned beef.

Hundreds of Americans will also have their first taste of New Zealand lamb. A trial shipment of nearly a ton will be supplied by the Canterbury Frozen Meat Company. The Americans will be shown how to prepare cuts and cook the lamb, and recipes will be sent to McMurdo Station before the meat is flown south.

New Zealand lamb has been on the menu at McMurdo Station before. About ten years ago the New Zealand Meat Board made a gift of lamb to the support force. It was well cooked but some New Zealanders who ate it still remember that it was served with apple sauce instead of mint sauce. They also had lamb at Scott Base, but there it was accompanied by roast potatoes and the traditional mint sauce.

The contract for the supply of beef is for one season. It has been awarded under the "key buy programme" in which the support force is authorised to buy a larger proportion of its needs locally.

No Tourist Flights

Air New Zealand has apparently shelved its plans for tourist flights from New Zealand to the Antarctic. Its latest annual report says that any serious planning for an operation to the Antarctic has been postponed in the meantime because of the need for buildings and surface transport to serve tourists taken south.

Once again Air New Zealand says that such a service is operationally practical. It determined for itself in the 1969-70 season that there were no technical and flying difficulties. Then late last year ("Antarctic", Vol. 5, No. 12, December, 1970) it decided that a commercial service was at least two summers away as adequate transit accommodation for passengers at Williams Field in McMurdo Sound would not be available until the summer of 1972-73.

Test of unmanned observatory

An automatic, unmanned, geophysical observatory will be erected at Arrival Heights, near McMurdo Station, this summer. Next winter it will be tested to prove the suitability of two types of electric power generating equipment for cold environment operation.

Developed at Stanford University, California, with support from the National Science Foundation, the observatory was given mechanical and structural tests at Byrd Station last winter. It is made up of a cylindrical aluminium instrument capsule about 6ft high, an 8ft dish antenna for a satellite communication link, a tubular tripod mount, and telemetry equipment.

The instruments will obtain scientific information and transmit the data to the United States. This will be done by radio, communications being relayed by a synchronous satellite over Hawaii to a receiving centre in California.

The Arrival Heights site for the observatory is on the edge of precipitous cliffs facing north. It is about two miles north of Scott Base, and a slightly lesser distance from McMurdo Station.

WHALE CATCH LIMIT REDUCED BY COMMISSION

A reduction in the pelagic catch limit for the 1971-72 Antarctic whaling season has been made by the International Whaling Commission. The limit has been set at 2,300 blue whale units, 400 blue whale units less than the limit set for the previous season.

One blue whale unit equals one blue whale, two fin whales or six sei whales. For 1972-73 member countries have agreed that the blue whale unit, as a means of expressing catch limits, will be superseded by limits by species.

Six expeditions operating in the Antarctic in 1970-71 caught 2,890 fin whales and 6,153 sei whales (equivalent to 2,470 blue whale units). In addition the expeditions caught 2,745 sperm whales.

In the 1969-70 season seven expeditions caught 3,001 fin whales and 5,856 sei whales (equivalent to 2,477 blue whale units). They also took 3,090 sperm whales.

Total production of baleen and sperm oil from the 1970-71 Antarctic pelagic season amount to 470,287 barrels. The 1969-70 catch produced 461,285 barrels.

The commission considered a report by the scientific committee on the maximum sustainable yield of fin and sei whales in the whole of the Antarctic area. The committee had been unable to present an agreed figure of the maximum sustainable yield of fin whales but for sei whales it estimated the sustainable yield as 5,000.

Minke whale stocks in the Antarctic were also considered by the commission, which decided that a careful watch should be kept on the level of the catch. Preliminary estimates indicated that the population was between 150,000 and 200,000, and the maximum sustainable yield was 5,000.

Provision has been made by the commission for member countries to place observers on factory ships and land stations or groups of land stations of other member countries. The observers will be appointed by the commission and paid by the governments nominating them.

Present at the commission's meeting in Washington were delegates from Argentina, Australia, Canada, France, Iceland, Japan, Mexico, Norway, Panama, South Africa, the Union of Soviet Socialist Republics, the United Kingdom, and the United States. Also present were observers representing the Brazilian, Italian, and New Zealand governments, the Food and Agriculture Organisation, Fauna Preservation Society, Friends of the Earth, International Council for the Exploration of the Sea, International Society for the Protection of Animals, International Union for the Conservation of Nature and Natural Resources, and the World Wildlife Fund.

55 MILES OVER SEA ICE

A 55-mile journey over the sea ice of McMurdo Sound from Scott Base to Marble Point was made early last month by the deputy leader and the base mechanic, Messrs B. Jefferies and L. McGhie. They used a Nodwell tracked vehicle and towed a sledge loaded with drums of petrol and diesel fuel for Vanda Station in the Wright Valley.

From Marble Point the fuel was ferried by United States Navy helicopter to Vanda Station for use in vehicles and generators this summer. It travelled to its destination more speedily than on the first stage of the journey when the heavy load kept the Nodwell's speed down to about seven miles an hour.

Australian survey includes Prince Charles Mountains

Extension of a geodetic control survey in the southernmost region of the Prince Charles Mountains with full air support by three helicopters and one aircraft is included in the 1971-72 summer exploration programme of the Australian National Antarctic Research Expedition. In the station programmes for next year is the installation of cosmic ray astronomy equipment in a new underground laboratory and vault excavated from the rock site of Mawson Station.

Annual relief programmes began last month when the Nella Dan made the return voyage from Melbourne to relieve Macquarie Island. She left Melbourne early this month to relieve Davis and Mawson, and is expected to return about March 13 next year.

Aircraft for the summer exploration programme in the Prince Charles Mountains will be carried aboard the Nella Dan, which will travel from Antarctica to Fremantle at the end of January to pick up members of the expedition. Relief support will be provided by three Hughes 500 helicopters and one Pilatus Turbo-Porter fixed-wing aircraft.

The Thala Dan will leave Melbourne about January 5 for the relief of Casey. She will carry two Hughes 500 helicopters to provide air support during the relief of the station, and for a visit to Macquarie Island on the return voyage which is expected to end about February 15.

SUMMER EXPLORATION

Base camps for the geodetic control survey in the Prince Charles Mountains will be established at Moore Pyramid and Mount Cresswell (360 miles south of Mawson). The work will also include the establishment of markers at selected locations for investigations by glaciologists, covering barometric levels, snow sampling, and gravity measurements. If possible there will be some work in geophysics, geology, and biology.

In 1972 there will be an autumn depot trip of 150 miles from Mawson to Mount Twintop late in February or early in March. The spring depot trip to Mount Cresswell should leave early in October.

At Casey the glaciologists will move into the field to set up drill equipment at various points on the western and eastern legs of the survey triangle, and up to 60 miles from the station. At Davis field trips will be mainly for biological surveys, and not far from the station.

STATION WORK

Long-term programmes in upper atmosphere physics, cosmic ray studies, meteorology, seismology, geomagnetism, and medical science will be continued. In addition some special programmes, mainly in geology, glaciology, and biology, are planned.

Mawson.—Excavation of the rock for the underground laboratory and vault this year was a virtual mining operation. In addition to the installation of the cosmic ray astronomy equipment there will be a glaciological programme in the Lambert Basin—southern Prince Charles Mountains area. This is designed to establish the total mass flow of ice across the 6600ft contour into the Lambert Glacier drainage basin.

The biology programme includes the establishment of a biological laboratory. In marine biology there will be studies of the composition of the sea water in Mawson Harbour, particularly the salinity, mineral nutrients, oxygen content, light and productivity. Phyto and zooplankton will be observed and collected. Surface currents will be determined within a one-mile radius of the station.

There will also be a biological survey on all the islands near Mawson, and censuses of Emperor penguin rookeries. Ecto-parasites will be studied and collected. There will be an aerial count of seals in the pack ice during the summer stay of the relief ship.

Davis.—Biological surveys will be made of the Vestfold Hills and islands near the station during the summer. Throughout the year weekly counts of elephant seals will be made. There will also be studies of the population and distribution of Weddell seals and Adelie penguins.

Casey.—When parties are changed the biological observations will relate to silver-grey petrels, Antarctic petrels and giant petrels.

Macquarie Island.—A geological and geophysical research project is being conducted jointly by the University of Tasmania and the University of New South Wales to study the structure and origin of the island. This started when the parties were changed.

The biological programme includes work on giant petrels, light-mouthed sooty albatrosses, and elephant seals. Collections will be made from the island's lakes for limnology studies.

Rabbit control research is being continued, particularly on the effects of the parasitic European rabbit flea liberated earlier on the island. Botanical studies include observations of the effects of rabbit grazing on the vegetation, and seed collections.

Shackleton Medal to mark death

A special commemorative medal to mark the 50th anniversary of the death of Sir Ernest Shackleton aboard the Quest at Grytviken, South George, on January 5, 1922, has been minted by the Crown Agents, who are responsible for the administration of Britain's Antarctic territories.

Sir Vivian Fuchs, director of the British Antarctic Survey, presented the first medal to Lord Shackleton, president of the Royal Geographic Society, and the son of Sir Ernest Shackleton, at a ceremony aboard the Discovery.

Money from the sale of the medals—they cost £8 each, and 10,000 have been minted for sale to the public—will be used by the B.A.S. to help finance scientific work.

Macquarie Island gardener

Vegetables will be grown at the Australian station on Macquarie Island this season—in water with the aid of fertilisers. The gardener is Dr. J. Henson, a 62-year-old retired Sydney doctor, who has studied hydroponics and grown plants extensively in water instead of soil.

Dr. Henson, who retired recently from the New South Wales Health Department, made a last-minute decision to join the Macquarie Island party when the Antarctic Division of the Department of Supply was seeking doctors for its stations. He offered to experiment in growing vegetables in pots of water with fertiliser, and the department accepted his offer.

There is a fresh vegetable growing on Macquarie Island already—Stilbocarpa polaris, locally known as Maori cabbage. It is edible, though somewhat stringy and insipid. The five members of Mawson's 1911-1914 Antarctic expedition, who spent two years on the island, were on short commons towards the end of their stay but do not mention having added Maori cabbage to the menu. But the 12 live sheep landed by the Aurora for their use ate it readily.

First outside study of American support costs

The National Science Foundation has no idea at present of transferring the main Antarctic support base at McMurdo Station to Marble Point, the rocky promontory about 50 miles from Ross Island on the western side of McMurdo Sound. This season the Bechtel Organisation, one of the world's leading engineering, construction, and management services firms, will make an over-all cost effectiveness study of the whole Antarctic support operation; but the Marble Point proposal occupies only 25 per cent of the operation.

When the Bechtel team arrived in Christchurch on its way south, Mr W. T. Austin, the N.S.F. associate programme manager for field operations, explained exactly what the study of Antarctic support costs involved. He made it clear that the consultant's study was regarded purely as a management tool, and any information or recommendations in its report would not be effective for four or five years at the earliest.

Those responsible for the National Science Foundation budget, which is about $20 million annually, considered that the entire operation should be looked at. Costing studies in relation to the Antarctic operation have been done by the foundation and the United States Navy, but the Bechtel operation will be the first outside study.

The consultant's report is to be completed by next March, and the National Science Foundation could take another six months before it decides on any recommendations in the report. Then the decisions will have to be related to the successive annual financial allocations.

It is possible that a base and a year-round runway might be recommended for Marble Point, according to Mr Austin. Again it might be found more economical to remain at McMurdo Station. There could also be the possibility that there might be merit in having facilities at both sites.

As the National Science Foundation is responsible for the financing and management of all American activities, it is interested in any savings on its annual budget. Mr Austin emphasised that the achievement of a saving of 15 per cent over, say, a 10-year period, would be quite useful.

Mild winter and snow storm

Scott Base had a relatively mild winter this year; the worst weather was experienced shortly before the winter team returned to New Zealand. A storm over the Ross Ice Shelf left snow drifted up to 10ft deep round the huts and buried the covered way in places.

The lowest temperature recorded at the base during the winter was minus 53.9deg C. and the maximum was plus 5deg. The strongest wind was 76 knots.

Because of the mild weather the winter team did not have to use a tracked vehicle when they visited McMurdo Station. A utility vehicle was able to use the road without difficulty. There were more visits than usual to the American neighbours because about half the team had to obtain dental treatment.

One job the winter party left behind them—clearing the heavy accumulation of snow. It was the first big task for the new season's team which took over officially on October 12.

U.S. AND PRIVATE VENTURES

There is nothing in the Antarctic Treaty or in United States policy to prohibit such private ventures there as expeditions or aircraft flights. The United States considers Antarctica an open continent.

These comments were made in Christchurch this month by Mr Addison Richmond, an executive secretary of the Antarctic Policy Group in Washington, and an officer of the State Department's Bureau of Scientific and Technological Affairs, which is responsible for Antarctic affairs. The director of the Bureau is chairman of the Antarctic Policy Group, and Mr Richmond is chairman of the inter-agency committee on Antarctic.

Mr Richmond explained that the group did not have a prohibitory policy in respect of private ventures, but it would not like to see any ill-conceived venture start. There was nothing in the Antarctic Treaty or United States policy which would prevent any persons who had their own finance and were fully self-sufficient from going to the Antarctic whether the group liked it or not, If a reasonable, coherent plan was presented, and there was a reasonable possibility that a venture could be performed successfully, the group was willing to take the risk that something unforeseen might prevent the completion of the mission.

Safety and the use of United States facilities are two major concerns of the Antarctic Policy Group when it considers private ventures in the Antarctic. Requests for logistic support, transport, and accommodation, are legitimate matters for Government consideration, according to Mr Richmond. The group is interested in safety for humanitarian reasons, and because there would be a drain on scarce resources if an ill-conceived venture got into difficulties.

POLE WINTER TEAM RELIEVED

Twenty-one men at the Amundsen-Scott South Pole Station had fresh food to eat and letters from home to read for the first time in more than eight months when a United States Navy ski-equipped Hercules landed at the station on October 27. The last flight from McMurdo Station to the Pole was made on February 15.

On the first flight of the season to the Pole Station the Hercules brought eight summer replacement staff as well as the mail and fresh food. It remained at the station for one hour 27 minutes before taking off with 14 sailors and seven scientists who had spent the winter at the Pole.

Date extended for philatelic mail

About 30,000 special envelopes sent by stamp collectors for cancellation at McMurdo and Pole Stations did not reach Antarctica because they were cancelled by mistake and mailed from San Francisco. To enable collectors to have their covers cancelled at the two stations the deadline for posting has been extended to January 1.

Covers must carry United States postage at the domestic letter rate or an international reply coupon must be provided. Collectors are limited to one cover for each station and should send the covers to Commander, Antarctic Support Activities, McMurdo Station, F.P.O. San Francisco, 96692.

Stamp collectors can also have special covers cancelled aboard the three United States Coast Guard ice-breakers taking part in Antarctic activities this season.

The addresses for these are: U.S.C.G.C. Staten Island (WAGB-278), F.P.O. Seattle, 98799; U.S.C.G.C. Southwind (WAGB-280), F.P.O. New York, 09501; U.S.C.G.C. Northwind (WAGB-282), F.P.O. Seattle, 98799.

SNOWMOBILE JOURNEY TO THE SOUTH POLE

An American engineer, Mr Walter Pederson, has been granted permission to make a snowmobile journey to the South Pole from McMurdo Station. The Antarctic Policy Group in Washington, which twice declined his application to make the journey, has approved plans, but imposed certain conditions.

Mr Pederson, a member of the snowmobile expedition which reached the North Pole on April 19, 1968, cancelled his proposed journey last summer because of lack of planning and the latest of the season. He came to Christchurch, and after five days returned home to Minnesota, leaving five snowmobiles, radio equipment, and clothing in storage.

Since then there have been so many conflicting reports about Mr Pederson's plans that it is difficult to say what he intends to do. The latest report was that he planned to fly to New Zealand this month, and start his journey some time after December 15.

In his latest application to the Antarctic Policy Group Mr Pederson said he planned to fly his equipment south in a Hercules chartered from an Alaskan airline, and use a ski-equipped Beaver for support work. When he came to Christchurch last month to discuss his plans with the Antarctic naval support force he said that his deputy leader would be Mr R. A. Lenton, of the Arctic Institute of North America, who was the radio operator with Sir Vivian Fuchs on his trans-Antarctic crossing in 1957-58. Others in the party would be Professor G. Johnson (navigator) and Mr R. Mickelson (cameraman).

Since then Mr Pedeson has asked the Antarctic Policy Group for permission to fly to McMurdo Station by way of South America, using a ski-equipped Twin Otter aircraft obtained from another Alaskan airline. Because of the limited range of the aircraft, even with extra fuel tanks, it would have to land at Adelaide Island, off the Antarctic Peninsula, and Byrd Station. Mr Pederson has not indicated whether he will still use a Hercules to transport his equipment.

Mr Pederson has been granted permission to use American facilities in the Antarctic, but Rear Admiral L. B. McCuddin, the support force commander, can call off the expedition at any time if he decides that conditions for it are unsafe. Any assistance given by military aircraft will be charged for at commercial rates, and the expedition and its equipment can be returned from the South Pole to McMurdo Station by American aircraft on a space available basis.

U.S. Navy Hercules abandoned

A United States Navy Hercules has been abandoned to the elements in Wilkes Land about 750 miles from McMurdo Station. It crashed on December 4 after a supply mission to a French scientific traverse party which had reached a point 125 miles from the Adelie Land base at Carrefour, southwest of Dumont d'Urville.

The 3.5 million dollar aircraft was damaged during a jet-assisted take-off when two jato bottles broke loose from their fittings, tearing off one propeller and damaging another. It has since been stripped of all usable parts. There are now only three Hercules aircraft available for inland support missions, one of which is reserved for search and rescue work. Unless a replacement can be obtained some scientific projects may have to be given lower priority this season.

BIGGER ICE-BREAKERS FOR AMERICA AND RUSSIA

Both the United States and the U.S.S.R. are building bigger and more powerful ice-breakers. The U.S.S.R. has two 25,000-ton nuclear-powered ships of the Arktika class under construction. They will each carry 10 helicopters and have a speed of 25 knots.

In the United States the Coast Guard has ordered a new 12,000-ton ice-breaker which is expected to be in service by 1974. A $US52,681,485 contract has been let to build the ship, which will be the first of four to replace the Wind class ships.

The new American ice-breaker, as yet unnamed, will be the first built since 1954. Its icebreaking capability with diesel power alone will exceed that of the largest American icebreaker Glacier, a familiar sight in Antarctic waters. With its gas turbines operating its available shaft horsepower will exceed that of any ice-breaker afloat, including the Soviet nuclear-powered Lenin.

Coast Guard engineers have designed a new power unit for the ship—conventional diesel engines for normal cruising and gas turbines for situations where maximum power is required. It will have a novel hull shape, stronger hull structure, special steering innovations, an oceanographic system with a portable laboratory and data transmission systems, and greatly improved living quarters for the crew.

The ship's maximum cruising range at 13 knots will be 28,275 miles—more than the distance round the earth at the equator. It will be capable of a sustained sea speed of 17 knots.

The ice-breaker will be able to advance through 6ft ice at a steady three knots and to ram its way through ice 21ft thick. It will carry two Sikorsky amphibious helicopters, 138 officers and men, and 10 scientists.

U.S. SERVICEMAN'S DEATH

A 39-year-old United States serviceman died at McMurdo Station on October 11 less than 48 hours after he arrived from New Zealand. Chief Aviation Machinist's Mate William Decker, who had 21 years service in the Navy, is believed to be the first man to have died of natural causes since the United States began its Antarctic programme. Decker died in his sleep from an apparent heart attack. His body was flown to the United States for burial.

Science foundation Director named

Dr H. G. Stever, president of Carnegie-Mellon University, Pittsburg, since 1965, has been named by President Nixon as the new director of the National Science Foundation, which is now responsible for the financing and management of all American activities in the Antarctic. He will succeed Dr W. D. McElroy at the beginning of February next year.

Nationally known for his work in aeronautical engineering and space technology at Massachusetts Institute of Technology where he served on the faculty for more than 20 years, Dr Stever is 55. He was educated at Colgate University and the California Institute of Technology, and is a member of the National Science Board and the advisory panel to the House of Representatives on science and astronautics. In addition he has served as chief scientist with the United States Air Force, and has headed several aeronautical and scientific advisory committees at the Federal Government level.

British Antarctic Survey News

Lack of sea-ice on the western side of the Antarctic Peninsula, coupled with strong winds and low temperatures have hindered the work of survey parties this season. Difficult overland routes have had to be used, but to date much useful work has been accomplished.

Travel from several bases has been restricted during the past few months by a series of gales which prevented the consolidation of sea ice down the west coast of the Antarctic Peninsula and in the South Orkneys. In the South Orkneys a party which sledged over to Coronation Island from Signy Island, had to await the arrival of a dinghy to take them back to base.

South Georgia, which is not dependent on sea-ice travel, was more fortunate; August was blustery, but the whole of September and much of October were sunny and mild and various outdoor activities, including biological projects, continued unhampered.

At the Argentine Islands, off the west coast of the peninsula, journeys between the islands and the mainland were almost impossible this year. Further south, in Marguerite Bay, where the sea-ice does not normally clear until much later, difficult overland routes have had to be used.

Four men who spent part of the winter working from the old Horseshoe Island base, only just managed to get back to the mainland when the sea-ice broke up in August. Their usual route up the Forbes Glacier ice cliff had also broken off, and it took them several hours to haul their sledges and dogs up before they were able to set off for Stonington Island overland.

PLATEAU DEPOT

As sea-ice travel was impossible, much of August was spent in preparing for overland travel by establishing an 8-ton depot 5000ft. up on the plateau above Stonington Island. Progress, which is never easy on this steep slope, was slowed down further by persistent strong winds and temperatures down to –30°C. which produced rock-hard sastrugi 2ft. high, but the depot was completed in time for several sledge parties to set off for the south at the beginning of September.

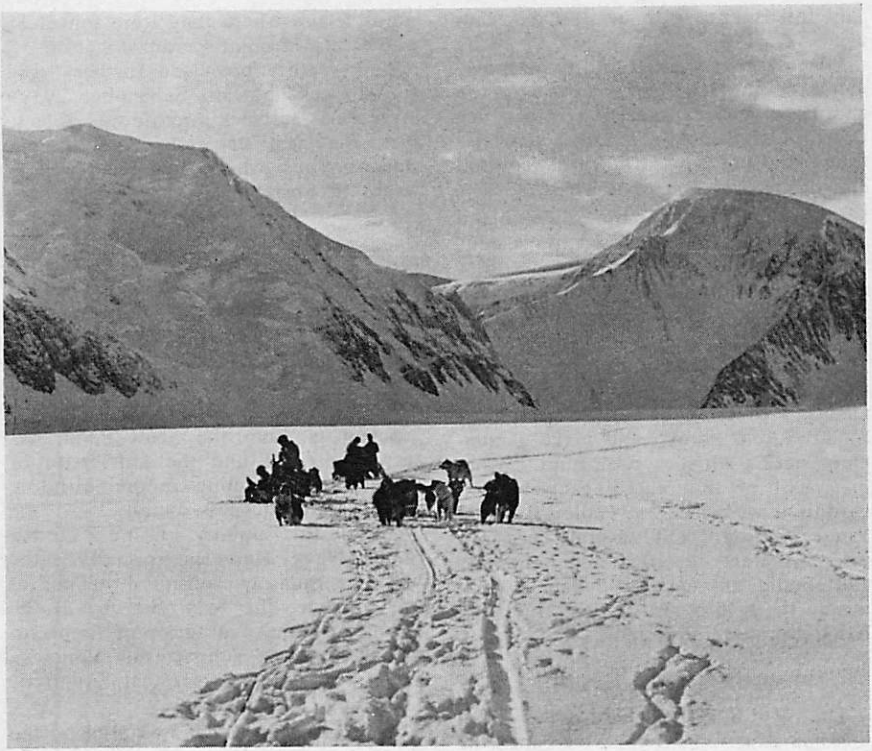
A survey party of four men heading for the Mt. Duemler area (70°01′ S., 60°45′ W.) varied the standard route south by travelling much of the 280 miles down the Larsen Ice Shelf on the east side of the peninsula. They had twenty-six days of superb clear cold weather with excellent surfaces on which the dog teams ran well with 900lb. loads.

But when they arrived at Mt. Duemler they found that more than half of the dog food (50 60lb. boxes) and some other stores had been blown away from their depot. A thorough search over three square miles revealed only a few luxury items—including one tin of herrings 5ft. down. As there was only enough food for half the dogs the party then split up, two men travelling north to start work on the Engel Peaks, while the other two set off west to collect supplies from a depot at Carse Point (70° 13′ S.) in George VI Sound.

GALES AND SNOW

Other parties of surveyors and geologists from Stonington Island worked on the Wordie Ice Shelf and the mountains east and south of it, but were hampered by bad weather and deep new snow. One party lost all its survey gear and some of its food when a gale destroyed a depot. (This gale also caused some damage at Stonington Island.)

The party then rendezvoused with



A British Antarctic Survey sledging party on the upper part of the North-east Glacier. This is on the route from Stonington to the Polar Plateau.

British Antarctic Survey Photo

other parties at Carse Point and travelled up the nearby Chapman Glacier to establish the eastern end of a survey line to be measured across the sound.

Meanwhile, three glaciologists, one of whom had been flown to Fossil Bluff when two sick men were evacuated, travelled by tractor to the southern end of George VI Sound to re-survey the glaciological scheme which was initiated two years ago. This scheme consists of pits 3 metres deep, 10-metre bore-holes and marker stakes carried on across the sound.

The party then carried supplies from Fossil Bluff to the Carse Point rendezvous, and later travelled on into northern Alexander Island to establish the western end of the survey line across the sound.

At the same time, a geophysics party from Stonington Island travelled to Fossil Bluff and then set out for northern Alexander Island via Carse Point. Poor surfaces and trouble with the magnetometer forced the party to return to Fossil Bluff but subsequently it was able to follow a direct route over Alexander Island.

MORE FOSSILS

On the way back from Carse Point, the Mt. Duemler party made an important discovery of fossils in a 150ft. exposure of argillites and shales just south of the point. These included ammonite casts, wood fragments, bivalves and belemnites. A layer of water-laid tuff over these beds was found to contain fragments of bivalves.

The fossils appear to be of Cretaceous age.

Glaciologists worked locally on movements of the ice shelf. In August an enormous iceberg caused a major disturbance of the sea-ice, and it was later found that 220 square miles of ice shelf had broken off east of the base.

In September, the main route inland across the heavily crevassed hinge zone was reconnoitred and found to be now completely impassable for vehicles. An alternative route was subsequently established.

At the beginning of October the new route was used by a party of four which managed to establish a field station at 78°20′ S., 17°30′ W., and make a complete week's whistler recordings. More than half of the recordings were synchronised with those at Halley Bay and Sanae Station. On several occasions whistlers were recorded simultaneously and should provide useful data, especially as the field recordings are free from base-generated interference.

SHIP MOVEMENTS

The R.R.S. Bransfield sailed from Southampton on October 8 and the R.R.S. John Biscoe on October 21. They carried 1000 tons of stores and 71 men for the bases; 60 of the men will winter there.

The Russian research ship Academic Knipovich visited South Georgia in August and September, and delivered mail, fresh fruit, and vegetables to the base at King Edward Point.

FOSSIL BLUFF MEN

Messrs Richard Walker and Roger O'Donovan, who were flown out from Fossil Bluff for urgent medical treatment (see "Antarctic" September, 1971, p. 93) are now back in England and well on the way to recovery.

The men were flown from the Bluff to Palmer Station by an Argentine Pilatus Porter aircraft in spite of bad weather, which forced them to make an intermediate stop at Adelaide Island. Then they were flown to the Argentine Comodoro Marambio Station on Seymour Island where they were joined by a sick man from Esperanza Station.

Bad weather prevented further flying for a week, but on September 29 an Argentine Hercules aircraft was able to pick the men up and take them to Buenos Aires, where they spent several weeks in hospital.

Ice thickness survey

Scientists from the Scott Polar Research Institute and the University of Ghent are conducting another airborne radio ice thickness survey in the Antarctic this summer. Using a United States Navy Hercules specially fitted with the radar equipment developed at the institute, the team, led by Dr S. Evans, will make a series of flights in Wilkes Land to support this summer's stages of the International Antarctic Glaciological Project.

The Hercules, which was used by the Technical University of Denmark in Greenland during the northern summer, is based at McMurdo Station. It will work primarily in East Antarctica, and occasional fuelling stops will be made at the South Pole and Vostock stations. About 300 flying hours will be devoted to the project.

This is the third time the Scott Polar Research Institute team has come south to measure the thickness of the Antarctic ice. In the last two seasons the team has spent 420 flying hours over the ice in areas covered to a thickness of up to 3000 metres. According to Dr Evans, sufficient flight lines have been traced to draw a map of rather less than half the continent. This season another quarter may be covered.

The other members of the team are Messrs G. K. A. Oswald, M. R. Gorman, C. H. Harrison and D. J. Drewry, of the Scott Polar Research Institute, and Dr H. Declair, of the University of Ghent.

Japanese Research Activities

Members of the winter team of the 12th Japanese Antarctic Research Expedition completed the series of rocket observations of the aurora at Syowa Station early this month. Since the return of spring several parties have travelled to Mizuho, the small inland station about 185 miles south-east of Syowa.

Two S210 sounding rockets were launched on September 14 and September 25. They reached heights of 70 and 85 miles respectively, carrying out observations of physical parameters in the aurora with success. The launching programme was for one S160 and six S210 rockets, and the launching date for the remaining S210 was December 1.

Spring journeys have been made to the exposed rock areas on the coast, and a supply team was sent to Mizuho. Late in September Mr T. Kimura led a party of five to the camp to make a deep drilling test and do related glaciological and meteorological work.

Professor Takasi Oguti, leader of JARE 12, and professor of atmosphere physics at the University of Tokyo, headed a party which left Syowa for Mizuho early in October. Four men now at Mizuho under the leadership of Mr Kimura will stay there until the middle of January next year.

JARE 13, led by Mr Zenbei Seino, left Tokyo for Syowa on November 25. Because of the sudden illness of the radio operator, Mr Y. Kimura, he was replaced by Mr Shigeru Oikawa two weeks before the Fuji departed.

The Japanese Government hopes to invite foreign observers to join the summer programme in 1972-73. The scheme is now being considered, and it is proposed that Argentina, New Zealand, Norway, and South Africa, should each be invited to send an observer.

Darts and dancing at the South Pole

A woman slept at the Amundsen-Scott South Pole Station on December 7 and became the first woman to spend a night at the bottom of the world. Miss Louise Hutchinson, Washington correspondent of the "Chicago Tribune," stayed overnight by accident—an aircraft which should have picked her up later in the day did not arrive.

Miss Hutchinson played darts, danced with some of the 57 men at the station, and attended a late night movie. Then she retired to the only bed in the sick bay.

An Antarctic veteran, Captain Finn Ronne, and his wife, became the first married couple to visit the Pole earlier in the day. Mrs Ronne is one of only two women who have wintered in the Antarctic. She was there with her husband's expedition in 1947-48.

R.N.Z.A.F. airlift

A Royal New Zealand Air Force Hercules will make five flights to the Antarctic this month in support of the New Zealand and United States research programmes. Since the R.N.Z.A.F. began its annual airlift in 1965 only three flights have been made each summer.

This season the supply operations will be recorded by a former war artist, Mr R. M. Conly, of Christchurch, who has also visited Fiji and South Vietnam. He will spend three weeks in the Antarctic, and will paint scenes at Scott Base, the historic huts, and other activities. His paintings will be used by the Antarctic Division, D.S.I.R., for overseas publicity to promote New Zealand's work in the Antarctic.

First stage of French traverse delayed

Bad weather, heavy going, and the stranding of a United States Navy Hercules after the completion of its supply mission, have slowed down the first stage of the French traverse across Wilkes Land towards the Soviet Vostok Station. This traverse, which began early last month, is the main scientific project in the French programme for 1971-72, and is part of the International Antarctic Glaciological Project planned by France, the United States, the Soviet Union, and Australia.

Last season the French established a small advance base, Carrefour, about 25 miles from Dumont d'Urville, at a height of nearly 3000ft. This was the starting point of the traverse. The French party, headed by Paul-Emile Victor, director of Expeditions Polaires Francaises, was delayed at McMurdo Station for ten days because of bad weather in the area of Carrefour.

A United States Navy Hercules flew 750 miles and landed the party and nearly three and a half tons of supplies in the field near the base on November 1. Some of the party went on to Dumont d'Urville, and later the traverse team of ten, led by Roger Gillard, began its 500-mile journey with five Castor caterpillar-tracked vehicles drawing eight cargo sledges and two sleeping caravans.

Last month the team was delayed by rough terrain and soft snow in the first two weeks, and some of the sledges were damaged. On November 30 the team reported that it was moving over a hard surface with small sastrugi at a height of about 8100ft. Temperatures of about minus 12.5 Celsius were being encountered.

When the team reached 68deg 20min S —137deg 20min E at a height of 7000ft a Hercules arrived on December 4 with fuel for the depots which are being installed along the route. The aircraft was making a jet assisted take-off when two jato bottles broke away from their fastenings, tearing off one propeller and damaging another.

The French team had to delay its journey until the arrival of a relief aircraft on December 7. It assisted the eight members of the damaged aircraft and the two passengers. They erected survival tents beneath the tail of the Hercules, and used installation, litters, other materials and snow blocks to fashion a windbreak.

When the Hercules crashed the French team was 125 miles from Carrefour. It expects to complete the first stage of the traverse by February next year. The second stage to Vostok will be completed during the summer of 1972-73.

ICE MEASUREMENTS

On the present traverse the scientific programme includes geodetic, glaciological and gravimetric investigations. To determine ice flows marker beacons will be set up along carefully controlled patterns, and their subsequent drift will be studied. At the same time, core drilling operations will be carried out to depths up to 165ft in order to take ice samples. These will be analysed to obtain data on glacial periods, atmospheric evolution, etc.

Towards the end of this month the relief ship Thala Dan will be at Dumont d'Urville. Supplies and equipment for the second stage of the I.A.G.P. will be unloaded with the aid of an Alouette helicopter, which will also be used during the summer.

Work planned at Dumont d'Urville this season includes the construction of a building and platform for the launching of weather sounding balloons. A

central radio communications building and a general store will be constructed and a 12,500-gallon fuel tank will be installed.

In the scientific programme an aerial survey of the Astrolabe Glacier will be made from the Alouette helicopter. The glaciological section includes experiments with a thermal drill for ice coring up to a depth of 1650ft. This will be done on the Polar Plateau about six miles from the coast.

Biologists will study the physiology of the Emperor penguins, and the programme of research on the structure and movement of the bird population in the archipelago of Pointe Geologie will be continued. A study will be made of the individual and social behaviour of penguins and petrels in the different age categories, and 5000 birds will be listed and tagged.

WEATHER STUDIES

Meteorological studies will include measurement of the temperature gradient in the low levels, and observation of polar meteorological phenomena. A panoramic camera will be used to photograph the aurora in the blue spectrum, and visual observations will be made of the night sky.

Ionosphere studies will include the reception of signals from the ionospheric satellites Alouette and Isis. Propagation of very low frequency signals in the atmosphere will also be studied.

Dr Gerard Martin, who will winter at Dumont d'Urville, will study the physical environment there and the microclimate. He will also conduct physiological and psychological research.

Thirty-one men will winter in Terre Adele ths season under the leadership of Robert Guillard. Three had not been selected when this report was received. The names of the others, their duties, and their scientific disciplines are:—

Medicine and the environment, Gerard Martin; animal biology, Yvon Le Maho, Philippe Delclitte; night sky, Bernard Collenot, Michel Dablemont; geomagnetism, Francois Robert, Claude Fouchet; ionosphere, Jean Luc Truche, Regis Boucajay, Francis Louis, Jean Presne; meteorology, Georges Pontier; radioactivity, Michel Lemonnier; cosmic rays, Alaine Chevalier; seismology, Philippe Lamy; electrical centre, Georges Noyau, Pierre Perdrix, Jean Pugibet; maintenance, Jean Marc Fouret, Pierre Fromentin, Michel Berthet, Michel Lamande; radio, Lucien Gongora, Jean Paul Leger, Andre Ory; cooking, Marcel Wuck, Philippe Kohler.

French flying postman

Mail for the main French Antarctic base, Dumont D'Urville, on the Adelie Coast, was carried all the way by air from France this season for the first time since the base was established in 1950. The flying postman was Mr Paul-Emile Victor, director of Expeditions Polaires Francaises.

When Mr Victor left Paris for Christchurch to join the French team which is taking part in the International Glaciological Project he carried 100 covers bearing French stamps. In Christchurch New Zealand Antarctic Treaty stamps were added to the covers, and Mr Victor took the mail to McMurdo Station when he flew south on October 22 in a United States Navy Hercules.

At McMurdo Station American stamps were placed on the covers and they were postmarked for the third time. Then after a delay of 10 days because of bad weather Mr Victor carried the mail to Carrefour, the small station on the icecap south-west of Dumont D'Urville, which was established by the French last season. There the French team of 16 men divided, one section beginning the first stage of the glaciological traverse to the Russian Vostok Station, and the other, including Mr Victor and the mail, proceeding to Dumont D'Urville.

Soviet traverse to Vostok

Geological and geophysical observations, and aerial photography, in the region of McMurdo Station are included in the scientific programme planned by the 17th Soviet Antarctic Expedition this summer. There will also be a scientific and transport journey from Mirny on the Knox Coast to the inland station, Vostok, near the South Geomagnetic Pole.

Between Mirny and Vostok, and on the return journey, Soviet scientists will make snow-measuring observations, and set up new automatic stations for the continuous recording of magnetic variations. Observations planned for a purely scientific traverse from Mirny to Vostok include geodesy, glaciology, seismic sounding, radio location, gravimetry, terrestrial magnetism, and meteorology.

This season the Ob and the Professor Vize will be used again for the transport of men, equipment, food, fuel, and building materials for the coastal stations—Mirny, Molodezhnaya, Novolazarevskaya, Bellingshausen, and Leningradaskaya.

Aerometeorological, hydrological, radiometric, hydrographic, and hydromagentic observations will be made along the ships' route to the Antarctic. The Ob and the Professor Vize will be used for marine studies, and oceanographic work (hydrology, hydrochemistry, marine geology, hydrography) will be carried out over the elevations along Longitude 20deg E. between Africa-Antarctica and New Zealand-Antarctica.

A reconnaissance will be made of the coast of the Amundsen Sea to select the site of the proposed seventh Soviet station. It is expected to be established at Cape Dart on the coast of Marie Byrd Land.

The Soviet expedition will continue investigations this season of the following ten problems: (1) Climate and atmosphere circulation of Antarctic; (2) physical and dynamic state of Southern Ocean waters; (3) morphology, dynamics, and the regime of the glacier cover; (4) ice cover of Antarctic seas; (5) geological structure and essential minerals; (6) ionosphere physics and radio-wave propagation; (7) morphology of geomagnetic field variations and their secular changes; (8) quick variations of the earth's electro-magnetic field as an indicator of processes in cosmic space; (9) geodetic control for mapping Antarctic; (10) adaptation of man to the conditions of Antarctica.

Observations will be continued at the six Soviet stations to obtain systematic data necessary for the hydro-meteorological and geophysical service of the U.S.S.R. A meteorological service will also be provided for the Ministry of Marine's fleet and Ministry of Fisheries ships cruising in the Southern Ocean.

Eight aircraft and two helicopters will be used for supplying Vostok, scientific investigations over the continent, ice reconnaissance, and transport flights. Twelve tractors will be used to draw sledges on the supply traverse from Mirny to Vostok.

CHRISTMAS CHEER

New Zealand field parties in the Antarctic will have home-made fruit cake and biscuits to eat on Christmas Day. The men at Scott Base will also have their share of more than 68 dozen packets of biscuits and three fruit cakes sent south this month by the Canterbury branch of the New Zealand Antarctic Society. This is the fifth season that wives of members and women members have provided Christmas cheer for New Zealanders in the Antarctic.

SOLAR FLARE EFFECTS STUDIED

Soviet research stations in the Arctic and Antarctic were linked recently in a scientific study of the effects of a solar flare. Rockets, weather balloons, and radar were used in the experiment, which lasted five days, and there were simultaneous launchings of rockets from Arctic and Antarctic stations, and research centres in the U.S.S.R.

The rockets were launched at pre-set intervals to obtain simultaneous data on the state of the earth's air envelope from near the ground to an altitude of 110 miles. The first series of launchings and parallel ground studies were conducted immediately the solar flare reports were received. When the flare disturbed the earth's magnetic field the second series of launchings was made. The third series was launched during the magnetic storm produced by the flare.

Simultaneous observations covered the ionosphere from 50 to 75 miles up, and weather balloons transmitted information from altitudes up to about 20 miles.

Atmospheric density and variations in pressure and wind conditions were also noted, and the scientists recorded data on the concentration of electrons and the ion composition of the atmosphere.

Director dies in Melbourne

Little more than a year after his appointment, Mr Bryan Rofe, director, Antarctic Division, Australian Department of Supply, died in Melbourne towards the end of August. He was 52, and before his appointment had achieved an international reputation for his work in upper-atmosphere research.

Mr Rofe was a science graduate from Adelaide University. He served in World War II as a meteorologist in the Royal Australian Air Force, and left the Bureau of Meteorology in 1948 to join the newly-formed Weapons Research Establishment in South Australia. In 1958 he was selected to carry out a programme of investigation of the upper atmosphere, using sounding rockets fired from Woomera and Carnarvon.

Mr Rofe was a member of the Australian National Committee for Space Research, and an Australian representative on the International Scientific Committee of the United Nations for Space Research.

Full details of Mr Rofe's career appeared in the September, 1970, issue of "Antarctic".

Antarctic Atlas completed

Soviet scientists have recently completed many years of work on a two-volume "Atlas of Antarctica," the first complete survey of the Antarctic Continent and the Southern Ocean. The atlas provides a thorough analysis of the results of exploration by the U.S.S.R. and other countries in the Antarctic.

More than 200 leading geographers and geophysicists from 18 Soviet research organisations took part in the preparation of the atlas. General guidance for the project was provided by the Arctic and Antarctic Institute of the Soviet Hydro-meteorological Service.

Volume I, which was completed two years ago, contains about 1000 maps, graphs, and diagrams. The first section deals with the Antarctic's geography, cartographic studies, and the history of exploration. The second section contains geographic maps of the continent and its various regions. There is a detailed geographic and geophysical picture of the continent and the islands and seas of the Southern Ocean.

Volume II contains a monograph detailing data given in the preceding maps. It also contains new information and theories which are the product of exploration conducted since the first volume was compiled.

CHILEAN NEWS

Expedition supported by Yelcho and Piloto Pardo

Since 1947 Chile has sent 25 expeditions to the Antarctic. Permanent meteorological stations were established then in the disputed area of the Antarctic Peninsula known to the Chileans as Tierra O'Higgins, and to other nations as Graham Land, Palmer Land, and Tierra San Martin.

But active Chilean interest in the Antarctic goes back to 1916 when the Chilean Government placed the tug Yelcho, commanded by Lieutenant A. Pardo, of the Chilean Navy, at Sir Ernest Shackleton's disposal for the rescue of the crew of the Endurance on Elephant Island. The names Yelcho and Pardo are still associated with the Antarctic because two ships of the Chilean Navy, the Piloto Pardo and the Yelcho, provide logistic support for the scientific activities sponsored by the Instituto Antartico Chileno.

The Instituto Antartico Chileno, which controls the planning and integration of scientific work, is an autonomous body attached to the Chilean Ministry of Foreign Affairs. Government departments and university institutions are also concerned with the planning and execution of the scientific programme.

Last season Captain C. B. Sanhueza, of the Chilean Navy, was commodore to the 25th Chilean Antarctic Expedition. A reserve officer, Captain H. V. Cuevas, head of the technical department of the institute, was in charge of the co-ordination of all scientific activities. The Piloto Pardo and the Yelcho provided the main logistic support.

Benthic communities were studied by Messrs I. Moyano, J. H. A. Yanez, L. Aburto and K. Reisse, of the Central Institute of Biology, University of Concepcion. They worked at Foster Bay, (Deception Island), Admiralty Bay (King George Island), and Chile Bay (Greenwich Island). Twenty-eight oceanographic, planktonic and benthic stations were established at Deception Island, 19 in Admiralty Bay, and 28 in Chile Bay and the English Channel.

Two scientists from the University of Chile, Valparaiso, Messrs C. Morano (biology) and P. F. Romo (oceanography) spent two months in Fildes Bay, King George Island, catching fish to study their stomach contents. They caught 312 specimens, using rods, nets, trawls and hand lines.

Soil biology and ornithology were the concern of Messrs C. Orrego (basic sciences) and G. Revuelta (natural sciences) from the University of Chile, and S. Varas (Chilean Navy). They took soil samples on Robert Island, and studied the nesting and breeding of birds, observing the temperature of eggs and chicks in the nests.

Working from Bernardo O'Higgins Station, Messrs G. Sanhuiza, Central Institute of Biology, University of Conception, and C. Vivar, National Museum of Natural History, carried out a taxidermy programme. They captured 58 birds and prepared the skins, and collected penguin eggs.

To complement the stratigraphic and palaeontological knowledge of the Jurassic and Cretaceous Periods in the South Shetland Islands, a geological party worked on Snow and Livingston Islands, and King George and Nelson Islands. Messrs V. Covacevich, of the geology department, University of Chile, P. Hernandez, of the National Museum of National History, and L. Fuentes, of the Chilean Navy, did

detailed sampling of fossiliferous strata, and preliminary mapping, and studied stratigraphic profiles.

A helicopter from the Piloto Pardo provided logistic support for a general survey of the west coast of the Antarctic Peninsula by Mr C. Maranguinic, of the geology department, University of Chile. The purpose was to define the most adequate area to start an intense glaciological programme in the Antarctic Peninsula.

The Yelcho provided logistic support for an oceanographic programme carried out by Messrs J. Munoz, J. Basten, R. Palmer and L. Miranda, of the Navy's Hydrographic Institute, and N. Silva, of the Catholic University of Valparaiso. They worked in Foster Bay (Deception Island), Chile Bay (Greenwich Island) and Admiralty Bay (King George Island). Following the benthic communities programme, work was carried on in 51 oceanographic stations with maximum depths of 493ft. Temperatures and water samples were taken at each station.

Mr J. Fuentes, department of geophysics and geodesy, University of Chile, worked between December, 1970, and February this year, on the general repair of the seisomological station at Bernardo O'Higgins Station. His work included the overhaul and calibration of seismographs, the quartz clock, and all auxiliary equipment.

Two geologists from the University of Chile, Messrs F. Munizaga and H. Moreno, worked at Deception Island in December, with the support of the Yelcho and the Piloto Pardo's helicopter. They made a geological survey of new craters associated with the eruptions in August last year, and studied the structural changes produced in the island by the eruptions. They also took samples of material ejected from the crater for chemical and petrographic analyses.

ICE CHOKES HUSKY PUP

A husky pup choked to death at Scott Base during the winter, not on seal meat but on a piece of ice. It was one of two pups kept from the first litter. Three pups were kept from the second litter.

Solo flight over South Pole

Without a flood of advance publicity an American airline pilot, Captain Elgin M. Long, made two notable Antarctic solo flights last month. In the course of a round-the-world flight Captain Long flew 3500 miles from Punta Arenas, Chile, over the South Pole to McMurdo Station, and then after a day's rest made a 14-hour flight direct to Sydney.

Captain Long, a 44-year-old pilot with the Flying Tiger Line, left San Francisco on November 5 and flew his twin-engined turbo-prop Piper Navaho over the North Pole to Stockholm. He then flew to London, and reached Punta Arenas on November 19 by way of West Africa and Brazil.

Because of a fault in a window heater Captain Long had to fly on instruments most of the way from Punta Arenas to McMurdo Station on November 22. He was over the South Pole at 2.59 p.m. but did not sight the Amundsen-Scott station. Just over four hours later he reach McMurdo Station. When he landed at Sydney in the late afternoon of November 24, having been assisted by tail winds, Captain Long became the first man to fly solo over the North and South Poles. He also made the first solo flights from Punta Arenas to McMurdo Station, and from the Antarctic to Australia.

Captain Long completed his round-the-world flight of 31,000 miles early this month when he returned to San Francisco. From Sydney he flew to Fiji, Wake Island, Tokyo and Honolulu.

SOUTH ON THE WINGS OF THE MORNING

By GERALD S. DOORLY

In the second part of his reminiscences (see "Antarctic", Vol. 6, No. 3, 1971) Gerald Doorly told of sailing south to McMurdo Sound in the relief ship Morning and there finding Captain Scott and his party all well but with his vessel Discovery firmly frozen in the ice.

In this third and concluding article the author relates how the Discovery was freed.

* * *

There was little hope that the ice would break out that season, and the Discovery was faced with the prospect of imprisonment for a second winter in the Antarctic. It was imperative for the Morning to get away north—the Sound was already showing signs of freezing over at night.

Shackleton was not considered well enough to remain for another winter, and much to his disappointment he had to return with us to New Zealand. (His place was taken by Lieut. G. F. A. Mulock, R.N., of the Morning.)

Shackleton was a bright, breezy, versatile soul; poetry was a joy to him, and he could quote pages from the Bible, Shakespeare, and indeed from most of the poets, Browning being his favourite.

He had a flair for sleight-of-hand feats which kept us guessing with his slick tricks; however, he hated fooling us, and invariably gave the show away. His box of tricks remained a standing joke.

Sailing day (March 2, 1903) was viciously cold with driving snow. It was hard saying goodbye. We asked some of our chums what they would like brought back from civilisation. Big hefty Armitage fancied a box of crystallised fruit; Michael Barne suggested a "cadge" pipe—"a large one to use only when visiting a neighbouring cabin-mate!"

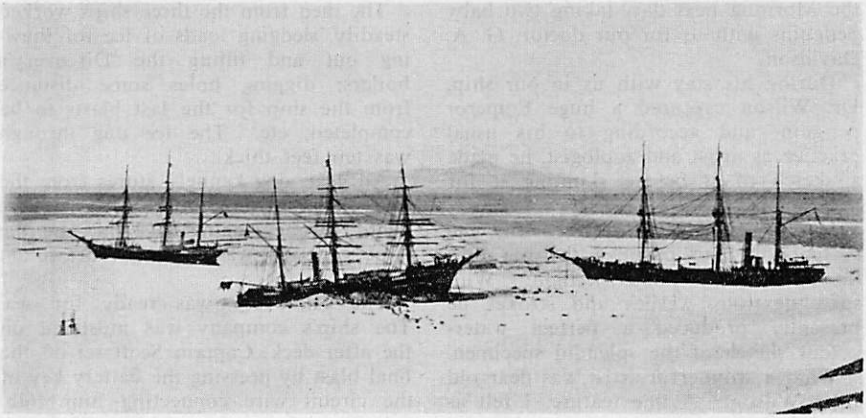
After lunch all hands got over on to the ice with their sledges, and rousing cheers were exchanged, the ensign dipped and the Morning, blowing her whistle, backed away and steamed north. The little group left behind waved and cheered until the snowdrift blotted them out from sight.

In three weeks' time we were back in New Zealand. A large New Zealand Shipping Company passenger steamer was in company with us up Lyttelton Harbour, and edging closely, a voice hailed us from the bridge: "Mrs Wilson is on board. Please hold mail for her." Mrs Wilson had voyaged out from England to meet her husband, and it was significant that her arrival should coincide with ours. Dr. Wilson was detained in the Discovery, but Shackleton was there to give Mrs Wilson first-hand information, at all events.

SOUTH AGAIN

In the spring the Admiralty, which had taken us over, arranged for the Morning to proceed from Lyttelton to Hobart and join up with the Terra Nova as an extra relief ship.

We all felt mighty mouldy at leaving New Zealand after our happy and interesting winter months there. As soon as we rounded Banks Peninsula, the weather grew mouldy too, being dull and misty for the most part as we steered to the south-westward well off the coast. Once past Stewart Island we stood away to the westward and after a fast passage across the Tasman Sea reached Hobart in good time.



The relief ships, Morning and Terra Nova, approaching the Discovery.

The Terra Nova had arrived there the day before. In command of Captain Harry McKay, a veteran whaler of northern seas, she was manned by three officers, Jackson, Elms and Day, and a crew of hardy men from Dundee.

We spent a busy month sorting out and transhipping stores for both Discovery and Morning.

Partly laden with 16lb. cylinders of gun cotton supplied by H.M.S. Royal Arthur, then flagship on the Australia Station, the relief ships sailed early in December, 1903, for the south, in high hopes that we would be able to blast the Discovery from her icy prison.

Arriving in McMurdo Sound a month later, we found a solid sheet of ice extending for 18 miles to Hut Point. However, we were earlier in the season, and much less pack had been met than we encountered the year before.

Our first visitors were Captain Scott and Dr. Wilson, who were camping at Cape Royds, only a few miles away. They were astonished to find a second ship. And why? The despatches from the Admiralty told the tale, and Captain Scott was much perturbed. If the Discovery could not be freed, she must be abandoned and her people and valuables returned by the relief ships.

Scott and Wilson spent the night in the Morning, and Evans and I spent it in their little green tent on Cape Royds. We enjoyed the change, though the sleeping-bags, after two sledging seasons, were hardly beds of roses, and the incessant cawing of penguins surrounding the tent was disconcerting.

During the forenoon, while we were still in our bags, men's voices could be heard above the squawking of the penguins. Crunch, crunch, came the steady march up the icy slope. Then there was a cooee-ing hail.

Like Brer Rabbit, we lay low until presently the flap of the tent was thrust open and the sledgers were indeed amazed to see the two new occupants.

Petty Officer Edgar Evans (who died with Scott eight years later), and Stoker Lashly, were two of the party of four who had sledged the load of stores from Discovery for Scott Camp.

Lashly soon had the primus under way, and produced a wonderful hash of strips of bacon mixed with stale oatmeal and seasoned with a generous helping of onion powder. The aroma was particularly delightful. The snow in the outer cooker soon thawed and boiled, and we swilled down pannikins of hot tea.

After clearing up the "wreck", the party left for the relief ships to sledge the heavy packages of mail to the Discovery.

The "Evanly Twins", as a wag in Christchurch christened us, returned to

the Morning next day, taking two baby penguins with us for our doctor, G. A. Davidson.

During his stay with us in our ship, Dr. Wilson captured a huge Emperor penguin, and according to his usual practice as artist and zoologist, he made a sketch of it before skinning it for museum purposes.

He borrowed my box of paints and sketchbook, and propped the big bird up against the poop skylight. With sure, dextrous washes and strokes he presently produced a perfect water-colour sketch of the splendid specimen.

What a wonderful artist was dear old Billy Wilson! A fine feature, I felt as I watched him at work, was that in spite of his using my paints and my brushes as a medium, he "saw" the result through his own beautiful mind.

Casually turning over a page of the sketchbook he seemed intrigued with a skeleton outline I had drawn of the land from Mount Erebus to Hut Point. I hoped to complete this as a coloured panoramic picture.

"What's this?" he asked. "A seal?"

THE DISCOVERY FREE

Freeing the Discovery was a formidable task, but after much blasting, aided in no small measure by heavy swells rolling into the Sound, the seemingly hopeless job was ultimately accomplished.

When all the men from the three ships had toiled for six weeks, the ice-field suddenly split into thousands of blocks, through which the relief ships crashed amidst shattering shocks, terrific tension and continuous cheering.

It was a dramatic experience, that race to the Discovery. It was midnight, with the sun skimming the southern horizon over the Barrier. The ships forced the final floes, and rounded Hut Point with rousing cheers from the Discovery's men who had assembled there, cheering and cheering again as they watched the ships steam triumphantly into the winter harbour. Everyone shook everyone by the hand. The Discovery was mobbed, and much excitement and merriment prevailed.

The men from the three ships worked steadily, sledging loads of ice for thawing out and filling the Discovery's boilers; digging holes some distance from the ship for the last blasts to be completed, etc. The ice dug through was ten feet thick.

All gear, dog kennels, stores from the hut, sledges, were shipped, sails were bent, running rigging rove off, and the large gangway was at length drawn on board.

The Discovery was ready for sea. The ship's company was mustered on the after deck, Captain Scott set off the final blast by pressing the battery key of the circuit wire connecting four 16lb. cylinders of gun-cotton in a tide crack on Discovery's port quarter.

The concussion was severe. The bay ice cracked in all directions, like streaks of forked lightning, and the ship's stern rose from being weighed down by ice surrounding the propeller, to an even keel. The heavy floes drifted away and, freed from all ice, we witnessed the release of the good ship Discovery riding to her anchors.

Cheers rang out, of course, from her consorts, ensigns were dipped and steam-whistles tooted.

NORTH ONCE MORE

The time was noon, and the weather perfect. At 6 p.m. thick snow was falling. At 10 p.m. we were bucking into a westerly gale—a most unusual quarter. And by midnight we became embroiled in a furious blizzard from the south.

We in the Morning were nearly wrecked on the lee shore of Cape Armitage. Captain Colbeck was stranded with Captain Scott in the Discovery. And the Terra Nova, with Captain McKay, was lost in the misty south.

Early next morning the gale abated and we sorted ourselves and our ships out. Captain Scott decided that the three ships should proceed to a glacier snout ten miles north, on the slope of Erebus, for transferring coal and odd stores.

The Discovery hove up her anchors. As she put her nose out of the harbour a violent squall broke from the

south which drove the ship bodily to leeward on to the two fathoms shoal off Hut Point.*

We witnessed the mishap with dismay. She heeled over, and was quickly blotted out by dense snowdrift.

The blizzard increased. We had not seen the Terra Nova, and the situation was nightmarish. All night the gale raged, decreasing suddenly in the morning, as so often happens in these regions.

We were abreast of Beaufort Island, and had been blown 40 miles up the Sound.

We plugged back towards Erebus, and in the evening we were thrilled to meet two ships alongside the glacier snout.

The Discovery, we learned, had had a gruelling experience, bumping on the rocks for nine hours. There was a good deal of damage to the ship, and it was fortunate she did not leave her bones in the Antarctic.

By next afternoon all work was completed, and we backed away from our ice-wharf and turned north.

With an escort on either side, the Discovery got under way and hoisted the signal "Follow Me". With squared yards and bellying sails, the ships ran before a spanking southerly. Repeatedly we looked back at the grim landmarks, now viewed, for all we knew, for the last time.

JOURNEY HOME

The ships proceeded in company for over 200 miles, following the ice-clad mountainous coastline. It was necessary to steer out to the eastward to avoid occasional tabular-shaped glacier ends which jutted well out to sea.

When abreast of Mount Melbourne, that fine symmetrical cone closely resembling New Zealand's Mount Egmont, the Discovery signalled us, "Proceed on your voyage—the pre-arranged rendezvous, Port Ross, Auckland Islands."

The Terra Nova remained as escort for Discovery to complete her magnetic survey work in Wood Bay.

Through stormy seas we struggled. The Southern Ocean was particularly boisterous, and our experience of gales from north-west to west for 24 days on end during that March, 1904, about constitutes a record. The boiler tubes had given out, and Morrison strove doggedly to patch them.

We made much leeway, for the ship was very light. It was a hard month, with frequent trips aloft to furl or close-reef sail.

For three days we were baffled off the Auckland Islands, but at long last the gales abated and blue sky greeted us for the first time since we left the Antarctic. Morrison got his engine going and we clewed up all sails and steamed for the islands at the depressing rate of one knot.

However, a "set" of some sort helped us along, and at two knots we approached the islands just before dusk on March 20.

What a joy it was to find our little ship steaming between Enderby and Ewing Islands, and into a haven of rest, aptly named Sarah's Bosom.

Rounding into the harbour, the masts of two vessels were seen over a point in the upper reach, so we anchored in Erebus Cove, five miles in from the entrance.

Lowering a boat, a party pulled round to the inner harbour, and we were delighted to find the Discovery and Terra Nova there. They had parted in a blizzard on the way to Cape Adare, and reached the Aucklands within a few days of one another.

Evans and I landed on Pig Point close by, and took a set of observations to verify our chronometer rates.

The hut was small. Stores and clothing were in one part, with a fireplace, and some rough bunks in another part. On the walls many names had been cut by men who were cast away there, and some memorials to crews who lost their lives, either from drowning or starvation. Near the hut was a little cemetery, with rough wooden crosses placed over the graves. Some were marked "Unknown", one, that of an infant aged five months. We added some stores and tobacco to the stock in the hut.

*This was the same shoal on which the Magga Dan carrying the Lindblad tour party ran aground on January 21, 1968.

Owing to our vessel's unballasted condition we took in 90 tons of large round stones from the foreshore. Work commenced at 6 a.m. each morning, and the first boat going in always disturbed a batch of sea lions which barked at us and waddled away into the scrub.

To commemorate our arrival from the south, we had a dinner composed of the products of the island. There were mussels, fricasseed cormorant, sea lion steak, and muttonbird.

After a brief spell of "spit and polish" to spruce up the ships for New Zealand, the Antarctic flotilla left Port Ross on the afternoon of Tuesday, March 29, 1904.

A strong south-west wind blew us along in fine style at eight to nine knots. Stewart Island was sighted next day, and at midnight the lights of Dunedin showed up.

With decreasing wind to a flat calm, we drew up to Banks Peninsula next evening, the little ships standing out darkly on a silvery, moonlit sea.

At daybreak on Good Friday we entered Lyttelton Harbour. The date was April 1, 1904. Few people expected to see the Discovery again, and many regarded the first news of the arrival as an April Fool hoax.

The pilot's tug greeted us with ringing cheers, the ships passing through the Heads in file—Terra Nova, Discovery, Morning—and steamed slowly up harbour.

Lyttelton was gay with whistle-toots and excitement. Continuous cheering crowds followed the ships in to their respective berths. A band struck up "Home Sweet Home", a touching enough welcome for us. Thus the National Antarctic Expedition had returned.

WINDS UP TO 181 MILES AN HOUR

Winds of up to 181 miles an hour—the strongest ever recorded at an Australian Antarctic station — were measured by the meteorological team at Casey during a three-day blizzard in October. The officer-in-charge at Casey, Mr J. Walter, reported to the Antarctic Division, Department of Supply, that the winds did not damage the station or equipment, and the meteorological instruments functioned throughout the blizzard.

Books on ice sell well

Bookselling is a new—and profitable—business in the Antarctic. In the 12 months to October 12 the New Zealanders at Scott Base sold 3836 books, and contributed about $800 to their country's public accounts.

The Scott Base profit in 1969-70 was $1300. Now they have opposition from their American neighbours at McMurdo Station, and this season a New Zealander hopes to sell encyclopaedias to the Americans.

Antarctic book buyers are visitors to Scott Base in the summer, men of the United States Navy, and scientists and technicians working for the National Science Foundation. Sales are handled through the Antarctic division of the Department of Scientific and Industrial Research. The most popular books in the last year have been "South" by Graham Billing, with photographs by Guy Mannering, and "New Zealand in Colour".

This season Scott Base will offer to customers "New Zealand and the Antarctic", by L. B. Quartermain, and "Penguin Summer", by Mrs Pam Young.

Mr Quartermain is the New Zealand Antarctic historian. Mrs Young is the wife of Dr E. C. Young, a former leader of the University of Canterbury's Antarctic research unit. She spent ten weeks at Cape Bird in the 1969-70 season as a field assistant, and was the first New Zealand woman to visit the South Pole.

TREATY NATIONS EXHIBITION

An international exhibition, contributed to by the 12 Antarctic Treaty nations, is being planned by the Canterbury Museum Trust Board to mark the completion of the proposed Antarctic section in the new centennial wing. It is hoped that the Antarctic section of the museum will be ready in time for the opening of the 1974 Commonwealth Games in Christchurch, which will bring many overseas visitors to the city.

Many distinguished men associated with exploration in the Antarctic and other parts of the world have agreed to their names being included in a special brochure to commend the international importance of the museum's proposals to establish a national Antarctic centre. This brochure will be used to support approaches to the New Zealand Government and overseas foundations.

The British list includes Sir Vivian Fuchs, director of the British Antarctic Survey and leader of the 1956-58 Commonwealth Trans-Antarctic Expedition; Sir Miles Clifford, chairman of the British National Committee on Antarctic Research; Mr Basil Greenhill, director of the National Maritime Museum, Greenwich; Dr Gordon de Q. Robin, director of the Scott Polar Research Institute; Sir Charles Wright, one of the few survivors of Scott's last expedition; Sir Philip Brocklehurst, a veteran of Shackleton's 1908-09 expedition; Mr Peter Scott, the wild life authority and son of Captain Scott; and Bishop W. L. S. Fleming, a former director of the Scott Polar Research Institute and a member of John Rymill's expedition to British Graham Land in 1934-37.

United States sponsors include Rear-Admiral George J. Dufek, the first United States naval support force commander in the Antarctic, and director of the Mariners' Museum, Newport News; Mr Philip M. Smith, deputy director of polar programmes for the National Science Foundation; Rear-Admiral David F. Welch, support force commander 1969-71; and Dr Henry M. Dater, the chief historian for the Antarctic support force.

European sponsors include Paul-Emile Victor, the noted leader of French polar expeditions; Commander Jacques Cousteau, the famous underwater explorer; Thor Heyerdahl, leader of the Kon Tiki raft expedition in 1947; and Mr Bengt Danielsson, director of the National Museum of Ethnography, Sweden, and a member of Heyerdahl's raft crew.

New Zealand signatories include the Prime Minister (Sir Keith Holyoake); the Leader of the Opposition (Mr N. E. Kirk); Sir Edmund Hillary, leader of the New Zealand section of the Commonwealth Trans-Antarctic Expedition; Dr R. A. Falla, chairman of the Nature Conservation Council, a member of Mawson's BANZARE expedition, and a former director of the Canterbury Museum; Mr R. B. Thomson, superintendent of the Antarctic Division, Department of Scientific and Industrial Research; Mr L. B. Quartermain, New Zealand's leading Antarctic historian; and Professor G. A. Knox, co-ordinator of the University of Canterbury's Antarctic unit.

SCHOONER CAPTAIN SCOTT

Captain Scott's name has been given to a 320-ton three-masted schooner in Scotland. The ship's figurehead is a life-size model of Scott.

The ship will be used by Scottish boys between the ages of 16 and 21. They will sail the schooner on month-long training cruises.

Fossil plants and animals

Fossil plants believed to be 200 million years old have been found in South Victoria Land by a Victoria University party led by Dr P. J. Barrett, of Wellington. Another university party led by Dr M. Laird, of Christchurch, has reported the discovery of the first animal fossils to be found in North Victoria Land.

The fossil plants were found at Shapeless Mountain, 100 miles west of Scott Base, on the edge of the Polar Plateau Geologists in the party say that they and the strata with them show clearly that this part of Antarctica once had a temperate climate similar to that of New Zealand today.

The plant beds in the area are from the younger part of the Beacon Sandstone, and have yielded the most varied collection of plants yet found in Antarctic beds of this age.

They are preserved as carbonised impressions in grey laminated siltstone, and include fern fronds 8in long, bamboo-like stems up to 4in across, grass-like leaves, small seeds, and a flower.

The geologists believe the plants were deposited in lakes on an alluvial plain at least 500 miles long. They have found that the beds above and below the fossils contain river sand with petrified logs, swamp-deposited silt with roots, old soil horizons, and coal beds.

Dr Laird's party, which was flown to the Evans Neve, 350 miles north of Ross Island, late last month, found several specimens of brachiopods (primitive shellfish) embedded in sandstone and limestone ridges leading onto the Mariner Glacier. Later, on other ridges, they found more brachiopods, and closely packed trilobiles, lice-like creatures extinct for hundreds of millions of years.

From the ages of the fossils, the party was able to date the Bowers group of rocks in which they were found to the early part of the Paleozoic age, 300 to 500 million years ago.

Fuchs reserved on Tourists

Sir Vivian Fuchs, director of the British Antarctic Survey, believes that tourists are acceptable in the Antarctic provided they do not go there too often and keep clear of parties engaged in scientific work. He told a staff correspondent of the New Zealand Press Association in London that he was against tourists calling in every week and interfering with studies which relied on conditions remaining as they were.

There is no harm in polar flights over the Antarctic, according to Sir Vivian Fuchs, provided the airlines do not want to set up navigation headquarters on the ground. "If this happened you'd get a different sort of person in the Antarctic —someone who was interested in serving 12 months, and then getting out," he said. "I'd be against that, because these technicians wouldn't be in the Antarctic tradition."

Sir Vivian Fuchs disagrees with people who say it is inevitable that the Antarctic will be over-run by civilisation like every other place in the world. "I don't believe this need be true," he said. "There are good reasons why the Antarctic should be left the way it is, and if someone wants to change it, they'll have to show me those reasons no longer hold good."

JAPANESE OPINION

Japanese scientists who have worked in the Antarctic realise that tourism will come to the continent eventually. But they would prefer to see tourists kept away and the Antarctic left untouched as far as possible until research work has been completed.

A marine biologist, Dr T. Hoshiai, who has spent a summer and two winters at Japan's Syowa Station, expressed Japanese scientific opinion in Christchurch this month. He was on his way to the Antarctic to assist in preliminary surveys for the Dry Valley drilling project which will start next season.

ROSS DEPENDENCY STAMP ISSUE

To mark the 60th anniversary of Scott's arrival at the South Pole a new set of definitive stamps for the Ross Dependency will be issued on January 18 next year. They will replace the present set which was first issued in 1957.

Shackleton's hut at Cape Royds appears on the 5 cent stamp, and Scott Base is shown on the 10 cent. There is a skua gull on the 3 cent stamp, and a Royal New Zealand Air Force Hercules on the 4 cent. H.M.N.Z.S. Endeavour is shown in McMurdo Sound on the 8 cent stamp, and the 18 cent shows a tabular ice floe.

The stamps were designed by Mark Cleverley, of Auckland, and printed in England. Mark Cleverley also designed the special cover to be used for the unaddressed first-day cover service. These covers will be date stamped at Scott Base.

As a special arrangement only full sets of these stamps will be available at all chief post offices and selected post offices until February 29 next year. The stamps will be available in any quantity from the Philatelic Bureau (mail orders), Private Bag, Wellington, the Philatelic Sales Sections, Auckland, Wellington, and Christchurch, and the Chief Post Offices, Wellington, and Dunedin.

FIRST AUTOMATIC OBSERVATORY

Australia's first automatic geophysical observatory in the Antarctic is still operating successfully after several months of winter temperatures down to 60deg. Centigrade below freezing and winds of up to 100 miles an hour. The observatory, which photographs the aurora and records ionospheric and geomagnetic phenomena for later analysis by physicists in Australia, was installed at an altitude of 4000ft on the Polar Plateau 50 miles inland from the station at Casey.

Engineers of the Antarctic Division, Department of Supply, designed and built the station to allow observations to be made in far inland regions where manned stations would be difficult to maintain. As far as is known it is the first unmanned station of its type to be installed in the Antarctic.

GEORGE DOVERS: VETERAN OF MAWSON EXPEDITION

One of Australia's first Antarctic explorers, George Harris Sarjeant Dovers, died in Sydney early in July, aged 84. He was one of the six survivors of Sir Douglas Mawson's 1911-14 expedition to Adelie Land, which discovered King George V Land and Queen Mary Land, and a member of the western party led by Frank Wild which spent a year on the Shackleton Ice Shelf—the first Antarctic camp to be established on floating barrier ice.

George Dovers was a 21-year-old Australian Government surveyor when he went south in the Aurora with the first Australasian expedition to the Antarctic. With few exceptions Mawson's men were young graduates of Australian and New Zealand universities. One exception was Frank Wild, veteran of the Scott and Shackleton expeditions, who was chosen as leader and sledge-master of the Queen Mary Land station.

Mawson and 17 members of the expedition established the Adelie Land station at Cape Denison in Commonwealth Bay, the "home of the blizzard." The Aurora took Wild and his men 1500 miles further west, and on February 21, 1912, left them to establish their home on floating ice 17 miles from the land itself.

With the exception of C. T. Harrisson, the biologist, who was 43, and Wild, who was 38, all the western party were in their early twenties. They were Dovers (21), cartographer, A. D. Watson (24), geologist, S. E. Jones (24), medical officer, M. H. Moyes (25), meteorologist, A. L. Kennedy (22), magnetician, and C. A. Hoadley (24), geologist.

When they had completed the building of their hut, the party instituted a regular meteorological and magnetic programme, and started autumn sledging. Wild, Dovers, Harrisson, Hoadley, Jones and Moyes attempted a reconnaissance of the coast slopes of the mainland. They reached a point 2000ft above sea level and 35 miles from the hut, but were forced back to the hut because of protracted blizzards and an unusually heavy snowfall.

Frequent blizzards and heavy snowfall marked the winter, but towards the end of August Wild, Harrisson, Jones, Moyes, Dovers and Watson, assisted by the three remaining dogs, set out on a depot-laying journey to the east. Food was cached on the Shackleton Ice Shelf 84 miles out. Temperatures as low as minus 47deg Fahrenheit were experienced, and on the return journey the party ran the risk of avalanches breaking away from the edge of the mainland, terrific winds, and cold blizzards.

Three men, Jones, Hoadley and Dovers, made a notable western journey of 430 miles, not counting relays, in the old man-hauling tradition. They set out on November 7 but made slow progress because of dangerous crevasses, gales and snow storms. Their first discovery was Haswell Island, several miles off the coast, near the present Russian base, Mirny. There they located an immense Emperor penguin rookery, and were the first to discover the nesting place of the Antarctic petrel.

After a journey of 215 miles by track, not counting relays, Jones, Hoadley and Dovers reached Kaiser Wilhelm Land. Then they climbed to the summit of Gaussberg, the small extinct volcanic cone discovered in February, 1902, by the German expedition under Professor Erich von Drygalski, who named it after the expedition's ship.

The ascent of Gaussberg was made on December 25 after Christmas dinner. On Boxing Day the party started the return journey, having covered an

actual distance of 300 miles, and been away from the hut for seven weeks. They struck more bad weather but took a better route further inland. On January 21, 1913, they reached the hut, and just over a month later were picked up by the Aurora.

George Dovers did not go back to the Antarctic again; he continued his work as a surveyor until his retirement. But one son, Robert, ensured that the name of Dovers did not disappear from the story of Australian Antarctic exploration.

Bob Dovers was also a cartographer, and began his Antarctic career when he wintered at Heard Island in 1947-48. He spent four months at Macquarie Island in 1948-49, and in 1951-52 was the Australian observer with the French expedition to Adelie Land, acting as cartographer, navigator, and dog handler with six Frenchmen who wintered at Pointe Geologie. When the Australian base at Mawson was established he was the first leader.

The other son, William, is a rear-admiral in the Royal Australian Navy and a member of the Naval Board.

Captain M. H. Moyes, R.A.N. (retd) is now the only survivor of the seven men who lived with George Dovers on the Shackleton Ice Shelf. There are four other members of the Mawson expedition still living. They are E. N. Webb, the New Zealand chief magnetician, who now lives in London, H. D. Murphy, who was in charge of stores, P. E. Correll, the mechanic and assistant physicist, and C. A. Sandell, the English-born wireless operator on Macquarie Island.

George Dovers has not been forgotten by Antarctic cartographers. His name was given to a prominent cape south-south-west of Henderson Island on the coast of Queen Mary Land, part of which he mapped nearly 60 years ago.

COLD RESEARCH

A medical research centre has been opened at Molodezhnaya, on the coast of Enderby Land, which is now the main Soviet base in the Antarctic. This season the centre will collect data on human adaptation to extreme cold, and pay special attention to the best sort of housing, diet, and fitness activities.

Less breeding among seals

There has been less breeding among Weddell seals this year on the west coast of Ross Island. In his studies of the seal population Mr D. G. Greenwood, of the University of Canterbury research unit, has found that seal numbers are similar to those in other years, but there are fewer breeding adults between the Erebus Glacier tongue and Cape Royds.

The extra numbers are made up of seals in the one-to-three-year age group. Mr Greenwood says it is uncommon for young seals to mix with the older animals. Usually they are forced by social pressure to live on the fringe of colonies.

Nearly all the adult seals are in good condition this year. Because of the fewer numbers there is less need for them to fight for breeding territory or to protect their access holes in the ice.

Between the glacier tongue and the southern tip of Ross Island, a further ten miles, there are very few seals. The adult population in the area being surveyed is about 450. There appear to be only half as many seal pups as usual. All those found have been tagged so their movements can be traced.

Mr Greenwood is unable to say at this stage in the season what has caused the difference in population. Later in the summer he will visit Hallett Station in Northern Victoria Land, another Weddell seal breeding site, to see if similar trends are occurring there.

A seal census next year should give some indication if the present population trend is continuing or whether the former balance has been re-established.

ANTARCTIC BOOKSHELF

PENGUIN SUMMER

By Pamela Young

XI + 166 p.p. ill. and end-paper maps. A. H. and A. W. Reed, Wellington, 1971

A few years ago this book could not have been written. While Antarctica remained a male stronghold, one had, as the sole contribution from the distaff side, Jenny Darlington's account of her Antarctic winter with Edith Ronne, while they were members of Commander Finn Ronne's expedition of 1947-48. Incidentally they were the first two women to winter in Antarctica.

But now that the break-through has occurred and women tourists, and women scientists, are visiting the Southern Continent in increasing numbers, each seems imbued with a desire to write a book about her experiences, and this trend will no doubt continue until the novelty wears off.

Pam Young is the wife of a distinguished New Zealand ornithologist. Her husband had already spent four successive summers in the Antarctic observing the breeding habits of the Adelie penguin and its predator, the skua gull, while she remained home in Christchurch carrying out the mundane tasks of a housewife and looking after their two children.

But when Dr Young announced that he was going south again for a fifth season his wife stated her intention of going with him. And go she did

Dr Young's task was to observe the penguin rookery at Cape Bird on Ross Island, McMurdo Sound. His wife gloried in the title of "field assistant". This involved many hours of making counts of the penguins in the several blocks that had been marked out besides such other jobs as observing the incubation cycle from egg laying to hatching, and snaring skua gulls for leg-banding. Through three long months, during which the weather was sometimes good but was often atrociously bad, Pam Young stuck to her task, sustained by her sense of humour.

Through it all she remained essentially feminine. She regularly washed and shampooed her hair and when they were finally flown back to base, she worried over what was the best of her Antarctic clothing she should wear. She was not above letting male members of the party carry her jacket and jersey in their packs when the weather was warm.

As the author says: "There wasn't much to do at Cape Bird except work" but even work can pall. Later she goes on: "I found the endless counting and checking of the penguin colonies as repetitive and boring as housework". And further on: "My vague dislike of penguins which had been growing gradually since the beginning of the season had now hardened into active repugnance. Their general yahoo behaviour, the pecking and treading of the chicks, the stupid aggression towards all and sundry reminded me of a pack of street-corner delinquents. I could hardly bear the sight of the pea brained little monsters".

With the work finished the Youngs were flown back to Scott Base to await transport to Christchurch and here Mrs Young has this to say. "Rubbish disposal is one of the biggest problems in the Antarctic and one which has received too little attention. The bases are surrounded by vast middens more reminiscent of the Middle Ages than the twentieth century". Of one of these rubbish dumps she says: "To a biologist or a conservationist it is one of the biggest blots on the continent, a place of pollution and infection. It particularly affects skuas which flock to it from all over McMurdo Sound and stay there gorging on its easy pickings when they should be on their breeding territories. They pick up new parasites and diseases from the food scraps they scavenge and often meet early and horrible deaths

from their innocence of fire and unknown substances."

This is a book to be enjoyed by all who are interested in wild life and are concerned about its conservation. It is well produced and there are some excellent illustrations of penguins and skuas.

One criticism applies to its title. Neither Pam Young nor her publishers seem to be aware that the wife of an American ornithologist, Eleanor Rice Pettingill, who accompanied her husband in 1953 to carry out studies of bird life in the Falkland Islands, also called her book "Penguin Summer". (See also Antarctic Vol. 5, No. 11, December 1970—p.p. 456-458).

—H.F.G.

RESEARCH IN THE ANTARCTIC

by Louis O. Quam

National Science Foundation, Washington, D.C.
Published by the American Association for the Advancement of Science, Washington, 1971.

Dr. Quam is chief scientist for the Office of Polar Programmes of the National Science Foundation which has been responsible for almost all of the present day scientific advances made by the United States in Antarctica.

This book is in many ways the same type of compilation as the New Zealand Antarctic Society's "Antarctica" and in many ways supersedes it.

The book is divided into seven parts and editors who introduce each part are Government research administrators in their special fields. The contributors of the chapters are all respected scholars and researchers associated with the United States Antarctic Programme. The result is a compendium of scientific findings with 39 chapters by 46 contributors and comprising 768 pages.

The contents are:—

Part I.—Introduction to Research in the Antarctic: A review of Antarctic research programmes, the international agreements and arrangements which permitted the unusual co-operative efforts by many nations.

Part II.—Biology: Reports on recent biological findings including trophic relationships in the Southern Oceans, benthic ecology and research in soils, land plants, lichens, blood proteins, penguins, seals and biomedicine.

Part III.—Glaciology: Glaciology and the methods by which this research is conducted. Studies of ice thickness, isostatic adjustments, snow accumulation and deep drilling methods.

Part IV.—Cold Poles and Heat Balances: A series of studies of cold poles and heat balances, the climate of the interior, atmosphere, meteorology and the interaction between Antarctica and the middle latitudes.

Part V.—Conjugate Phenomena: Results in the field of conjugate phenomena and magnetospheric research, auroral studies, particle precipitation in the ionosphere, inter-hemispheric micropulsations and the intensity and effects of cosmic rays.

Part VI.—Ocean Dynamics: Ocean dynamics, including the influence of Antarctic waters on the world oceans, the formation of Antarctic bottom water and a description and analysis of the Antarctic Circumpolar Current.

Part VII.—Gondwanaland: Findings concerning the theory of continental drift. Substantial scientific support is added to the hypothesis that there once existed a super-continent, Gondwanaland, which consisted of what is now Antarctica and parts of India, South America, Africa, Australia, and many smaller land masses.

"Research in the Antarctic" is a valuable reference volume for the scientist who works on or is interested in the Antarctic Continent. It contains hundreds of illustrations and tables and a comprehensive index. Each volume is accompanied by a large wall map, in colour, of Antarctica.

—Len S. Donnelley.

"ANTARCTIC"

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

Subscription for non-members of the Antarctic Society, NZ$3. Overseas NZ$3.50, includes postage (air mail postage extra). Details of back issues available may be obtained from the Secretary, New Zealand Antarctic Society, P.O. Box 1223, Christchurch, New Zealand.

The New Zealand Antarctic Society

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 membership fee is NZ$2.00 (or equivalent local currency). Subscription to "Antarctic" is a further $2.50.

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