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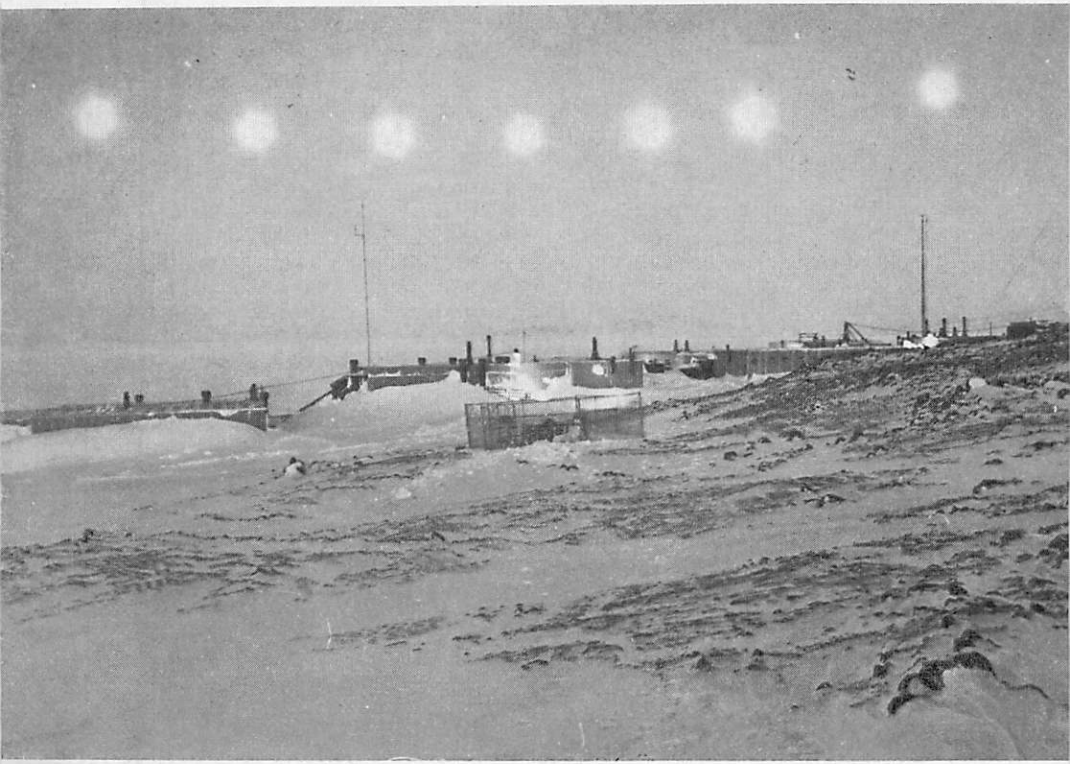

UNDER SEVEN MOONS: SCOTT BASE IN THE PALE GLOW OF THE ANTARCTIC WINTER MOON. THE MULTIPLE EXPOSURE BY R. K. McBRIDE, WHO WINTERED AT SCOTT BASE IN 1972, HAS CAUGHT THE MOON'S PASSAGE ACROSS THE SKY OVER McMURDO SOUND. SCOTT BASE, WHICH IS NEW ZEALAND'S PRINCIPAL ANTARCTIC STATION, WILL BE 20 YEARS OLD IN JANUARY NEXT YEAR.

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

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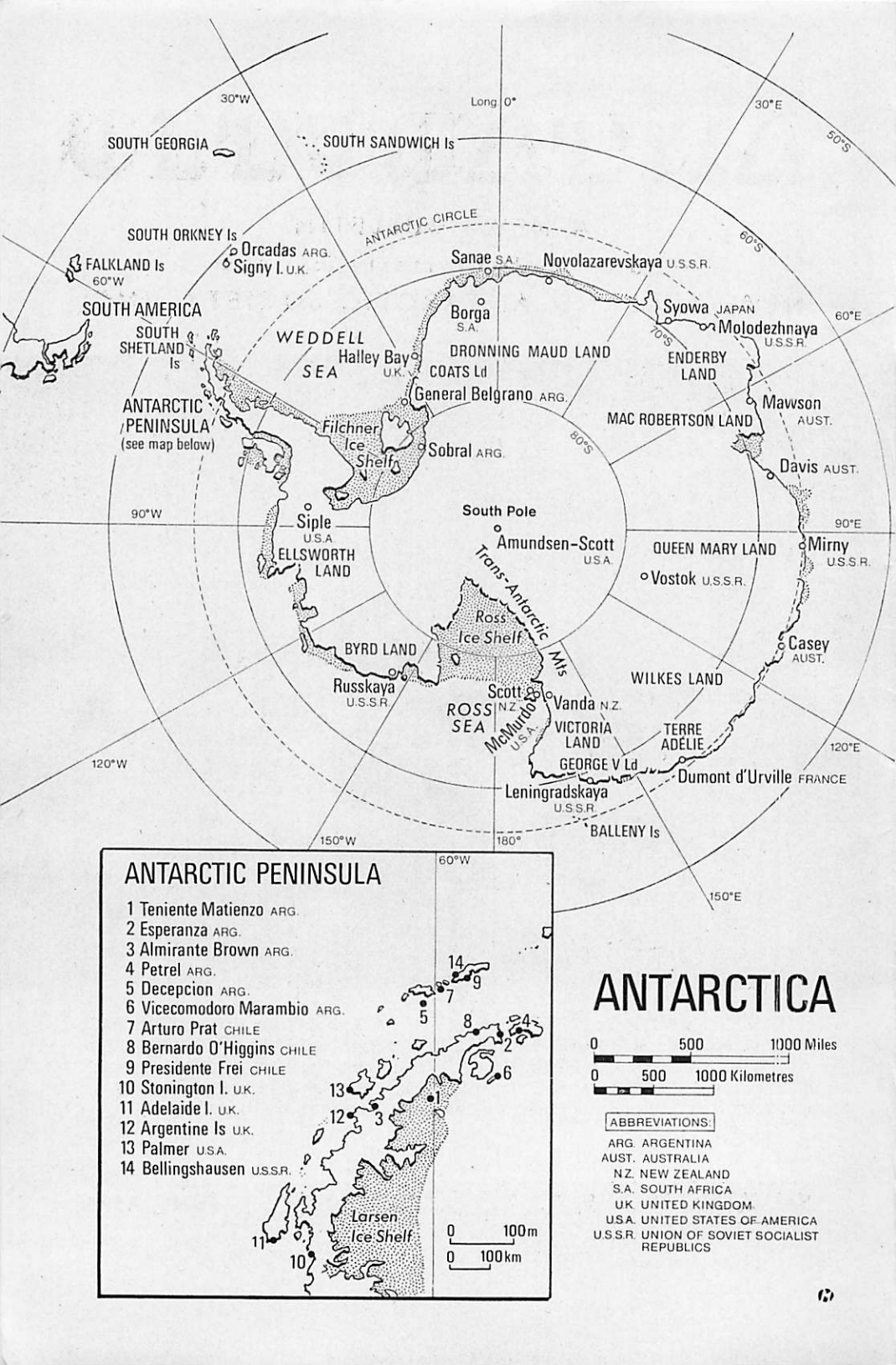

ANTARCTIC PENINSULA

1 Teniente Matienzo ARG.
2 Esperanza ARG.
3 Almirante Brown ARG.
4 Petrel ARG.
5 Decepcion ARG.
6 Vicecomodoro Marambio ARG.
7 Arturo Prat CHILE
8 Bernardo O'Higgins CHILE
9 Presidente Frei CHILE
10 Stonington I. U.K.
11 Adelaide I. U.K.
12 Argentine Is U.K.
13 Palmer U.S.A.
14 Bellingshausen U.S.S.R.

ANTARCTICA

0 500 1000 Miles
0 500 1000 Kilometres

ABBREVIATIONS:

ARG. ARGENTINA
AUST. AUSTRALIA
N.Z. NEW ZEALAND
S.A. SOUTH AFRICA
U.K. UNITED KINGDOM
U.S.A. UNITED STATES OF AMERICA
U.S.S.R. UNION OF SOVIET SOCIALIST REPUBLICS

"ANTARCTIC"

(Successor to "Antarctic News Bulletin")

Vol. 7, No. 10 **82nd ISSUE** **JUNE, 1976**

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CONTENTS

Millions of tons of krill in Antarctic waters represent the world's largest single remaining unexploited marine resource. Scientists, international organisations, and the Antarctic Treaty nations, have recognised that conservation, scientific study, and wise management are necessary if krill are not be go the way of the whale.

But resolutions have not stopped exploitation. The Soviet Union and Japan have been harvesting krill for some years. West Germany and Poland have entered the field, Norway is planning a krill expedition, and six other nations are interested.

Some of these countries have agreed with the recommendations of the Antarctic Treaty. But resolutions seem to be ineffctive when the stakes are high.

WINTER DIARY

Record low temperature at South Pole station

Winter arrived with a vengeance at the South Pole late last month. On May 28 a record low temperature of minus 102.4 degrees Fahrenheit was recorded at the Amundsen-Scott South Pole Station. This was a record low temperature for May, and broke the record of minus 102.1 degrees on May 18, 1957, when men first wintered at the Pole. Sixteen Americans and two New Zealanders settled in at the Pole Station on February 11 for a winter which, to date, has been the coldest at the South Pole since 1957.

On Ross Island 825 miles to the north 65 Americans, 11 New Zealanders, and one Russian exchange scientist had more sunshine than the winter team at the Pole—the sun set a month later. But McMurdo Station and Scott Base are not in the "Banana Belt" when winter comes. Darkness and low temperatures have been accompanied by snow and high winds.

Since the last flight to the Pole Station was made on February 11 meteorological records have been broken there every month. The lowest temperature for February was minus 56.7deg Celsius, recorded on February 29. Then temperatures began dropping steadily each week. The sun set on March 22, when the time-honoured holiday was observed, and minus 69.4 deg C was recorded in that week.

When the men at McMurdo Station and Scott Base saw the sun drop below the horizon for the last time on April 24 the temperature at the Pole was minus 72deg C, and the month ended with the thermometer at minus 69.4deg. Work on equipment outside the station stopped, and the 18 men prepared for the months of winter darkness.

RECORD LOW

Outside the geodesic dome which houses the station buildings temperatures continued to drop. A temperature of minus 69.1deg was recorded on May 21, and then on May 23 the recording was made on the Fahrenheit scale to mark the first minus 100 temperatures. May 23 was the day the temperature dropped to 100.4deg, and then on May 28 the 1957 record of 102.1deg was broken, the thermometer showing minus 102.4deg. Two Americans of the winter team joined this year's Club 300 at 11.30 p.m. on May 23, facing the temperature of minus 100.4deg after a sauna bath.

Nearly 20 years ago when the first Americans wintered at the Pole, the scientific leader, Dr Paul Siple, believed that the winter night temperatures in 1957 might reach minus 120deg F. He was proved wrong, but in May the men at the Pole Station endured 93 consecutive hours with temperatures at minus 90deg or colder, and at 3 a.m. on May 12 the coldest outdoor temperature (minus 100.4deg) was recorded. An unexpected cold snap in September began with a temperature of minus 99.7deg on September 11. Minus 100deg was recorded on September 18, and the thermometer finally showed the record of minus 102.1deg.

In 1957 there were no sauna baths or a Club 300 at the Pole Station, but two men put themselves to a cold endurance test on July 29 when the temperature was minus 98.8deg. They decided to go outdoors and determine how long they could endure without seeking shelter. One man wore 26lb of clothes, and the other 27lb. They gave up after three and four hours respectively in the darkness and cold.

When temperatures start to drop sharply at the South Pole, the men living there always face living problems. Heating, lighting, and plumbing, are their main concern, and this year's team have had to cope with frozen pipes, and equipment immobilised by the intense cold. And working in temperatures of minus 60 Celsius means frostbitten fingers and noses.

But living conditions are now more comfortable than those in the old station. There are facilities for recreation, and this winter the men have been weight lifting, playing pool and darts, and taking part in a cooking contest. Twilight will start to replace the winter darkness early in August, and the sun will return towards the end of September.

Winter at McMurdo Station has been marked by the same pattern of falling temperatures and living problems as the Pole Station. After the last aircraft departed on February 15, and the annual sea ice began to move out of McMurdo Sound, the weather was mild. Five inches of snow fell on February 22, and by the end of the month Winter Quarters Bay was ice-covered.

MORE SNOW

There was more snow in March, south-east winds bringing one inch on March 13, and another 2½ inches fell on March 20. The usual plumbing repairs began in April, and the sun set on April 24. In Winter Quarters Bay the ice was 35in thick. Temperatures began to drop each day.

By May 19 the winter ice had built up to a thickness of 42in. Two inches of snow fell during the month, and then the winter began to bite. Temperatures dropped to minus 34deg F on May 21, and to minus 36deg on May 23. The next day was a day of frozen drains and water pipes. May 27 was marked by strong easterly winds averaging 42 knots with one gust of 54 knots, and on May 28 the thermometer recorded minus 36deg F.

In spite of the cold and darkness the men at McMurdo Station continued their task of building a wider and larger ice wharf in Winter Quarters Bay. The old wharf, which had been in use for several seasons, was broken up and floated out to sea towards the end of last season. By the end of May the huge man-made ice cube had reached a thickness of nearly 5ft.

SCOTT BASE

Winter darkness and low temperatures are now the daily experience of the Americans' neighbours over the hill—11 New Zealanders at Scott Base. In his April newsletter the leader, Hamish Raynham, says that the average temperature for the month was minus 28.4 Celsius, one degree colder than the previous record of April, 1960.

Before the New Zealanders settled in for the winter—the last five of the summer support staff left on February 12—several New Zealanders made the last helicopter flight of the season to check the scientific hut at Cape Bird, and the historic huts at Cape Royds and Cape Evans.

February's weather was surprisingly good with infrequent snowfalls. By the middle of the month the temperatures began to drop fairly steadily. The average for the month was minus 25deg C. There was a cold snap at the beginning of March when the temperature dropped rapidly to minus 36deg. This period coincided with the dog sledge and motor tobaggan journey to Cape Crozier to erect the plaque to commemorate the winter journey of Wilson, Bowers, and Cherry-Garrard in 1911.

New Zealand's flag was lowered on the morning of April 25 after a short Anazc Day service conducted by Hamish Raynham. Clint Davis, a 22-year-old technician, who is the youngest member of the winter team, lowered the flag. After the sun departed the team began to adjust to the change from the continual daylight to complete darkness.

There were some magnetic storms in April, resulting in a few impressive auroras, although these contained little colour. The minimum temperature for the month was minus 41.4deg, and the maximum was minus 12.8deg. The strongest wind gust reached 48 knots.

First N.Z. Antarctic base 20 years old in January

New Zealand's first and principal station in Antarctica, Scott Base, will be 20 years old in January next year. Since 1957 its name has become synonymous with New Zealand exploration and research in the Antarctic.

When the base was established at Pram Point on Ross Island, it had a double role initially. It was a scientific station in support of New Zealand's contribution to the International Geophysical Year (1957-58), and a staging point for the New Zealand element of the Commonwealth Trans-Antarctic Expedition.

Scott Base was named in honour of Captain Scott who, 75 years ago, named Pram Point after the pram (Norwegian-type dinghy) used by members of his first expedition to cross a lane of open water which separated Ross Island at this spot from the ice shelf. Pram Point is a low rounded cape on the south-west side of Hut Point Peninsula, about 2½km north-west of Cape Armitage.

Pram Point was not the original choice of site for Scott Base. Butter Point, 65km west on the opposite side of McMurdo Sound, was the first choice. But this mainland site at the edge of a piedmont glacier, was found to have poor access by sea, and there was no satisfactory sledging route up the lower section of the Ferrar Glacier to the Polar Plateau. So the expedition leader, Sir Edmund Hillary, looked to Ross Island, where Scott and Shackleton had made their headquarters in the first decade of the century. Pram Point had the advantage of being close to McMurdo Station, and Winter Quarters Bay, where supply ships discharged their cargo.

When Scott Base was established it was praised by representatives of other nations as a model base for small Antarctic expeditions. A Ministry of Works architect, Mr W. F. Ponder, designed a base of six pre-fabricated main buildings. They were flat-roofed huts, connected by a covered way, and surrounded by auxiliary scientific huts.

New Zealanders — and Americans from nearby McMurdo Station — worked round the clock in the 24 hours of Antarctic summer daylight to erect the base huts. Eight men did the job—three Navy, three Army—and R. M. Heke, of the Ministry of Works, assisted by R. R. Mitchell, was in charge. But all the New Zealand expedition, and parties from H.M.N.Z.S. Endeavour, were involved in the work.

On January 11 the New Zealanders began the task of transporting stores, equipment, and building materials from the ships to the base. The site was levelled on January 10 by a United States bulldozer, the work being done by a team of Seabees, led by Lieutenant Richard Bowers, who had been in charge of construction of the Amundsen-Scott South Pole Station.

Construction of the base began on January 12, and the first New Zealanders to spend a night at Pram Point were J. H. Miller, deputy leader of the expedition, Heke, and J. Hoffman, a D.S.I.R. explosives expert. The first hut, known simply as "A", was ready by January 14, It had been designed as a mess-room, radio room and leader's office, but it was used as sleeping quarters for the building part. Others lived on the site in tents.

By January 20 Scott Base was established. A 20-year-old Maori from the Endeavour, Able Seamen Ramon Tito,

FIRST ARRIVALS—**Above: Scott Base under construction in January, 1957. At the right is a Ferguson tractor in its original state before modification for the Pole journey. Below: A Beaver aircraft of the Royal New Zealand Air Force Flight at the Skelton Glacier depot camp in the first year.**

raised the New Zealand flag on a flagstaff used by Scott at Hut Point in 1903, and Captain H. Ruegg, in his capacity as administrator of the Ross Dependency, declared the base established at a short ceremony.

MANY CHANGES

There have been many changes at Scott Base since the hectic days of January, 1957. As scientific programmes have expanded in line with improved air transport to and within Antarctica, the base has been modified and reshaped to accommodate larger scientific and support teams. The original buildings, designed for a life of three years, have been considerably modified down the years.

"A" hut was given over completely to mess and kitchen space, new huts have been built, and some of the originals have been resited or extended. A large packing case in which the Royal New Zealand Air Force's Beaver aircraft was brought south in the early years was even pressed into service, and converted into a ready-use store for kitchen supplies. There were big changes in the early 1960s. For example, a new garage was linked to the covered-way complex, the old one being converted for food storage.

New Zealand's first summer of science in Antarctica 20 years ago, was devoted to setting up continuous measuring and monitoring programmes in preparation for the I.G.Y. Five scientists, led by Dr Trevor Hatherton, moved into the newly-built base in January, 1957, and had their equipment in operation by March, two months ahead of schedule. The programmes covered ionospheric physics, seismology, geomagnetism, solar radiation, auroral activity, and tide and gravity measurements.

CAPE HALLETT

Early in 1957 New Zealand scientists also began work at Cape Hallett, 640km north of Scott Base. They were part of the winter team of 14 at the joint United States-New Zealand base. The three men had a massive task to sort out and instal their equipment. But in spite of many difficulties they were ready when the I.G.Y. programme began on July 1.

Scientists at Scott Base were largely confined to the laboratory by the nature of their work. But their first Antarctic summer did include some field work. During a reconnaissance of a possible route to the Polar Plateau for the Trans-Antarctic Expedition in the 1957-58 season, a party of three from Scott Base made the first geological survey of the Skelton Glacier area.

NEW METHODS

An Auster of the R.N.Z.A.F. Antarctic Flight flew the trio to the Skelton Depot, and in the next two weeks they manhauled sledges for almost 100km. Today modes of transport are distinctly different. Last season a New Zealand Geological Survey expedition spent two months and a half in the same area, and made the first New Zealand survey of the Skelton since 1957.

United States Navy Iroquois helicopters dropped the party of two geologists and two field assistants at a chosen base camp site, right among the rocks they planned to study. Two motor toboggans and two sledges were landed with them, the little tracked toboggans a substitute for manhauling. The men were only two or three days' sledging distance from Scott Base, but only an hour away by helicopter.

Until they were replaced almost entirely by motor toboggans, dogs were the basic transport for New Zealanders in the Antarctic from the time Scott Base was established. More than 60 huskies were taken south in the first year, 15 from the Auckland Zoo, 12 from Greenland, and 34 from the Australian base, Mawson. Today Scott Base maintains 23 dogs — enough for two teams. Most of them trace their descent from huskies of Greenland-Labrador cross presented to the Australians by the French Government. They were brought back to

Melbourne by the Commandant Charcot at the end of 1950 after the French had established their first Antarctic base in Adelie Land.

These dogs were kept first at the Melbourne Zoo. Then they were taken to Heard Island in 1951, and later to Mawson Station. Then in the 1955-56 season Mr Harry Ayres was sent to Mawson Station to bring back 30 dogs for the New Zealand party of the Commonwealth Trans-Antarctic Expedition.

Mr Ayres obtained 21 adult dogs and five pups at Mawson Station. Their ages ranged from three months to five years. They were brought to Melbourne in the Kista Dan by way of Heard Island, and Kerguelen Island, and then flown to Christchurch by way of Brisbane, Norfolk Island, and Auckland. Later they were taken south in H.M.N.Z.S. Endeavour with the 15 huskies bred at the Auckland Zoo and 12 bought from Greenland.

NEW STOCK

In the last 20 years new stock has been introduced to minimise the effects of inbreeding. Twelve dogs were brought from Greenland in the early 1960s, and in recent years stock has come from the British Antarctic Survey base on Adelaide Island, off the Antarctic Peninsula. Now the huskies live and die at Scott Base. Motor toboggans and air transport have replaced them except for short expeditions.

For the first winter Scott Base had a population of 23, including the five scientists and the men who formed the New Zealand element of the Trans-Antarctic Expedition. Now only 11 men winter at the base each season. Three technicians run the continuous scientific programme. The major studies of I.G.Y. are still run, and Scott Base is the southernmost station in a chain operated from the Pacific to Antarctica.

New Zealand's first residents in the Antarctic may have been tougher than their successors. The temperature inside the huts that first winter was set, by popular vote, at 52deg Fahrenheit (11.1deg Celsius). Today thermostats maintain a temperature of 60deg F (20deg C) inside the base.

FUTURE PLANS

New Zealand's Antarctic population changes every season, although some men have returned for a second or even a third winter. But in spite of its modifications, Scott Base remains a permanent, compact settlement, flanked on one side by a forest of radio masts, and on the other by spectacular pressure ridges forced up by the meeting of the waves of sea ice from McMurdo Sound with the flow of the Ross Ice Shelf.

When he designed the first Scott Base buildings Mr Pender prophesied that they should be in "first-class order in 100 years' time." But after 20 years changes have to be made. New Zealand has more than a foothold in Antarctica, and the needs of the many scientists who go south each season have outgrown the model base of 1957. There are plans to replace the original buildings with a larger, more modern complex of huts on an adjacent site — a continuously-manned station which will offer better facilities for the scientific research programmes.

SCOTT BASE CALLS CHEAPER

New Zealand's winter party at Scott Base this year faced the prospect of paying more to keep in touch with their families during their seven months' isolation when postal and telephone charges were increased in February. The cost for a call went up 375 per cent or 55 cents a minute—the highest increase of any.

But the Postmaster-General has now agreed that charges for winter calls will be halved. His decision followed representations by a Christchurch member of Parliament, Mr B. G. Barclay, who asked for a reduction because of the party's isolation, and the lack of winter mail.

New Siple Station to be built in two seasons

Preparations for the United States Antarctic research programme in the 1976-77 season include the design of a new station to replace the present Siple Station, 2250km from McMurdo Station, at the foot of the Sentinel Mountains in Ellsworth Land. Plans are also being made for the recovery of the last of the three Hercules aircraft damaged between January and November last year at Dome C, an ice dome in Wilkes Land 1150km from McMurdo Station.

Because of limited aircraft capability last season the United States scientific programme was reduced by about 35 per cent. In the coming season most of the projects which had to be cancelled, modified or curtailed will be resumed. These include the Ross Ice Shelf Project and the Ross Ice Shelf Geophysical and Glaciological Survey. There will be no Dry Valley Drilling Project drilling, but there will be numerous projects in the McMurdo Sound area on the sea ice or in the dry valleys.

Siple Station, which was built in 1970, is the most isolated United States station in Antarctica. It was occupied by four men all winter for the first time in 1973. Because of sickness among the summer team, and the limited availability of air transport, the station was closed for this winter.

Present plans are for the new station buildings and the metal arch under which they will be housed to be shipped to McMurdo Station in the coming season. Construction of the new station will be spread over the 1977-78 and 1978-79 seasons. The first winter team is expected to occupy the station in 1979. When the present station was built provision was made for a winter team of four or five. The new station will accommodate eight men for the winter.

PLANE SALVAGE

Recovery of the third Hercules No. 319) from Dome C will be a major task for the naval support force and VXE-6 Squadron in the coming season. No. 319 was more damaged than the other two aircraft, and needs a new mid-wing section which will be flown from McMurdo Station to Dome C. The recovery operation is expected to be less difficult this time because last season's team left a skiway and seven buildings on the ice-cap.

As a preliminary to its regular logistic support o fthe research programme, the United States Navy's VXE-6 Squadron will make the first flights of spring early in September to end the winter isolation of 65 Americans, 11 New Zealanders, and one Russian exchange scientist on Ross Island. Ski-equipped Hercules aircraft bringing mail, fresh fruit, and vegetables, will be the first the men have seen since February 15.

Winfly flights (the Navy's term for the spring flights (are expected to take about 140 passengers from New Zealand to McMurdo Station. Among them will be scientists who will make an early start on summer research projects, and technicians, meteorologists, equipment operators, mechanics, construction workers, and air traffic controllers. Some of these men will assist in the preparation of the Williams Field ice runway for the major airlift of summer support and scientific staff, which starts in October.

Air support for radar-echo sounding studies in East Antarctica and other areas will be provided by VXE-6 Squadron in the coming season. This will be the fifth season of the project, which has been conducted by the Scott

Polar Research Institute in collaboration with the United States Naional Science Foundation's Division of Polar Programmes, and in 1974-75, for the first time, with the Technical University of Denmark.

In the 1974-75 season a specially configured VXE-6 Squadron Hercules flew 50 missions for the project. New radar systems built by the Technical University of Denmark were operated alongside the system developed by the Scott Polar Research Institute. Fifty missions were flown by the Hercules over East and West Antarctica. The project was not continued in the 1975-76 season.

Since April this year the National Science Foundation's Office of Polar Programmes, which is responsible for the Antarctic research programme, has had a new title—Division of Polar Programmes—and Dr Robert H. Rutford is now division director. Other changes include the appointment of a new chief scientist, Dr Duwayne Anderson, formerly with the United States Army Cold Regions Research and Engineering Laboratories, and a new chief of the planning section, Mr Joseph Bennett, formerly with the Office of Naval Research.

South Polar Skua flies to Greenland

Skuas reached the South Pole long before man, and their presence far from the rim of Antarctica was reported when expeditions attempted to reach the Pole. Since the establishment of permanent scientific stations, more notice has been taken of the way in which the South Polar skua roams the continent.

South Polar skaus have been sighted from the South Pole Station, Byrd Station, and Vostok Station. Now one bird has flown out of the Antarctic into the Arctic. It was banded near Palmer Station, on Anvers Island, off the Antarctic Peninsula, in January last year, and was recovered in Greenland by an Eskimo on July 31.

Dr David P. Parmelee, professor of ecology and behavioural biology at the University of Minnesota, has described the bird's flight as remarkable, but not setting a record. The Arctic tern regularly makes flights from northernmost Canada down the west coast of Africa to the Antarctic. But the skua's flight was unusual because of the short time betwen banding and recovery. It provides the strongest evidence so far that South Polar skuas migrate into the Northern Hemisphere.

Dr Parmelee says there was evidence that the flight was not accidental. Also there is a strong possibility that the South Polar skua might be another bi-polar migrant.

The skua which flew to Greenland is believed to have left the Palmer Station area by the end of March. It was banded on a nesting ground on Shortcut Island, near Palmer Station, after hatching on January 20.

There are other instances of South Polar skuas having flown in the Northern Hemiphere, but no flights as far north as Greenland.

A live moth was discovered in a room at the Amundsen-Scott South Pole Station on March. It was housed in an appropriate container, and kept in the station library. Three house flies and a carpet beetle discovered at Palmer Station on Anvers Island, off the Antarctic Peninsula, were not so lucky. They were found to have breached a clause in the Antarctic Treaty, and were executed.

NO EXTENSION OF DRY VALLEY DRILLING PROJECT THIS YEAR

Pending a more complete understanding of the results of the Dry Valley Drilling Project (DVDP) results, which is likely to come out of a seminar to be held in Japan in 1978, the United States does not plan to support further extension of DVDP drilling activities. This was announced in Washington by Dr Robert H. Rutford, director, Division of Polar Programmes, National Science Foundation.

Scientific support for more drilling in Antarctica as a means of solving geological programmes, and another drilling programme in the 1976-77 season was expressed at the second DVDP seminar held in Wellington in January this year. New Zealand and Japan, the other two DVDP nations, were in favour of a drilling programme which would provide for the completion of the scientific objectives of DVDP by drilling another hole in the seabed sediments of McMurdo Sound. ("Antarctic," March, 1976, Page 277).

In his statement Dr Rutford said that participants in DVDP during 1976-77 were expected to concentrate on analysing present available core in an effort to resolve the project's original scientific goals (better understanding of the Cenozoic geological history of the McMurdo Sound area). Data from this phase of the project would contribute to formal presentations of results at a third and final DVDP seminar now scheduled to take place in Japan in mid-1978.

DVDP field activities this coming summer, said Dr Rutford, would be limited to downhole heat flow and seismic velocity studies at previous drill sites. There would be other specific investigations possibly involving participants from all three DVDP nations.

Winter visitor heard but not seen

Sixty-five Americans and one Russian wintering at McMurdo Station had their isolation broken by a visitor on May 18. The visitor—a United States Air Force Starlifter—was heard but not seen because it flew over the station at 41,000ft, and was not visible through the clouds and overcast.

To test its navigation equipment the Starlifter, which was on a flight round the world, flew from Christchurch to the Antarctic and back. Before the flight McMurdo Station provided a terminal weather forecast and kept in touch with the aircraft for most of the way south. The Starlifter left Christchurch at 6.39 a.m. and crossed the Antarctic Circle (60deg S) at 8.57 a.m. It arrived over McMurdo Station at 11.17 a.m.

During most of the flight the Starlifter reported north-west winds of 60 to 70 knots. It was unable to see McMurdo Station through the clouds, and could not provide information about ice and water conditions at the northern edge of the pack ice because of thickening clouds and overcast from about 130 miles north of the station.

On its flight round the world the Starlifter flew over the North Pole from Germany to Alaska. But it did not fly over the South Pole. It circled over McMurdo Station, flew some distance south, and then turned back for the flight back to Christchurch where it landed at 5 p.m.

In another three months the men at McMurdo Station will be able to see another aerial visitor and welcome its passengers and crew. The first of the pre-season Winfly flights will be made early in September.

ANARE'S FUTURE

Antarctic division's move to Hobart now definite

Although the Australian Government is still considering the country's future role in Antarctic research, and the administration of the scientific programme, it has reached a decision on the proposed transfer of the Antarctic Division of the Department of Science from Melbourne to Hobart. The Prime Minister (Mr Malcolm Fraser) told the House of Representatives last month there was no doubt that the transfer was going to take place.

Since the defeat of the Labour Government, which decided to transfer the Antarctic Division more than two years ago, there have been conflicting statements about the new Government's intentions. Early in February this year the Minister for Science (Senator Webster) indicated that the move, planned for 1978, would be delayed indefinitely.

Early last month Senator Webster announced during the conference of the Australian and New Zealand Association for the Advancement of Science that the proposed move would be the subject of a full-scale review, the main reason being the Government's cuts in public spending. He said the review would take into account the Antarctic Division's association with universities, problems of the proposed Hobart site, and prospects of servicing expeditions from the new headquarters.

Less than a week later, on the day the Government announced its new economic policies, the question was considered by the Cabinet. Mr Fraser announced the Cabinet's decision in the form of a reply to a question asked by Mr Michael Hodgman, the Liberal M.P. for Denison, the electorate in which the site of the proposed new headquarters is included.

DOUBT ON SITE

Mr Fraser said that the Antarctic Division would not necessarily be transferred to the site that had been chosen —he understood that there was some doubt about the wisdom of transferring it to that site—but it would be transferred to Hobart; there was no doubt about that. Because of financial stringencies the transfer would not be taking place forthwith or in the forthcoming financial year. But it was going to take place.

Original plans were for the construction of eight buildings on a six-hectare bush block owned by the Government at Kingston, about 20kms from Hobart. Seven of the buildings were for the Antarctic Division, and the eighth for

Support Force Command

Early this month Captain C. H. Nordhill assumed command of the United States Navy's Antarctic support force. He relieved Captain E. W. Van Reeth, who, after two years in the post, has been appointed defence attache at the United States Embassy in The Hague, Netherlands.

Captain Nordhill, who commanded the Navy's VXE-6 Squadron in 1971 and 1972, relieved Captain Van Reeth at a change of command ceremony which was held on June 4 at the Naval Construction Battalion Centre, Point Hueneme, California. He is the 10th naval officer to head the support force since 1955. Previously he was at the United States Naval War College.

the Hobart regional laboratory of the Australian Government Analytical Laboratories. The cost was put first at $7 million, and a later estimate was $8 million. Since then there have been suggestions that the move from Melbourne could cost twice that amount.

New there is likely to be more political argument about the proposed site. The proposal for the transfer to Hobart was made initially by the Labour M.P. for Denison. His successor, Mr Hodgman, has now suggested that a property on the Hobart waterfront would be ideal for the Antarctic Division.

H. Jones and Co. Pty. Ltd., which intends to transfer its operations from Hobart has placed its building on the market. The price suggested for the two-hectare property, which includes offices, storage space, and cool stores, is $2.5 million. The Tasmanian State Government is interested, and is investigating the feasibility of buying all or part of the property.

Mr Hodgman believes the site would be closer to other facilities than the proposed Kingston site. He says the refrigeration facilities would enable food to be stored for expeditions, and would help to acclimatise staff to the extreme cold of Antarctica!

Transfer of the Antarctic Division from Melbourne is not the only problem affecting the future of Australia's future interests in Antarctica. The science task force of the Royal Commission on Australian Government administration has recommended abolition of the Department of Science. It also suggests there should be no Minister specifically designated as Minister for Science.

References: Australian Federal Hansard, May 18, 1976; "The Age," Melbourne, the Melbourne "Sun," "Hobart Mercury," "Launceston Examiner," "Burnie Advocate."

"Antarctic" back issues and index

Subscribers to "Antarctic" who wish to complete their files can still obtain back issues of most volumes from the secretary of the New Zealand Antarctic Society, P.O. Box 1223, Christchurch. No back issues of Volume II are available, however, and there are gaps in other volumes.

Back issues cost $1 in New Zealand currency. Those more than five years old cost $1.50, and there is a discount of 10 per cent for 20 or more copies. Overseas subscribers should ensure that their remittances are converted into New Zealand currency.

Issues still available are:

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Volume V: Nos. 1 (12), 3 (24), 4 (24), 5 (30), 6 (48), 7 (50), 8 (75), 9 (50), 10 (24), 11 (100), 12 (24).

Volume VI: Nos. 1 (50), 3 (50), 4 (75), 6 (50), 7 (100), 8 (50), 9 (100), 10 (50), 11 (50), 12 (50).

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Copies of the index for all volumes except Volume III are still available. The price is $1 in New Zealand currency or the local equivalent. Numbers available are: Volume I (1956-58), 6; Volume II (1959-61), 12; Volume IV (1965-67), 70; Volume V (1968-70), 10; Volume VI (1971-73), 30.

Unwanted copies of "Antarctic" not listed here are needed by the New Zealand secretary. The society is endeavouring to assemble additional complete files of the bulletin. Unwanted copies of the index would also be appreciated.

B.A.S. NEWS

Winter routine for 80 men at permanent bases

Eighty men have now settled down to routine winter activities at the five permanent bases of the British Antarctic Survey. This year the winter teams include an advance party of four men at the new base at Rothera Point, which is 64km to the north-east of the present base on Adelaide Island. The Adelaide Island base will be transferred to Rothera Point in the coming season.

In March the Royal Research Ship John Biscoe revisited Signy Island and South Georgia, as scheduled. It picked up men and mail, and transported the B.B.C. television crew which spent three months filming in the Antarctic Peninsula area, and the northern islands. The John Biscoe then returned to the Falkland Islands and headed for home, arriving back at Southampton on April 20. Amongst its cargo were frozen biological specimens, and vehicles and other equipment for overhaul.

Meanwhile the R.R.S. Bransfield called at Adelaide Island, and the replacement station at Rothera Point in March. It landed supplies, including tractors, which had been transferred from Malley Bay. Earlier men from the Royal Navy's ice patrol ship, H.M.S. Endurance, assisted in the construction of an aircraft radio beacon and an anemometer tower at Rothera; the new air strip there was in use throughout last season. The Argentine icebreaker, General San Martin, and a Polish yacht, Gedania, also visited Adelaide Island in March.

FINAL VISITS

The Bransfield then turned north and paid final visits to the Argentine Islands and Signy Island before returning to South Georgia in mid-April to pick up parties which had been working in the field for five months. By then the weather had deteriorated, and there had been several bases.

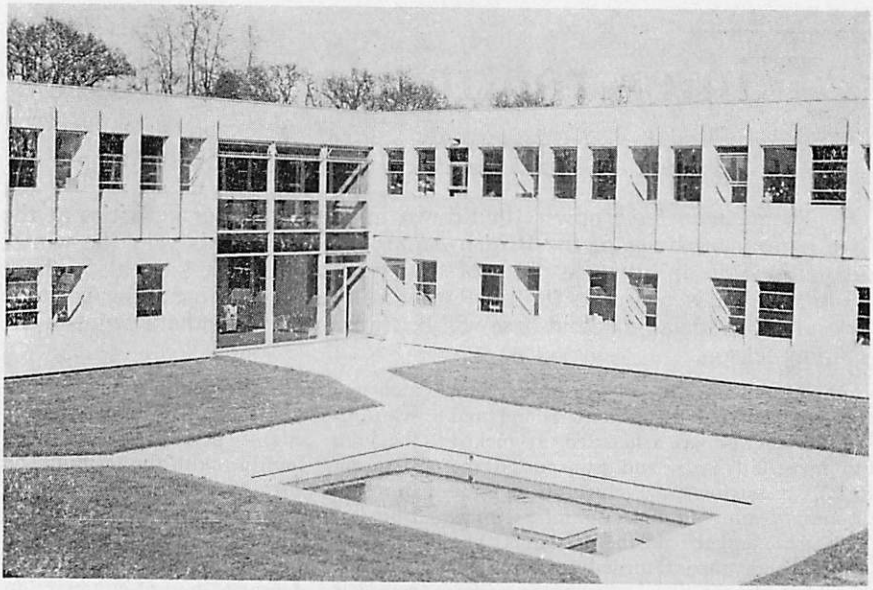
The traditional end-of-season football match between the Bransfield complement and base members was played in a semi-blizzard. It resulted in a win for the home side — perhaps because they were more familiar with the terrain. The Bransfield then left for the Falkland Islands and arrived at Southampton on May 19.

Both the B.A.S. Twin Otter aircraft completed their summer programmes in February, and were then flown north for their annual overhaul at de Havilland's, Toronto. One, with its pilot and engineer, is now on a three months' charter to Taylor-Woodrow for work in the Middle East. It is at present in Oman.

NEW COMPLEX

After 33 years the Survey now has a permanent headquarters building in Cambridge where all its scientific, administrative, and logistic activities are concentrated. The new complex of buildings, specially designed and built for the Survey, was officially opened on May 7 by the Duke of Edinburgh, who unveiled a commemorative stone of Antarctic granophyre. He was welcomed by Sir Peter Kent, chairman of the Natural Environment Council, of which the Survey has been a component body since 1967.

Prince Philip's interest in the Antarctic began during his 1956-57 world tour. After he opened the Olympic Games in Melbourne, and visited other places in Australia and New Zealand, he sailed for the Antarctic Peninsula in H.M.Y. Britannia. There he transferred to the R.R.S. John Biscoe and visited a num-



The central courtyard of the British Antarctic Survey's new headquarters at Cambridge, which was officially opened on May 7 by the Duke of Edinburgh.

ber of British I.G.Y. bases. One of his guests on board was the late Sir Rymond Priestley, then acting director of the Survey in the absence of Sir Vivian Fuchs.

B.A.S. REUNION

After the ceremony Prince Philip toured the building, looking at equipment and scientific exhibits. Later he was thanked by the director, Dr Richard Laws. Among the guests were representatives of the city and University of Cambridge, and of institutions with which the Survey has been closely associated over the years. Others present were members of the Survey's predecessors, the British Graham Land Expedition, 1934-37, and the Discovery Investigations.

A B.A.S. reunion was held on May 8. On May 22 there was a visit by the Friends of the Scott Polar Research Institute.

British scientific programmes in the Antarctic have been almost continuous since 1925, having been interrupted only for four years during the Second World War. For some years after Operation Tabarin high priority had to be given to geographical exploration and mapping. It was not until 1950 that a small office (the Falkland Islands Dependencies Scientific Bureau) was set up in London under the directorship of Sir Vivian Fuchs to organise exploration and mapping and publish the results.

RAPID EXPANSION

Programmes expanded rapidly in the next few years, largely as a result of the impetus given to Antarctic research by the International Geophysical Year, 1957-58. But by 1956 scientific administration had to be expanded because of the increasing volume and complexity of the scientific work. With limited funds this was achieved by setting up units in appropriate university departments and research institutes.

When Britain became a signatory to the Antarctic Treaty the Survey's future became assured. The Antarctic part of the Falklands Islands Dependencies was re-designated British Antarctic Territory in 1962, and the name of the Survey

Wartime links with the Royal Navy in Antarctic scientific research have been continued by the British Antarctic Survey. This B.A.S. photograph shows one of the helicopters from the ice patrol ship, H.M.S. Endurance, flying over the mountains of northern Marguerite Bay on the Antarctic Peninsula.

changed to British Antarctic Survey.

All the scientific sections flourished but their wide dispersal had its disadvantages. Continued development of the Survey's science needed simultaneous development of the headquarters' activities — staff selection and logistics, the maintenance of ships and aircraft, the co-ordination of field programmes, and the provision of central services.

To ensure maximum efficiency it was necessary to house all sections together in one place in permanent accommodation. The new complex constitutes the greatest landmark in the Survey's history to date. It provides a full range of laboratories, including a wet laboratory and a cold room, rock crushing and sectioning facilities, a garage-workshop and packing store, a conference room, and central services such as a computer, library, and photographic dark-room.

EARTH SCIENCES

On the ground floor there is provision for earth sciences, marine and freshwater biology, terrestrial biology, external scientific projects, and logistics. The upper level has more space for earth sciences, atmospheric physics, and administration. There is a permanent staff of about 70, but numbers will be doubled during the summer months by the influx of contract staff who will be trained before going south, and those who return to write up the results of their work.

Already the conference room has been put to good use. Last month there were meetings of the S.C.A.R. conservation committee, the bird biology sub-committee, and the biology working group. Some of their members also took part in a discussion meeting on scientific research in Antarctica. This was convened in London by the Royal Society, and organised by Sir Vivian Fuchs and Dr Richard Laws. The proceedings will be published in the Philosophical Transactions of the Royal Society. Most of the papers were presented by members of the B.A.S.

[Some of the material in this report has been summarised from a commemorative booklet produced by the British Antarctic Survey for the opening of its new headquarters building.]

SOVIET NEWS

Major traverse to Dome C and Dumont d'Urville

A major Soviet geomagnetic traverse in East Antarctica from Pionerskaya (60deg 50min S., 95deg 30min E) to Dome C (74deg 30min S., 125deg E) in Wilkes Land, 1150km from McMurdo Station, and on to the French base, Dumont d'Urville (66deg 40min S., 140deg 01min E) is planned for the International Magnetospheric Study (IMS), 1976-79. The traverse is linked with the International Antarctic Glaciological Project (IAGP) for the study of the East Antarctic ice sheet in which Australia, France, the Soviet Union, the United Kingdom, and the United States have worked together for several years.

Pionerskaya, which is about 400km from Mirny, is on the traverse route to Vostok. It was the first Soviet inland station, and was in use from May 27, 1956, to January 15, 1959. Since then it has been used by Soviet scientists each season during their glaciological studies. The proposed geomagnetic traverse, which is likely to be spread over several seasons, would cover more than 2300km.

Soviet scientific research was extended to the southern part of the Weddell Sea area in the 1975-76 season. The scientists worked from a new station, Druzhnaya (77deg 58min S., 39deg 18min W), established for summer work on the Filchner Ice Shelf. It was in use for two months, and the scientific team then returned to Leningrad aboard the research ship Kapitan Markov.

ANCIENT ROCKS

A preliminary reconnaissance was made for the long-range programme of exploration of the mountain systems which fringe the Weddell Sea. Geologists made helicopter flights to the Shackleton Range and the Pensacola Mountains, and collected rock and mineral samples for further study. They discovered rock at least 4000 million years old—some of the oldest on earth —and made the first ascent of the slopes of the Shackleton Range.

Other scientific work carried out at Druzhnaya included experimental parachute landings of instruments on the Filchner Ice Shelf for seismic, gravity, and magnetic measurements. Stations were selected for the establishment of a ground radio-geodetic system. This will enable aircraft positions to be coordinated, and the astronomical coordinates of stations to be determined.

Druzhnaya is similar to the Soviet base on the Amery Ice Shelf, and is expected to be in use until about 1980. It will serve as a base camp to support geological and geophysical surveys in the Shackleton Range, Theron Mountains, Pensacola Mountains, and mountains in the south-east of the Antarctic Peninsula.

ICE STUDIES

Glaciological investigations for the International Antarctic Glaciological Project were continued along the line from Mirny to Vostok. The distance between these stations is 1500km, and in past seasons the tractor sledge trains have covered only a fifth of the distance each year. Last season the distance was doubled, and a tractor sledge train covered about 600km and reached the area of the former Vostok I station, which was in use during the first five years of the Soviet traverse programme.

During the traverse from Mirny geo-

magnetic observations were made along the route. New automatic magnetic variation stations were installed, and existing ones were checked.

Aerial ice reconnaissance was conducted in the regions of four coastal stations, Molodezhnaya, Mirny, Leningradskaya, and Novolazarevskaya. Aerometeorological, hydrological, geophysical, radiometric, and glaciological observations were from the expedition's ships, Mikhail Somov and Professor Vize. Meteorological observations were made along the routes of three other ships of the Soviet Antarctic fleet, Kapitan Markov, Vasiliy Fedoseyev, and Mikhail Kalinin.

RADIO PROBES

New research last season included studies of the nature of blizzards and hurricanes, and additional radio probing of the near-surface layer of the atmosphere. Teams from the expedition continued and completed the drilling of a shelf glacier near Novolazarevskaya. In the 1974-75 season the scientists who began the drilling, using a thermodrill, struck a rock bed at the 374-metre level, and obtained an intact column of core.

Eleven scientists from East Germany took part in the work of last season's expedition. An American geophysicist worked at Vostok under the scientific exchange programme.

POLAR LIVING

Psychological studies of men working at Soviet stations have shown that they are the best model of a confined social community with stable relationships. Complete isolation, winter darkness, and freezing temperatures, have not created barriers between the men.

Examinations at Mirny showed a more stable situation there than at the smaller stations, and the psychologists suggested that the best size for a polar community is between 50 and 70, with a mixture of people with different professions and interests. Mirny provides an opportunity for the men who live there to have a balanced day of work and play with plenty of facilities for recreation.

FIRST STATION

Twenty years ago the Soviet Union established its first station in Antarctica. The hoisting of the flag at Mirny was commemorated in Leningrad earlier this year. Professor Alexei Treshnikov, director of the Arctic and Antarctic Research Institute, and the Soviet Union's most eminent polar scientist, used the occasion to emphasise that his country did not pursue any political or economic goal by its steadily mounting contribution to research in Antarctica.

Russkaya station not yet manned

A new Soviet coastal station, Russkaya, is named on the map of Antarctica which appears on the inside front cover of "Antarctic". But it still has to be established by a Soviet expedition.

In the 1972-73 season the opening of Russkaya at Cape Burks (74deg 42min S/131deg 51min W) on the Hobbs Coast of Marie Byrd Land, was delayed for a year. One of the main tasks of the 18th Soviet Antarctic Expedition was to establish the station, but bad weather prevented the supply and research ship Ob coming closer than 200 miles to the ice-bound shores of the Hobbs Coast.

Three temporary houses, food, and some equipment were flown to Cape Burks by helicopter, but work had to be discontinued because of icing of the Ob. The intention then was for a party to winter at Russkaya in the winter of 1974.

However, nothing was done in the 1973-74 and 1974-75 seasons, and there has been no indication in Soviet reports of when the station will be manned.

Call for review of Japan's research activities

Japan's future research activities in Antarctica should include basic studies of the development of the continent's natural resources, and the effect of such development on the environment. Large research projects of great scientific significance should be carried out on a priority basis over the next 10 years.

These recommendations are contained in a report to the headquarters for the promotion of Antarctic research of the Ministry of Education, Science, and Culture, which has supervised Japanese Antarctic activities since 1956. The report was made by the Council for the Study of Future Problems of Antarctica, and was approved by the headquarters at its general meeting in Tokyo in April.

In its call for a review of Japan's Antarctic research projects the council suggested that basic studies of the development of natural resources should include geological features, and international co-operation in such studies. If Japan developed natural resources in Antarctica, a separate government organisation should be created by the reorganisation or elimination of the Headquarters for Promotion of Antarctic Research.

The report also said that Syowa Station on East Ongul Island off Prince Harald Coast was an advantageous point for aurora observations, but it had disadvantages for geological and biological research. This was because transport of materials across the sea ice to East Ongul Island became difficult in summer.

Since Japan established Syowa Station in preparation for the International Geophysical Year (1957-58) there have been several changes in the administration of the nation's research programme. The Polar Research Section was established in the National Science Museum in Tokyo in 1962 under the jurisdiction of the Ministry of Education, Science, and Culture. This body has since been expanded, and in 1973 became independent as the National Institute of Polar Research, also under the Ministry's jurisdiction.

Research activities of the institute cover many scientific disciplines. Its major effort is directed to the Antarctic. It is responsible for carrying out the scientific and logistic programmes of the Japanese Antarctic Research Expedition (JARE). JARE is under the authority of JARE Headquarters, of which the Minister of Education, Science, and Culture, is chairman.

In future the British Antarctic Survey's two research ships will each have two masters. They will share the eight-month Antarctic voyage, and duties in the United Kingdom—supervising the annual refits, and taking part in planning the ships' programmes. In the past masters' duties have prevented them from taking their anual leave.

This new arrangement came into force when the Bransfield and the John Biscoe sailed south in October. Captain John Cole joined Captain Stuart Lawrence as master of the Bransfield. He joined the Survey in 1960, and served in the R.R.S. John Biscoe and Shackleton, becoming master of the former in 1969. He resigned in 1972 and joined the Scottish Marine Biological Association to be able to spend more time at home. Captain Chris Elliott (formerly chief officer) joined Captain Malcolm Phelps as master of the John Biscoe.

SUB-ANTARCTIC

Biological work on Marion and Prince Edward Islands

Since 1965 South Africa has supported several research programmes into the biology of its two sub-Antarctic islands, Marion and Prince Edward. The first scientific expedition in 1965-66 yielded much information on the geology, zoology and botany of the two islands. The original biological programme has since developed into three subordinate programmes, concentrated respectively on the mammalogical, ornithological and biogeochemical aspects of the islands' ecosystems.

The Mammal Research Institute of the University of Pretoria has, since July, 1973, had at least one mammalogist with an assistant on Marion. Mr P. R. Condy has been studying the ecology of the elephant seal and the Amsterdam fur seal. He also collected information on the seasonal appearance of the killer whale since July, 1973 until April, 1975. Mr R. van Aarde has been studying the ecology of the feral cat and house mouse populations.

The seal programme includes growth studies of young elephant seals, intra-seasonal and inter-seasonal movements of both species, seasonal abundance and haul-out patterns of both species, and aspects of the reproductive physiology and taxonomy of the fur seal. Some behavioural work has been done but the climatic conditions rather limit the scope.

The small mammal programme on the feral cats and mice includes population studies, breeding ecology, aspects of the cats predator-prey relationship, growth studies and reproductive physiology. Again climate and the secretive nature of the cats, limits the scope of behavioural studies.

Facilities on the island are ideal considering the logistic problems. There are two laboratories with all basic necessities. Recently a large freeze room has been constructed which is of great value to the mammal programme. There are no vehicles (apart from wheelbarrows) on the island, so all field work is done on foot. Six circular asbestos huts were constructed at various points round the island in November, 1974. These huts provide comfortable refuge and enable the biologists, in particular the mammalogists, to work at distant parts of the island.

On Marion Island the fur seals occupy the north and west coasts while the elephant seals occupy the south and east coasts. Since the main base lies on the east coast, some months have been spent camping on the west coast to study the fur seals.

For the next two to three years the specimens and data will be processed and analysed at the institute. Short visits to the island to complete the data are envisaged. The present five-year programme will provide a picture of the mammal ecology from a more general point of view. Thereafter, specific aspects will be studied on a more intensive basis.

The present ornithological programme is a five-year one which started in April, 1973 and is conducted by the Fitzpatrick Institute for Ornithological Studies of the University of Cape Town.

The aims of the programme that were formulated determined the scope of the project. They will be to determine the energy and mineral contributions of the birds to the Marion Island ecosystem, and to assess the ecological adaptations, the energy needs and strategies of the birds breeding in the maritime sub-Antarctic region.

The programme was initiated by a preparatory period in which all relevant material had to be collected. It entailed a literature search, purchasing of equipment and experimenting with methods and techniques on local seabirds.

Being adequately equipped for the task, two ornithologists, Messrs A. J. Williams and A. J. Burger embarked on the French vessel Marion Dufresne early in January, 1974. They were followed in October by Mr A. Berruti.

ISLAND BIRDS

The primary objective of the intial field period was to obtain data for the determination of total biomass and seasonal standing crops of 13 avian species readily accessible from the base. First, a census of the 13 key species was carried out over the whole of Marion Island from January to April, and in May on the eastern coastal area of Prince Edward Island. For seasonal assessment of populations, regular monthly censuses were made in areas near the base.

Ten species were thoroughly studied in respect of breeding biology, and a mass of information was gathered by making daily checks over a six-month period. Never before has such a detailed study involving so many species over a one-year period been attempted in the sub-Antarctic region.

Egg samples of all key species were obtained which were analysed in the laboratory to obtain the calorific values. Also incubation temperatures were measured by telemetry from eggs of the Gentoo and Rockhopper penguins, Southern Giant Petrel, sooty albatross and the kelp gull.

The young of 10 species were weighed as soon as they hatched, and thereafter for the next 40 consecutive days, and afterwards at regular intervals, to record their energy requirements and the energy cost to the parents. Young of the more prolific species were culled at different growth stages to determine body fat and protein composition. A number of petrels were culled to obtain carcase calorific value, as these form important elements in the diets of the skua and the feral cats.

Finally, the energy cost was assessed during moult of the Rockhopper and Macaroni penguins. The visiting of a couple of vagrant birds was also recorded, some of them for the first time, especially waders and passerines.

This initial field period is now being followed up by a laboratory phase where all the accumulated data and specimens are being processed. A second field period is to begin in April, 1976, during which certain aspects will be extended, gaps filled and a few more areas opened. The material collected will then be processed to complete the programme in April, 1978.

Apart fro mall the other publications, the Fitzpatrick Institute intends to compile a field guide to the birds on Marion Island for the use of future expeditions.

Cupboard was bare

Four New Zealanders and four Americans made a three-day sledging trip from Scott Base last month to visit an isolated Weddell seal colony, but when they got there the cupboard was bare. The seals apparently had travelled further north for the winter.

The colony, at White Island, 25km south of Scott Base, has been studied during past summers, but it is rarely visited in winter. The sledging party was led by the dog handler, Mike Wing, of Taupo. With him were Roger Jones (technician), of Gore, John Thomson (mechanic), of Temuka, Grant Eames (mechanic), of Lake Ohau, and four Americans from McMurdo Station.

Travelling with two dog teams and a motor toboggan, the eight men left Scott Base in fine weather with a temperature of minus 38deg Celsius. When they arrived at White Island after sledging across the permanent McMurdo ice shelf, they found the colony deserted.

SKELTON SUMMER

Between two glaciers in Antarctic "banana belt"

By K. R. SULLIVAN

Five boring, uncomfortable hours encapsulated in the gloomy, noisy, cavernous body of a United States Air Force Starlifter saw the transition from a humid, drizzling Christchurch to the white stillness of Antarctica. Arrival brought relief and elation at being able to walk about this strange wilderness.

The purpose of my trip was to be field assistant on a geological expedition to the Skelton-Koettlitz Glaciers, about 80 kilometres south-west of Scott Base. "The banana belt of the Antarctic", said the party leader, Dr David Skinner, but during the hectic days at Scott Base we had few opportunities to contemplate the prospects of balmy weather. As seems usual for most field parties, there was always so much to do and so little time.

November 1 came and two flame red United States Navy helicopters arrived to put us and our 5,500lbs of gear into the field. Our put-in site was a large outcrop of rock bounded by the Skelton, Cocks and Baronick Glaciers. On landing we had our first intimation of the tropical weather which we had expected, minus 21°C and a gentle 30-knot breeze. The 2ft high sastrugi, elegantly carved out of the hard snow were irrefutable evidence that the wind was no occasional visitor.

Undeterred, we chopped platforms for the tents, and as the last helicopter departed we hoisted our flag and began to settle in with only the wind and the cold Antarctic vastness as companions in our solitude. There were four of us in the party which had come to study the low-grade meta sediments of the Skelton and upper Koettlitz Glaciers and the hitherto unvisited Mt Cocks area which lay between the two glaciers. Barry Waterhouse was the other geologist and Gary Brehaut the field leader.

A few days of fumbling around in cumbersome down trousers and jackets in the biting, numbing, unceasing wind dispelled the tattered remnants of our illusions about "Banana Belt" weather.

K. R. Sullivan was a field assistant in last season's programme.

For all save two of our 24 days on the outcrop the wind was a constant companion. One grew accustomed to it so that the silence of its absence was quite eerie. The little flag flapping and snapping with defiant futility seemed to embody our transient relationship with this land—we might stay awhile but eventually the elements would triumph, fraying us, and our visit would have been the barest ripple on the continent.

Towards the end of our stay at this camp we had a flying visit from Hamish Raynham, the Scott Base leader who, in his capacity as returning officer, brought our voting papers for the General Election on November 29. When I was huddled in a polar tent the hurly burly of New Zealand political life seemed remote, unrelated to my present conditions, and our democratic right to vote a bit nonsensical.

Four days later, our geological work completed, we broke camp, lowered our already fraying flag, and set off down the Cocks Glacier to the Skelton, 715 metres below.

The two motor toboggans had a hard job pulling the three sledges over the

sastrugi, requiring us to cut a path in places. The drop got steeper and steeper and we suffered our first casualty when a sledge rolled, snapping one of our spare skis. The crux of the descent was reached in the lower part of the Cocks Glacier. It was an ice fall which we edged around at one end, manhandling and relaying the sledges and toboggans across and down the steep, glassy ice.

Although it was minus 13°C, everyone sweated as the heavy sledges were difficult to manhandle. By a combination of teamwork and hard labour the ice fall was behind us and all that remained were the large swales of bare ice that ran down into the Skelton. When we finally made camp we had taken 11 hours to cover six miles, but were safely down on the Skelton.

Once down, the wind died and the temperature rose. Apart from a blizzard lasting two days we had continually brilliant weather for a month, climaxing in a minus 2°C heat wave. The party worked its way down the glacier with little mishap, save for inadvertently wandering into a crevasse field, until Teall Island was reached.

A climb to the top of the island on one particularly crystal day produced a stunning panorama of glacier after glacier as we looked down the limitless ice shelf. Amidst this tumbling profusion of flowing ice and over-towering mountains the only sound that could be heard was the beating of one's own heart.

From Teall Island we turned north again and ran back up the Skelton, following in the famous footsteps of Fuchs and Hillary. On the way we had our first serious mishap when a sledge rolled onto David Skinner's leg, badly wrenching his muscles. Fortune must have been smiling on us, for no bones were broken and he was flown out for a week's rest at Scott Base. During his absence his place in the tent was taken by Dr Susan West who, by her enthusiasm and ability, quickly fitted into the party. "A really good bloke," as one member put it.

With Christmas coming we finished our circuit of the Skelton and returned to the mouth of the Cocks where we waited to be picked up by helicopter and ferried up to the slopes of Mt Cocks. While waiting, the fine weather finally ran out, and a series of overcast days brought snow and a continuing fall in temperature.

Our lift was completed during a short break in the weather and somewhat envious eyes watched "Gentle 18" flying back to base, and its series of Christmas parties while we were faced with the prospect of further snow falls.

For seven and a half consecutive days we had a white Christmas as snow fell in a complete whiteout. In the continual effort to dispel the boredom and frustration of these days we spent long hours dreaming of the cold beer and hot days of a New Zealand summer.

Towards the end of the year the weather relented and in a 24-hour effort we made the first ascent and traverse of Mt Cocks, 2438 metres, with 1976 arriving as we were just below the summit.

With the New Year we were on the move again. Under clear skies and over hard, firm snow our expedition sledged across the Cocks névé and through a pass into the head of the Koettlitz Glacier. With the ideal conditions and beautiful mountains close by the sledging was perfect.

Once in the Koettlitz the weather again closed in and remained cold and indifferent for the remainder of our trip. After working around Hooper Crags we moved down to the Foster Glacier where, after 77 days in the field, we were lifted back to Scott Base and the civilised delights of warm showers and clean clothes.

During out time in the field we enjoyed an average temperature of below minus 10°C and were able to spend only 58 per cent of our time working. But despite the bad weather we managed to complete most of the project.

THE READER WRITES

Sidelights of Antarctic Research

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

MEN WITH BYRD

Sir,—Nearly 50 years have passed since the two ships of Rear Admiral Richard Byrd's first Antarctic expedition sailed south from Dunedin. The young men aboard the City of New York and the Eleanor Bolling are now veterans, and their ranks are growing smaller as the years go by. Most of them were Americans; there were also 19 New Zealanders.

New Zealanders helped to crew the ships of Byrd's second expedition in 1933-35. Thirty-six sailed in the Jacob Ruppert and the Bear of Oakland, and three wintered at Little America. The service of the New Zealanders, and their contribution to the success of both expeditions, is not generally known, and is in danger of being forgotten.

Perhaps it is not too late to find out more about these men. How many of the 55 are still alive, and where are they now? Their experiences are worth recording for they are as much a part of New Zealand's short history of Antarctic activity as the men who established Scott Base.

The first New Zealanders to join Byrd were Percy J. Wallis, who served as a sailmaker aboard the City of New York, and R. Parks, assistant cook on the Eleanor Bolling. Four men served with both expeditions, H. R. Young, a former Royal Navy diver (City of New York and Little America), J. N. F. Newbold (Eleanor Bolling and Bear of Oakland), A. B. Robinson, who was third mate of the City of New York and second mate of the Bear of Oakland, and J. Robinson (City of New York and Jacob Ruppert).

Young wintered with the second expedition, and assisted in the biological field work. Bernard L. Fleming was attached to Dr T. C. Poulter's scientific staff, and Dr L. H. Potaka replaced the original doctor, and was the first Maori to winter in Antarctica.

The Antarctic historian, L. B. Quartermain, listed all the New Zealanders—even the three stowaways found aboard the Jacob Ruppert—and mentioned some in "New Zealand and the Antarctic." The record needs to be brought up-to-date.—Yours, etc.

JAMES PIGG

PENGUIN EGG

Sir,—Dr Stonehouse's information on the Emperor penguin egg collected during Dumont d'Urville's expedition ("Antarctic," December, 1975, p.254) does not quite bring the story up-to-date.

The Norwich Museum did once have the egg, but in 1962 they presented it to the museum of the Scott Polar Research Institute where it is now displayed, appropriately enough, alongside a much later egg collected by Dr Stonehouse himself.—Yours, etc.

C. A. HOLLAND,
Curator.

ANTARCTIC BOOKSHELF

ANTARCTIC ADVENTURE. SCOTT'S NORTHERN PARTY

By

Raymond E. Priestley

Melbourne University Press and C. Hurst and Co., Ltd.
382pp. Two maps, 150 illustrations. N.Z. price $14.40.

This reprint of Sir Raymond Priestley's story of the experiences of Scott's Northern Party was planned before the author's death in 1974. But it is an appropriate tribute to an eminent scientist who is remembered by all who knew him for his patience, kindness, humility, and humour—qualities which helped him and his companions to endure their privations at Cape Adare and on Inexpressible Island.

"Antarctic Adventure" was published in 1914 by T. Fisher Unwin on the eve of the First World War. It has become a rare Antarctic classic because most of the stocks of the first edition were destroyed during the war. The reprint, which is identical, will bring the book to a wider readership. The only additions to the facsimile reprint are a four-page foreword by Sir Vivian Fuchs, and four additional pages of "The Songs of the Northern Party".

Only the photographs have suffered in the new edition. They have lost some of the clarity of the originals. Most of the photographs were taken by Dr Murray Levick, who was the official photographer to the Northern Party.

It is surprising that Levick and Priestley obtained such good photographs despite the conditions in which they had to work. Priestley is right to claim that some of the results would not have disgraced Ponting himself. He says that the good results, in spite of the long period between exposure and development, were obtained because the films and plates remained frozen practically the whole time, and chemical reaction was retarded so much as to become inadequate to produce any perceptible result.

In his letter of January 23, 1911, to Commander Victor Campbell (the leader of the Northern Party), Scott forsaw the possibility of the party (originally known as the Eastern Party) facing a second winter away from Cape Evans. When the Terra Nova was prevented by ice from relieving the Northern Party in the autumn of 1912, the six men were completely unprepared for this eventuality.

Priestley mentioned three requisites for their survival—hot food, light, and shelter. The few penguins and seals at Inexpressible Island provided food and fuel. Light was provided by a blubber lamp improvised from a tin and a piece of string for a wick. Shelter was in the form of an underground igloo or cave, deep enough to lie in but not to stand up in properly.

The roof of the cave often threatened to collapse. Ventilation was always a problem. The meagre food available was rationed with a discipline without which more of the party would have survived.

In the spring they emerged blubber-soaked and weak. Petty Officer Browning was close to death. A change of clothing all around, carefully deferred until this time, lifted morale. In December, 1912, the party reached Cape Evans after sledging 260 miles. For part of the journey the men had to eat frozen penguin flesh.

Priestley's narrative reflects the cheerfulness, positive approach and sheer will to survive, which seem to be the hallmarks of many of these early explorers.

—R.G.M.

OBITUARY

Last survivor of smallest Antarctic winter party

Fifty-five years ago two young Englishmen joined an expedition to Graham Land. Two of the four members of the rather grandly named British Imperial Expedition abandoned the project and returned to England. T. W. Bagshawe, a 19-year-old geologist, and Lieutenant M. C. Lester, R.N.R., a navigator, who was in his early twenties, remained. They became the smallest party ever to winter in the Antarctic, and the first British party to do so in Graham Land.

For more than a year Bagshawe and Lester lived at Water Boat Point on the Danco Coast of the Antarctic Peninsula under the most primitive conditions. They built a hut from an old decked-in ship's boat and packing cases, and lived for nine months on little but minced seal and penguin breast. In the most difficult conditions they carried out a restricted but most gallant programme of scientific work.

Thomas Wyatt Bagshawe, the last surviver of the tiny expedition, died at Worthing on January 28 this year at the age of 74. More than 35 years have passed since he was persuaded by Professor Frank Debenham to write an account of the expedition. His modestly told story, "Two Men in the Antarctic," reveals how much he and Lester achieved by quiet determination and perseverance in most trying conditions.

Bagshawe was educated at Rugby, and Gonville and Caius College, Cambridge. In 1920 he joined J. L. Cope's British Imperial Expedition. This expedition originally was conceived on a grandiose scale by Cope, who had been doctor and biologist with the Ross Sea Party of Shackleton's Imperial Trans-Antarctic Expedition of 1914-1917.

POLE FLIGHT

Cope's plans included the use of 12 war surplus Royal Air Force planes to fly in relays from New Harbour, on the west coast of McMurdo Sound, to the South Pole, and a three-year circumnavigation of the Antarctic Continent. When this ambitious project failed because of insufficient finance, Cope had to be content with a much smaller expedition — himself as leader, Captain G. H. Wilkins, later Sir Hubert Wilkins, as second-in-command, Bagshawe and Lester.

Norwegian whalers were to take the party to the Weddell Sea coast of Graham Land. There Nordenskjold's old hut on Snow Hill Island was to have been used as a base, and a sledge journey made southward to prove a connection between Graham Land and Filchner's discovery of Prince Luitpold Land on the other side of the Weddell Sea.

But ice conditions in Antarctic Sound prevented the landing of the party at Hope Bay. Therefore, in mid-January, 1921, the four men were landed with their stores in Andvord Bay (68deg 48min S., 62deg 43min W.) on the west coast of Graham Land. The landing place which they called Water Boat Point, was at a spot known to the whalers as Paradise Bay, where an old decked-in ship's boat was drawn up on a low gravel spit.

Attempts were made to find a practical route for sledging the stores across to the eastern coast. But they were unsuccessful because the whole of the mountainous tableland, rising 6000ft to 8000ft in the neighbourhood, was be-

tween the party and its objective. After about 30 miles of the coastline had been surveyed in cloud and fog, it was decided that Cope should return to Montevideo and obtain a ship the next year to transfer the stores to the other side of the peninsula. Wilkins decided to abandon the expedition and return to England.

Wilkins and Lester then set out in the expedition's boat in search of the Norwegian whalers. Bagshawe was left at Water Boat Point to continue the meteorological observations. They returned a week later, and on March 4 Wilkins and Cope departed, leaving the two young men to spend the winter.

Why did Bagshawe and Lester decide to remain in the Antarctic, and not follow the example of their more experienced elders? It appears they had come south with the intention of wintering, and were determined to remain whatever the consequences. Captain O. Andersen, of the whaling factory ship Svend Foyn I, visited them on March 5, and tried to pursuade them to return to Europe with him. He took a fatherly interest in the two young men, and promised that if Cope did not return in 1922, he would come to their relief himself.

HUT OF SORTS

After the whalers left the two men had to decide the problem of accommodation. A hut of sorts was built from the old boat and packing cases; the problem of a leaking roof was never overcome, and the stove made out of an oil-drum gave constant trouble.

Cope's organising powers were minimal. The expedition's stores and equipment were deficient in quality and quantity. Bagshawe and Lester had only one fork between them. It was part of a present which Bagshawe had received before he left England. But there was an excellent supply of creme-de-menthe sweets. They were a welcome change from the monotonous diet of penguin eggs, minced seal meat, and penguin breast.

In the year and a day Bagshawe and Lester spent at Water Boat Point they collected an incredible mass of scientific material. They took two-hourly meteorological readings from 8 a.m. to 8 p.m. every day, and kept meteorological, ice, and natural history logs. For 40 days on end hourly tidal observations were made day and night, which allowed them the minimum of sleep.

PENGUIN EGGS

Apart from this the two men were kept busy cooking and attending to their stove, and supplying themselves with food. In his book Bagshawe indicates their devotion to science. He says that Lester "very considerately" put aside any idea of eating the first penguin eggs of the spring until there were enough for scientific observation.

Cope did not return, but Sir Ernest Shackleton, before leaving in the Quest on his last Antarctic expedition, undertook to go to the relief of Bagshawe and Lester. Wilkins had joined the Quest expedition after he returned to England. However, the explorers were relieved on January 13, 1922, when Captain Andersen arrived with Mr A. G. Bennett, the Falkland Islands Dependencies magistrate.

After his return to England Bagshawe had no close association with the Antarctic, although he attended many Antarctic Club meetings in later years. His story of the expedition was published in 1939, and the Bagshawe Glacier on the Danco Coast is named after him.

From 1925 to 1947 Bagshawe was a director of Bagshawe and Co. Ltd., Dunstable. He was honorary curator, and later honorary director of the Luton Museum from 1928 to 1947. During the Second World War he served with the Royal Air Force Volunteer Reserve, and in Combined Operations. He was High Sheriff of Bedfordshire in 1949.

Veteran dog driver sledges on

After more than 45 years Norman D. Vaughan, one of the veterans of Rear-Admiral Richard E. Byrd's first expedition to the Antarctic in 1928-30, still retains his enthusiasm for dog sledge driving. This year he competed for the third time in the gruelling Alaskan 1049-mile dog sledge race from Anchorage to Nome. At 71 he was the oldest man in the race.

Forty-seven years ago Vaughan was in charge of the dogs of Byrd's Geological Party, which sledged 1525 miles from Little America to the Queen Maud Range and back. This party, led by Dr Laurence M. Gould, who was Byrd's second-in-command, made one of the longest and most important sledge trips in the interests of pure science.

Vaughan was one of several young Americans who went south with no previous Antarctic sledging experience, but developed extraordinary skill in dog handling. He was one of the three Harvard students whom Byrd christened the Three Musketeers. The others were Fred E. Crockett and Edward E. Goodale.

These three gave up their university studies and spent a winter in the hills of New Hampshire learning to be dog drivers. Their mentor was Arthur T. Walden. a veteran sledge driver in the Alaskan gold rush days. Then the four men went south to New Zealand with the expedition's 94 dogs in the Norwegian whaling factory ship, Sir James Clark Ross.

In Dunedin, Vaughan was one of a team which worked for nearly two weeks to provide a new diet for the dogs which developed signs of distemper while in quarantine. The team made 25 tons of pemmican biscuit to a new formula which restored the dogs to health. Only four died.

Mechanical transport, except for aircraft, played only a minor part in the first Byrd expedition, and Vaughan and his companions made some remarkable trips to support the flight to the South Pole, and the scientific work of the expedition. Storms and low temperatures made these trips hazardous for both dogs and men. Vaughan and a companion made several short trips on the Ross Ice Shelf from Little America, one in July when the temperature was close to minus 70deg Fahrenheit, and the cold froze the dogs' noses and paws.

Before the Geological Party began its historical journey, Vaughan took part in some record-breaking trips. On one a party sledged 99 miles in three days. It also established a record for an all night march in Antarctica—63 miles in temperatures dropping to minus 40deg F. Amundsen held the previous record of 62 miles.

The Geological Party went south to make glaciological and geological studies in the Queen Maud Range. It also provided weather reports for Byrd's flight to the Pole, and had a relief role if the flight failed.

During its stay in the Queen Maud Range the party ascended the west side of the Axel Heiberg Glacier, and found lichens at 6500ft on Mt. Nansen. It also found on Mt. Betty a cairn left by Amundsen on his way back from the Pole 17 years earlier.

On the return journey Vaughan's skill as a dog handler helped to bring the party back safely to Little America. The party was running short of dog food, and was held up by crevasses and fog. When the six men returned after 77 days in the field 21 dogs remained of the 47 with which they started.

After his return from the Antarctic Vaughan had his own advertising business. He gave this up temporarily to organise the supply of dogs for Byrd's second expedition in 1933-35, but could not go south again.

In 1954 Vaughan turned his attention to dog sledge driving in Alaska. He was the first outside entrant in the North American Dog Sled Derby, which is run over short distances out of Anchorage. Later he was manager of a freight camp on the Alaskan oil pipeline project.

His first entry in the Anchorage-Nome race was in 1974 when he was a maintenance man at the University of Alaska. He was 70 and was given the race number of his age. He entered the race again last year, but had to withdraw because of severe frostbite. His boots were frozen solid when he was caught in the overflow while crossing a river.

This year Vaughan started in the race, but was missing for several days when he did not report at one of the check points 350 miles from Anchorage. After an air search he was located safe and sound at a lodge on the route. He had lost four of his dogs, and could not continue. Last reports were that he had gone to Boston to rest for a while. No doubt he will be back in the race next year.

Captain Kessler served north and south with Byrd expeditions

One of the small band of veterans who served with Rear-Admiral Richard E. Byrd in the Arctic and Antarctic died in Richmond, Virginia, on January 3 this year. Captain Charles L. Kessler, who was 72, was a member of the United States Marine Corps when he served as a volunteer with the expedition to Spitzbergen from where Byrd, with Floyd Bennett as pilot, flew to the South Pole on May 9, 1925. After service in China, he went to the Antarctic as a civilian volunteer with Byrd's first expedition of 1928-30.

Captain Kessler was a member of the crew of the Eleanor Bolling, one of the expedition's two ships, and known to those who sailed in her as the "Evermore Rolling." He made four trips between Dunedin, New Zealand, and the Bay of Whales, and assisted in the construction of Little America I. In 1960 and 1962 he returned briefly to the Antarctic as an observer for the United States Navy.

During the Second World War Captain Kessler served as a naval recruiting officer in Virginia. After the war he entered the United States Naval Reserve with the rank of commander. From 1942 to 1960 he was state adjutant of the American Legion. In 1960 he returned to active duty as director of the Selective Service in Virginia. He retired in 1970 and in 1971 retired from the Navy after 30 years' service.

An active member of the Antarctican Society, Washington, Captain Kessler lectured widely on Antarctica. He was also a member of the Explorers Club and the Adventurers Club, of New York.

Kessler Peak (83deg 37min S., 167deg 50min E.) was named after Captain Kessler in 1966. The peak, which is 65m high, overlooks the Lennox-King Glacier in the Queen Alexandra Range. The Lennex-King Glacier flows into the head of the Ross Ice Shelf.

Scott Base has a sledge dog population of 23. Last winter several dogs suffered frostbite as a result of wind chill in the abnormally low temperatures. This winter they have the protection of kennels built for them by Mike Wing, the dog handler. Three pups, Karen, Muff, and Betty, born early last season, have grown into strong dogs, and took their places on the trace in April when the men exercised themselves and the dogs on outings despite the cold.

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

The New Zealand Antarctic Society (Inc.)

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

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

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

You are invited to become a member, South Island residents should write to the Canterbury secretary, North Islanders should write to the Wellington secretary, and overseas residents to the secretary of the New Zealand Society. For address see below. The yearly membership fee is NZ$3.00 (or equivalent local currency). Membership fee, overseas and local, including "Antarctic", NZ$6.50.

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