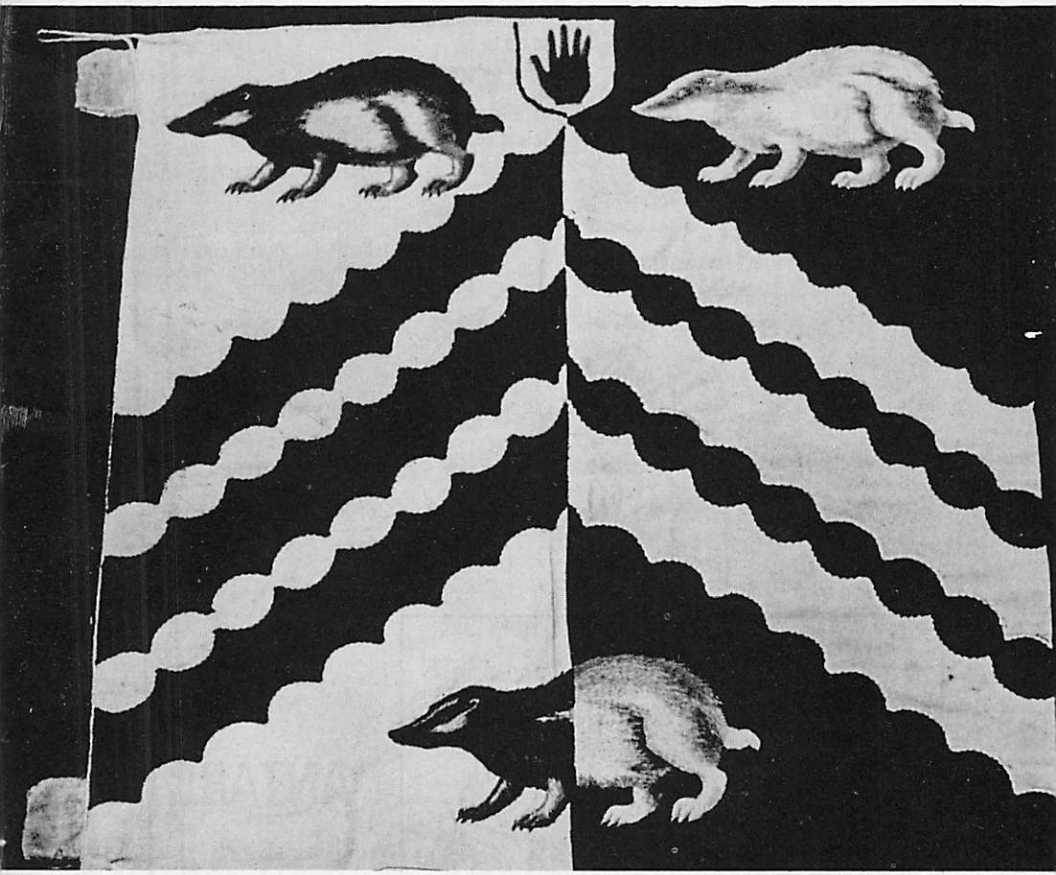
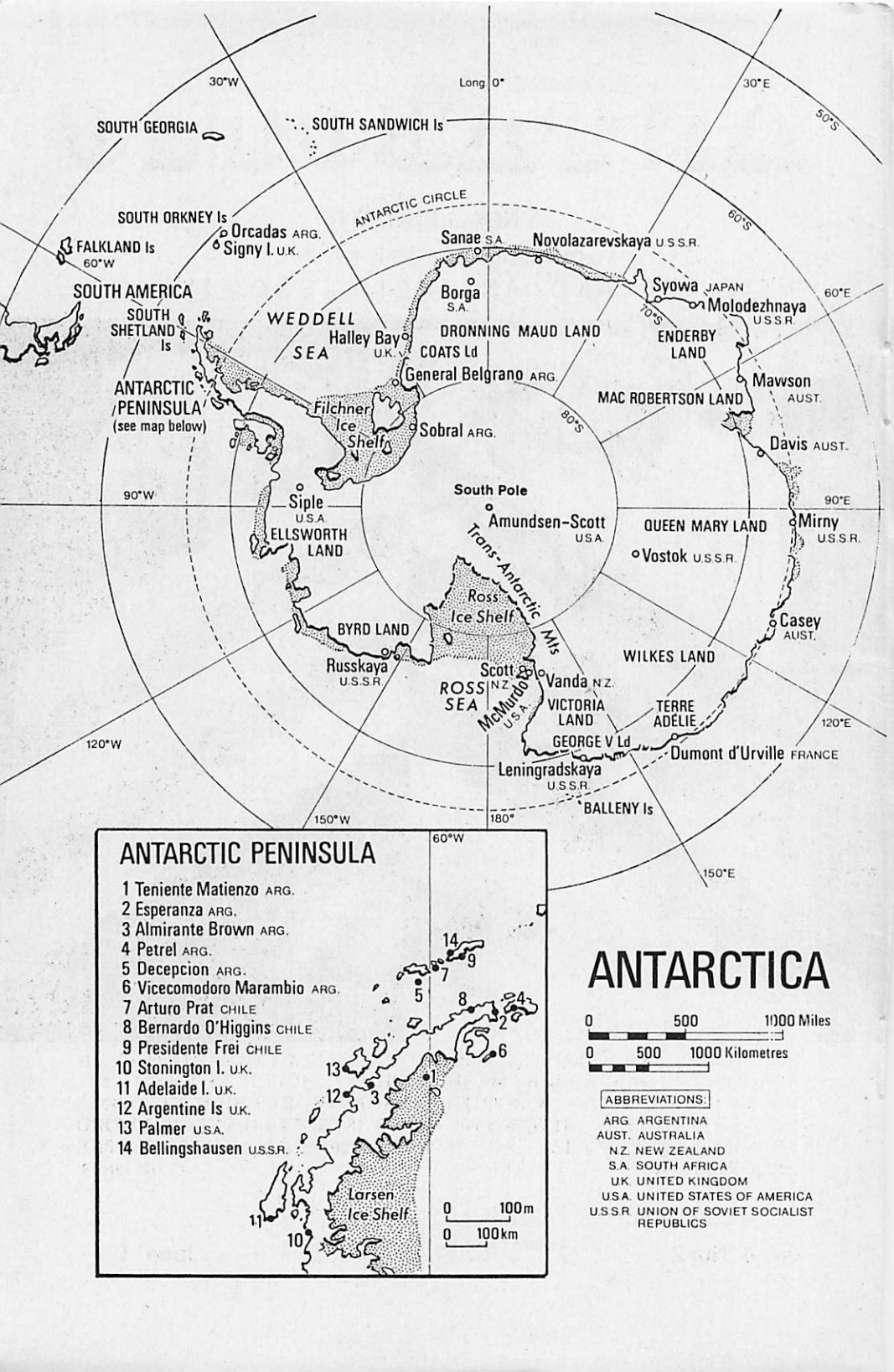
ANTARCTIC

A NEWS BULLETIN
published quarterly by the
NEW ZEALAND ANTARCTIC SOCIETY (INC)



SIR PHILIP BROCKLEHURST'S PERSONAL SLEDGING FLAG, NOW ON LOAN TO THE CANTERBURY MUSEUM, CHRISTCHURCH, NEW ZEALAND. BROCKLEHURST, WHO WAS THE LAST SURVIVOR OF SHACKLETON'S 1907-09 EXPEDITION, DIED IN 1975. BROCK IS THE OLD ENGLISH WORD FOR BADGER, AND THE FLAG DISPLAYS THREE BADGERS FROM THE BROCKLEHURST COAT OF ARMS. Photo by "THE PRESS"

Vol. 8, No. 2 Registered at Post Office Headquarters. Wellington, New Zealand, as a magazine. **June, 1977**



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. 8, No.2 | 86th ISSUE | June, 1977

Editor: J. M. CAFFIN, 35 Chepstow Avenue, Christchurch 5.
Address all contributions, enquiries, etc., to the Editor.

CONTENTS

WINTER DIARY

Daily Darkness and Cold On Ross Island

Winter darkness and low temperatures are now the daily experience of New Zealanders and Americans in the Antarctic. The men at the Amundsen-Scott South Pole Station, who saw the sun depart in March, were the first to feel the bite of winter in that month when the temperature dropped to minus 91deg Fahrenheit, and then to minus 92deg in April. Last month they had an unexpected "heat wave" — the temperature rose from minus 98deg to minus 80deg.

On Ross Island 1327km to the north 78 Americans and 10 New Zealanders had slightly more sunshine than the 21 men at the Pole Station — the sun departed a month later. But they were not exempt from winter's cold. By the end of last month temperatures of minus 40deg were being recorded, and the last two weeks brought high winds and several inches of snow.

Record low temperatures were set at the Pole Station last year to make it the coldest since 1957 when men first wintered at the Pole. The average daily temperature was minus 50deg F. This year there are 18 Americans, two New Zealanders and one Russian at the Pole Station, and so far they have experienced temperatures approaching the record lows of 1976.

When the sun dropped below the horizon for the last time on March 29 the men at the Pole had their warning of a touch winter — a temperature of minus 91deg F. Easter brought temperatures of minus 85deg, and a few days of twilight before complete 24-hour darkness set in.

SPECIAL DAYS

Heating, lighting, and plumbing are the main concern of the men at the Pole each winter when temperatures begin to drop sharply. But life is not all problems — celebrations of special days help the men to endure the isolation, cold, and darkness.

Easter Day was celebrated in grand style with a gargantuan feast — the climax to a whole week of cooking by the station cook, Dennis Boucher. The feast was followed by the annual South Pole Easter egg hunt.

In Washington children hunt for Easter eggs in the grounds of the White House. At the South Pole the eggs had to be found on the ice where the Pole Station stands. The prize-winner was Brad Halter, of the National Oceanic and Atmospheric Administration, who is doing geophysical monitoring for climatic change this winter. He found an egg which released him from "house mouse" duties for the rest of the week.

BAKING PROBLEM

May was a month of problems as well as low temperatures. First of all Dennis Boucher had trouble trying to make Russian bread to make the station's exchange scientist, Dr Alexander Zitsev, feel more at home. The recipe called for a whole pound of yeast in a batch of leaves, but the dough refused to rise.

Dennis Boucher's problem was not a new one at the Pole. When the first 18 men wintered there in 1957 the cook's cakes were persistently flat. The American makers of his cake mix were so upset that they baked their produce in an aircraft at 2743m — about the same altitude as the Pole Station — and asked Chet Seagers to add some flour to his

cake mix.

But Dr Paul Siple, scientific leader at the Pole then, says in his book, "90 South", that the blunt truth was that there was nothing wrong with the cake mix. "The Navy had simply failed to instruct Segers in the art of high-altitude cooking."

Not long after the Russian bread episode Dennis Boucher had a rest from worrying about his dough, and Dr Zaitsev had to change over from geomagnetic to culinary problems. The cook broke his leg, and all hands but the cook this time were called on to provide meals. With 18 Americans, two New Zealanders, Simon Norman and Lloyd Anderso, and Dr Zaitsev, there was a variety of menus.

FILM TROUBLE

Nine days after his accident Dennis Boucher was back at his hot stove. But his broken leg became a minor matter compared with the next domestic problem — the prospect of no movies. There are 200 films at the Pole Station for screening during the winter team's 250 days of isolation, but they are useless without a workable projector.

Last month efforts to keep on film projector in service by cannibalising parts from another seemed likely to be useless when the light bulb showed signs of giving up the ghost. There are no spare bulbs at the station, and no aircraft will call there until November.

On May 25 when everyone was watching an appropriate film "Some Like It Hot", the bulb seemed to be ending its useful life. But after another screening of a flickering film on May 28 the electronics technicians came to the rescue. They were able to adapt a bulb from an old slide projector, and everyone settled back to enjoy the next film.

Winter at McMurdo Station has followed pattern since the last aircraft and ships departed in February. But the 77 men and one woman there have had lower temperatures, snow, and high winds, with fewer domestic problems. First signs of Antarctic winter were 40—know winds and a temperature of minus 28 F on March 29. Then the penguins and the killer whales departed from McMurdo Sound.

April heralded the approach of winter darkness. The sun dropped below the horizon for the last time at 12.45 pm. on April 24 when the station flag was lowered and brought inside for the rest of the winter. Two days later the temperature dropped to minus 21deg, and five inches of snow during the week left drifts up to 10ft high against station buildings.

On April 25 the Americans paid a call on their neighbours over the hill — 10 New Zealanders at Scott Base. Eleven officers and men attended the New Zealanders' Anzac Day service when flags were also lowered for the winter. In the same month there was an exchange of cooks between the neighbours.

Last month twilight began to give way to the perpetual darkness, and the month ended with high winds, just over four inches of snow, and a temperature of minus 40deg. As the winter becomes harsher the sea ice in McMurdo Sound becomes thicker. By the end of the month it was nearly one metre thick.

SCUBA DIVING

Winter has not stopped one scientist from continuing his studies of the marine life under the ice in McMurdo Sound. Last month Messrs J.S. Oliver and P. Slattery, of the Scripps Institution of Oceanography, assisted by Petty Officer E.O. Bujanovsky, were still scuba diving through holes cut in the ice.

Ross Island's population this winter includes one lone woman, Mrs Donna Oliver. She shares the same scientific interests as her husbands but she works in the laboratory instead of under the ice. And during the winter she has been setting psychological tests for the men at Scott Base to answer.

Although the New Zealanders at Scott Base were able to make several field trips

before the last few weeks of daylight ended, they were reminded in March when the temperature dropped to minus 42deg Celsius, that last year was the coldest at Scott Base since records were first kep 20 years ago. Another reminded was a temperature of minus 43deg C at Windless Bight, 12km from the base when three men went there to check on the auroral telemetry station.

SOUTHERN LIGHTS

Last summer a small telemetry station was installed at Windless Bight by the University of Alaska scientists as part of a project to determine the relationship between auroral activity in the atmosphere and minute changes in the barometric pressure. Data from three infrasonic recorders is correlated with information obtained from a new all-sky camera which since February 1 has been photographing the Antarctic auroras — the Southern Lights.

Kevin Weatherall, senior science technician (Milton), who is in charge of the new programme went to Windless Bight in March with Ian Minchington, science technician (Auckland), and Ian Johnstone, postmaster (Taihape), to check the equipment. Despite the temperature of minus 43deg C the two Ians spent a comfortable night in a snow trench.

After the field trips the Scot Base men concentrated on outside tasks before the darkness closed in. The husky pups, Hansen Cherry, enjoyed their last few weeks of freedom before being chained up for the winter. Next season they will be working dogs with their elders. Indoors the men becane their winter hobbies, which range from leather work to 8mm movies, photography, rock cutting and model making.

SECOND WINTER

This winter the Scott Base leader and base engineer is Jim Rankin, of Kumara, who knows what an Antarctic winter is like. He spent his first as base engineer in 1971. Before the summer ended he joined the exclusive club of Antarctic swimmers, taking three swims in the freezing water of Lake Vanda during a week as "caretaker" at Vanda Station.

In his April newsletter Jim Rankin reported that the cook, Roel Keizer, celebrated his 22nd birthday on the first day of the month. A Christmas cake was converted for the occasion, and equipped with the required number of candles. Easter was a quiet and relaxing time, although on Easter Monday the leader, the postmaster, the officer in charge at McMurdo Station, Lieutenant-Commander John Barnes, and two American servicemen, visited the crashed Constellation aircraft some kilometres southwest of the base on the ice shelf.

Two events recorded in the April newsletter were the Anzac Day service on April 25, and a small ceremony to remember the 65th anniversary of the death of Scott and his companions on March 29, 1912. For the anniversary the deputy-leader, Ian Booker, prepared and read an extract from Scott's writing. A toast was drunk to all early explorers, and there was a second toast proposed by Ian Johnstone to all those who have followed since t Antarctica.

On Anzac Day a short service was held in the mess. A brief historical record of how the day was named, prepared by Rod Fearn, science technician (Auckland), was read, and after another reading and a prayer the New Zealanders and their American guests moved outside to the rather bleak vicinity of the base flag pole.

Ian Minchington lowered the New Zealand flag to half-mast, and George Money, the Post Office radio technician from Christchurch, did the same with the Post Office flag, while Ian Johnstone recited a verse by Laurence Binyon. Then the rather tattered flags which have been flown since the 20th anniversary of the establishment of the base on January 20, were brought inside.

VISITS EXCHANGED

Scott Base is only about 4km from McMurdo Station, and there is always

an exchange of visits between the neighbours. In April the McMurdo Station doctor called to check the New Zealanders' blood pressure and other details, and Antarctica's married couple, John and Donna Oliver, came to dinner. Later one of the American power house engineers arrived with hair-cutting equipment, and attracted six customers. The other four kept their long hair.

In April the temperatures took a downward turn with a minimum of 38.5deg C recorded, and 55-knot winds made Pram Point fairly bleak. For the second year the sea ice in front of the base has remained in place. Winter Quarters Bay over the hill has been clear since January, but lower temperatures have caused the ice to reform until it is moved out again by each gale. During the clear sea periods "sea smoke" covers the open water to a height of nine to 12m.

On many days in April the men at Scott Base observed mirages to the South in the Minna Bluff, White and Black Island area, and the Ross Ice Shelf. Auroras were seen on most clear nights, but they were white in colour and not spectacular.

Domestic tasks kept the team busy during the month. The long-awaited flush toilets were installed, more electrically-heated drain pipe was installed, and vehicles were overhauled. In between painting the interior of the new field store and other tasks, the dog handler, Richard Wills (Christchurch) and George Money prepared winter rations for the huskies.

Last month the weather was generally kind to the winter team. There was a warm spell at the beginning of the month lasting about a week, when the maximum temperature was a mild minus 10deg C. After that the average was around minus 30deg with the coldest temperature 45.5deg. The wind averaged 25 knots with a peak gust of 56 knots on May 3.

During the month the winter isolation was relieved by a radio call from the main Soviet station, Molodezhnaya, on the Prince Olav Coast of Enderby Land, about 3000km from Scott Base, and conversations with Vostok, the Soviet station 1931km away on the Polar Plateau, and the Australian station, Casey, on the Budd Coast of Wilkes Land about 2000km from Ross Island. To the north in the sub-Antarctic the men talked to other New Zealanders at the meteorological and ionosphere station on Campbell Island.

Vostok, the coldest place on earth, reported a temperature of minus 80deg, and Casey reported winds gusting to 137 knots. Contact with the 23 Australians there faded midway through the link — Scott Base was treated to a magnificent auroral display that night — but more calls were made to other stations this month.

Mid-winter's Day in Antarctica marks the beginning of the end of winter isolation for the New Zealanders at Scott Base, and men of other nations at bases round the continent. Traditionally it is a day on which the New Zealand winter team exchanges gifts. Early this month the 10 men started making their gifts. Each man worked while doing his turn at "house mouse" duties. With nobody around to see what was being done, each gift will be a complete surprise to the recipient.

COLDEST MAN

Perhaps the coldest man in Antarctica this winter must be a Fijian, Ulai Nagatalevu. He is a radio operator at the Australian station, Casey. He is not the first Pacific Islander to work in the Antarctic. One of the Post Office clerks at Scott Base last summer was a Samoan.

Tam Leota, who comes from Wellington, apparently likes island life. After he left Ross Island he went to the Chatham Islands, where he had been stationed previously.

A new United States Coast Guard icebreaker, the Polar Star, seen here under way in Puget Sound, will take part in American Antarctic operations for the first time this summer. She will work with the veteran icebreaker Glacier, which first operated in Antarctic waters 22 years ago.

U.S. Coast Guard photo

Many Apply to Work in Antarctica

More than 500 men and 28 women want to work in the Antarctic next season with the New Zealand research programme. Twelve of the 543 applications received by the Antarctic Division, Department of Scientific and Industrial Research, have come from overseas — four from Australia, four from the United States, three from Britain, and one from Canada. One woman lives in Britain, and another in the United States.

Six are prepared to spend the winter at Scott Base cooking for its 10 inhabitants, and 87 altogether want to winter in the Antarctic. There are 115 applications for jobs as field assistants.

Between 30 and 40 jobs, depending on the extent of the research programme, are available next summer at Scott Base, Vanda Station, or with field parties. The 543 applications have been reduced to a short list of 200 applicants, who were interviewed last month and early this month.

Damage to Relics at Historic Huts

Gradual destruction by erosion of fragile boxes, bales, and tins in the garage and stables area, and along the sides of Shackleton's hut at Cape Royds, was noted by two caretakers from the New Zealand Antarctic Society who spent four weeks working at the three historic huts on Ross Island last season. The effect of the elements on exposed historic objects was confirmed by a comparison with photographs taken in 1948 and 1957.

Distant stores on a hill-top 150m east of the north end of Scott's hut at Cape Evans, which are in the worst possible windswept location, have also suffered from the force of Antarctic gales. When the two caretakers, Messrs A.W. Burton, of the Canterbury branch, and J. Sutton-Pratt, of the Wellington branch, arrived on December 21, they found nearly 500 tins of foodstuffs strewn over a wide area.

Each summer since 1969 caretakers from the society have worked on the huts for the Antarctic Division, Department of Scientific and Industrial Research, which is responsible for their maintenance. Because of lack of air transport caretakers could not be sent south in the 1975-76 season, and Messrs Burton and Sutton-Pratt had to cope with the results of the exposure of the huts to the elements for two consecutive winters.

As in past seasons the caretakers spent much of their stay between December 9 and January 5 removing accumulated snow and ice from the interior of the huts. Archaeology has become one of the duties of caretakers, and Messrs Burton and Sutton-Pratt uncovered many more relics, particularly from the stables area at Cape Evans. Also more than 200 items were found over a wide area outside the main door of Scott's hut.

First of the caretakers' tasks was to remove all the snow from inside the Discovery hut at Hut Point. The entrance passage was filled up to a depth of 170cms, and the snow had spread into the hut, covering the seal carcases there. Considerable quantities of snow and ice had accumulated in the false ceiling, and had to be removed. To prevent more snow drifting into the hut gaps, holes, and cracks all round it were sealed.

Snow had drifted along the entire length of the north verandah to an average height of 2m. About 7m of hard ice was also cleared from this area below the snow.

In the false ceiling two rusty relics were discovered, but there was no clue as to how long they had been there. One was a saw 60cm long, made by Disston and Sons, of Philadelphia. The other was a French sardine tin marked "Cuisson a l'huile d'olive pure" (cooked in pure olive oil), and made by Albert and Company, L'Orient.

Small snow patches were removed from Shackleton's hut at Cape Royds, and the storeroom which was too cold for its original use as Douglas Mawson's laboratory was also cleared of snow. Scoria was deposited to seal the storeroom from the snow which enters under the porch passageway.

Stores outside the hut on the south and east sides had been blown around considerably, and several cases had suffered wind damage. These, and other stores along the south and east sides were tidied and supported by rocks to prevent further dispersal by the wind.

Comparison of the stores on the north side of the garage, and the bales of pony fodder, with photographs of them taken in 1948 and 1957 showed signs of gradual destruction. Scoria was banked up at the base of these stores where it had been blown away earlier to prevent further undercutting.

In the 1974-75 season the weather was mild and the caretakers were able to clear much of the ice from the stables at Cape Evans. But all seven stables were filled with the snow and ice of two winters when Messrs Burton and Sutton-Pratt arrived on December 21.

When the caretakers left on January 5 nearly half of the ice had been removed. The stables were occupied by the Indian Army mules during the expedition's second winter. Begum's stable was cleared of ice to 30cm above floor level, and Abdullah's stable was cleared to floor level. Gulab's stable was cleared of ice to 30cm above floor level over three-quarters of its area, and a passageway 1m wide was cleared at the hut end to the north-west outer wall in Khan Sahib's stable.

BLUBBER STOVE

During their clearing of the stables Messrs Burton and Sutton-Pratt recovered a number of items, including a pony feed tin, pieces of blubber, fire bricks, part of a pony blanket, and seven lengths of rope. The blubber stove on which Oates and Anton Omelchenko, the Russian groom, prepared hot mash for the ponies was cleared of ice down to its base. A bandy stick 1m long (presumed to be a hockey stick) with the word Cheapside inscribed on it was put by the bunk of the Russian dog driver, Dimitri Gerov.

Because of the warm weather there was little snow in the stable-latrine area. Careful excavation brought to light a pony feed box, a glove and a pair of black socks, 50 feed tins, and a pick handle, among other items.

When Scott's men settled into their hut in 1911 Bowers built a stores annexe of food cases. This has practically disappeared over the years, but what has survived has collapsed considerably since 1957 as comparison with earlier photographs revealed to the caretakers.

Messrs Burton and Sutton-Pratt found much of the east end of the annexe buried in snow, but the original wall line was clearly visible. The stores, mainly flour boxes made of boards, had weathered well. These were used, weighted with scoria, and when useable, packed with salvaged tins to rebuild the wall to a height of 150cm, and for 3m westward.

Venesta plywood cases used to build the west end wall have disintegrated far more, and tins and artifacts were widely scattered. Sixty tins were recovered, and other items included a pick, sledge runners, and four fuel drums.

MAJOR TASK

Recovery and protection of the scattered distant stores was a major task. Tins of custard powder, jam, golden syrup, oatmeal, and biscuits, were assembled in cases and added to two piles, which were protected with rocks and scoria. Thirty of the 86 cases assembled were arranged in an irregular circle to protect natural stories debris — tins of all shapes and sizes which were by far in the worst condition.

There are three fuel dumps at Cape Evans. These were tidied and straightened. Snow was cleared from the front of the hut, although considerable ice remains, and the tarpaulin on the east side of the magnetic hut which had fallen, exposing the inside to blizzards, was put back and secured.

Pony Lake in front of Shackleton's hut was again a source of relics, and is expected to yield artifacts for some time because of the gradual fall in its level, estimated at 50cm in 1874. Messrs Burton and Sutton-Pratt recovered from the area three leather belts, glass bottles, metal barrel hoops, a gumboot, a leather belt, and a woollen sock, enamel dishes, and 30 sealed rusty tins among nearly 60 items.

Several excavations in what the caretakers described as the "venerable rubbish" area outside the main door to the hut at Cape Evans yield a rich harvest. Among more than 200 items were such things as a mousetrap, lamp wicks, an inkpot, a net-making needle, a dish cloth, a small kid leather glove, a toothbrush, a packet of needles, woollen wrist warmers, and two clothes pegs.

A striped pyjama jacket which took two days to free from permafrost had a label inside the collar: E.R.G.R. Evans H32. It now hangs above the bunk of Scott's second-in-command, Lieutenant Teddy Evans.

Beside Cherry-Garrard's bunk the caretakers placed a board, part of a venesta packing case. It was inscribed "Garrard" in black paint. Also outside the hut in permafrost the two men found a copy of the "Illustrated London News", much of it still readable, and a white rock with the letters DOIF on it in orange pink paint. It corresponded with other geological specimens, one marked DOIG in the quarters occupied by Frank Debenham, one of the expedition's geologists.

During the evening walks at Cape Evans Messrs Burton and Sutton-Pratt found one interesting item. On a flat rock on the eastern shore of Island Lake was a pickaxe identical to that found in the hut. It was inscribed "the Hard Grantrick (?) Co. Ltd, Sheffield — Universal 6 guaranteed steel". It was placed in the annexe.

OTHER ARTIFACTS

Future excavation and investigation of the annexe may bring other previously unknown relics to light. Messrs Burton and Sutton-Pratt saw through the ice two polar tents, one with only the frame left, a bicycle frame, wheels and pedals, two large picture frames, and a large butcher knife.

Another possible source of artifacts is the ice cave, which the caretakers located while at Cape Evans. It has a doorway of substantial timber believed to be mahogany. A vast amount of excavation would be needed, however, to find any relics.

There are three crosses on Ross Island erected to the memory of men who died in the Heroic Age of Antarctic exploration. Messrs Burton and Sutton-Pratt found that all were in sound condition. The cross on Hut Point is in memory of George Vince who died during Scott's first expedition. On Observation Hill is the famous cross erected in memory of Scott and his companions on the South Pole journey.

Not so well known is the cross on Wind Vane Hill, a small hill at Cape Evans where Scott's last expedition placed an anemometer. The cross there was erected in January, 1917, by E. Wild and A.K. Jack, members of the Ross Sea Party of Shackleton's Imperial Trans-Antarctic Expedition (1914-17) which lived at Cape Evans from 1915 to 1917. It commemorates three members of the southern sledging party who did not return to Cape Evans — A.L.A. Mackintosh, V.G. Hayward, and the Rev. A.P. Spencer-Smith.

Probably for the first time in 75 years electric light streamed through the windows of Scott's Discovery hut at Hut Point last month. For the benefit of the photography enthusiasts at Scott Base the winter leader, Jim Rankin, took a portable generator to the hut.

In his May newsletter Jim Rankin reported that the hut still seemed gloomy despite the electric light. "It was hard to picture the hut lit only by seal blubber torches and acetylene lamps as in Scott's day", he said.

U.S. Geological Studies in Marie Byrd Land

Geological and geophysical studies in Marie Byrd Land will be a feature of the United States Antarctic research programme for the 1977-78 season. The Ross Ice Shelf Project. which had to be terminated early in December last year because of drilling difficulties, will be resumed as will the Ross Ice Shelf Geophysical and Glaciological Survey which was not affected last season.

Next season United States glaciologists plan to drill to a depth of 100m at Siple Station, 2250km from McMurdo Station at the base of the Sentinel Mountains in Ellsworth Land. Deep drilling is also planned by the French at Dome C, the ice dome in Wilkes Land 1150km from McMurdo Station. American scientists will take part in the French project and United States Navy aircraft will provide logistic support.

Detailed geological and geophysical data and rock specimens obtained in Marie Byrd Land will be used to develop a geological history of West Antarctica. Field camps will be established for the scientists by Hercules aircraft of VXE-6 Squadron, which will fly buildings and equipment from McMurdo Station, and also helicopters for close support in the field.

Another project in Marie Byrd Land will be an aeromagnetic survey to study the Tertiary volcanoes of the area. The survey will be made from a specially-equipped Hercules aircraft.

DEEP DRILLING

Deep drilling and an extensive glaciological programme are planned at Dome C. A drilling site will be selected after a major radio-echo survey of Dome C by the National Science Foundation and the Scott Polar Research Institute, using the specially-equipped Hercules which has flown airborne radio echo-sounding missions in East and West Antarctica over five seasons.

A glaciological team headed by Dr Claude Lorius, plans to recover an ice core from a depth of 1000m. The teams's studies are part of the International Antarctic Glaciological Project, a study of the East Antarctic ice-cap by scientists of five nations. The Dome C area is the thickest part of the ice-cap, and the glaciologists expect to obtain a core which will probably contain the longest paleoclimatic record ever compiled.

ROCKET LAUNCHING

Rocket soundings of the upper atmosphere will be made from Siple Station next season. It is proposed to launch three Nike Tomahawk rockets during the summer. University of Maryland payloads aboard the rockets will investigate electron precipitation triggered by VLF radio wave emissions. Equipment for the rocket launchings was flown to Siple Station and installed last season.

Last season a radioactivity survey using airborne gamma ray spectrometry was made in the dry valleys of southern Victoria Land, and on the topmost Beacon sandstone layers of mountain ranges in the McMurdo Sound area. The survey, designed to assess the potential for uranium and thorium reserves in the area, will be continued next season as part of the evaluation of Antarctica's mineral resources.

Siple Station, established in 1970, will have new buildings under a metal arch in the next two seasons. Construction of the new station, which will accommo-

date eight men in winter instead of four, will start next season, and will be completed in the 1978-79 season. Materials for the new buildings were shipped south last season and then flown from McMurdo Station.

Another construction project next season will be the rebuilding of the camp at Williams Field on the ice shelf about 9.6km from McMurdo Station. The installation of equipment which will compact rubbish for dumping at sea will also be considered.

If the French can prepare a skiway, an attempt will be made next season to recover a Hercules aircraft which has been in Wilkes Land for nearly six years. The task is more difficult than the recovery of the three aircraft from Dome C in the last two seasons because the terrain is too rough for ski-equipped aircraft to operate safely.

On December 4, 1971, the remaining Hercules was badly damaged when taking off from the ice-cap. It was a support mission to a French scientific traverse party, and the accident occurred 241km from Carrefour, a small advance base 40km inland from Dumont d'Urville.

A final cargo of marginally contaminated crushed rock from the site of the nuclear power plant on Observation Hill, which has been dismantled over several seasons, will be shipped from McMurdo Station next season. The supply ships Schuyler Otis Bland took 6500 cubic yards of rock from the site last season, but because of space limitations another 2000 cubic yards had to be left behind.

Next season the United States naval support force expects to spend about $2.3 million in New Zealand for goods and services for its men in Christchurch and the Antarctic. Last season $1.8 million was spent. In recent years more supplies and equipment have been bought in New Zealand, and particularly in Christchurch instead of being shipped from the United States. Fresh fruit and vegetables, timber, industrial gases, beer and clothing are obtained locally. Last season cargo for McMurdo Station included 12,000 cans of beer, 300 survival parkas, 130 sets of thermal underwear, and 1000 pairs of fleece-lined slippers.

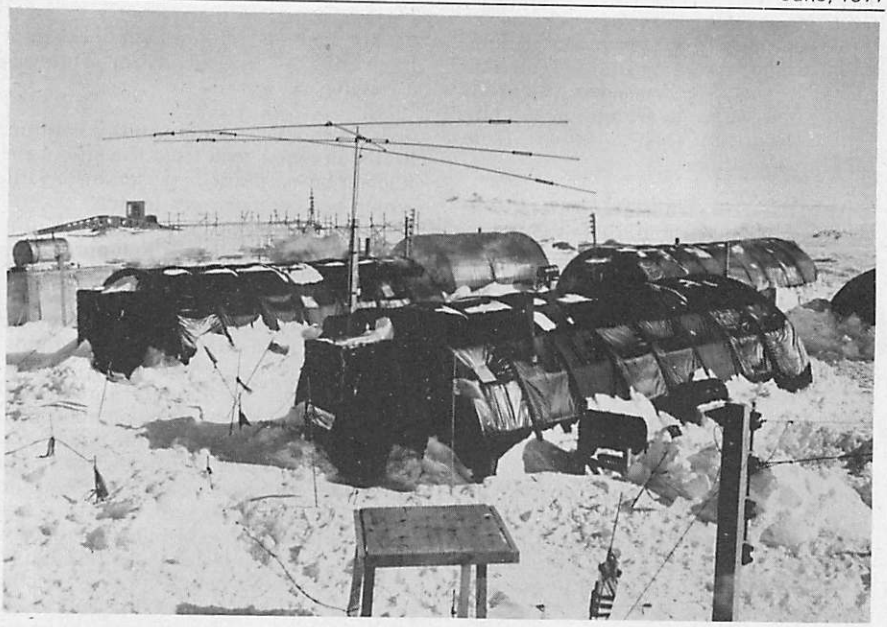
First Flights in September

To prepare for the United States scientific research programme for the 1977-78 season two ski-equipped Hercules aircraft of the United States Navy's VXE-6 Squadron will make six flights to McMurdo Station early in September. On this operation, known to the United States naval support force as Winfly, the aircraft will carry 142 passengers and 40,000lbs of cargo.

Most of the cargo will be mail, fresh fruit, and vegetables, which are eagerly awaited by the 78 Americans and 10 New Zealanders on Ross Island, who have been remote from the outside world since early February. Among the passengers will be scientists who will make an early start on summer research projects, and men who will prepare the annual ice runway in McMurdo Sound for the major airlift in October.

MISSING BREAD

Twenty-one years ago the United States announced plans to store 100 loaves of bread in Antarctica, and to test their edibility at the rate of one a year for 100 years. Since the announcement was reported in "Antarctic" (March, 1956) there has not been a crumb of news about the success or failure of the experiment. Where are the remaining 79 loaves?



United States Navy camp at Dome C on the polar ice-cap in Wilkes Land, 1150km from McMurdo Station. French glaciologists will conduct a deep drilling programme on the ice-cap with United States support in the 1977–78 season.

U.S. Navy photo

Norwegian Krill Research

Norway's first independent scientific expedition to Antarctica since 1960 found less krill in the eastern Weddell Sea last summer than it expected. Krill concerntrations were charted in the area with a fathometer aboard the 500-ton icebreaker Polarsirkel, which also carried out research along the coast of Queen Maud Land. Variations of up to 22km were noted on the coastal regions by the team aboard the icebreaker.

Organised and led by the Norwegian Polar Institute, the expedition spent two months in western Queen Maud Land and the Weddell Sea, and carried out studies of climatic changes, ocean currents, glacier movements, and other geophysical, geological, and biological relationships. By special permission of the Ministry of the Environment the expedition brought back five penguins and 20 Antarctic birds, and a 15m-long block of ice. The ice will be examined for chemical content and other particles, and the penguins will be studied by the Zoological Museum in Oslo for traces of pollutants.

On the way home the Polarsirkel called at Bouvet Island, which is about half-way between Queen Maud Land and Cape Town. The island has been a Norwegian possession since 1927, but the visit was the first by a Norwegian polar team since 1931. Geologists from the Norwegian Polar Institute who made a hazardous landing on the island from rubber boats defined it as an active volcanic area. They determined that the last eruption occurred as recently as 1957.

ANARE REPORTS

Geological Survey of Enderby Land

Aided by better weather geologists and geophysicists of the Australian National Antarctic Research Expeditions were able to make a thorough exploration of Enderby Land last season. The main summer field programme in 1976-77 was carried out for the second year running to the west of Mawson. It began on January 4 and continued until February 8, and almost 100 per cent of the geology, geophysics, and glaciology programmes was completed.

From their base at Mount King the scientists made flights in the fixed-wing Pilatus Porter aircraft and three Hughes 500 helicopters as far as Proclamation Island in the north, south to Kiri Nunataks, west to Molodezhnaya, and east to Mount Timbertops. In the season the helicopters flew 626 hours and the Pilatus Porter 148, compared with 528 and 148 in 1975-76.

Geologists worked in more than 300 localities in Enderby and Kemp Lands, and examined every significant rock outcrop. They collected 1600 rock samples, made gravity readings at 250 points, and magnetic observations at 20. Biological specimens were collected at various places of interest.

No economic mineral deposits were found during the survey, although small bodies of rock rich in iron oxide were identified. Special discoveries of scientific interest included the first reported Antarctic occurrence of eclogites — silica-poor rocks formed at high pressures at least 30km deep in the earth's crust — and the wide distribution in Enderby Land of the rock forming mineral sapphirine, another indicator of rock genesis deep in the earth's crust.

ICE THICKNESS

Glaciologists in the programme had a fruitful season. The Pilatus Porter flew nearly 9000km measuring ice thicknesses with the Antarctic Division's 100MHz ice radar. The area sounded extended from the coast to 60km south of the tractor route to Mount King, and from Dingle Dome in the west to Mawson.

These ice thickness measurements were part of a continuing investigation by Antarctic Division glaciologists into the total amount of ice crossing the 2000m contour between Mawson and the Sandercock Nunataks in Enderby Land. They will link up with earlier measurements made around the Lambert Glacier basin, and future planned studies eastward beyond Davis. Eventually they will enable the total ice outflow from a large section of Australian Antarctic territory to be calculated.

A second visit was made on July 11 to Proclamation Island, 120km north of Mount King, and off the north-east coast of Enderby Land. This was where Sir Douglas Mawson landed from the Discovery on the first cruise of the British, Australian, and New Zealand Antarctic Research Expedition, and where on January 13, 1930 he claimed sovereignty for Britain of Antarctica south of 65 deg S and between 47 deg and 73 deg E.

When two helicopter-borne parties visited the island for survey, geophysical, and geological work, they located Mawson's cairn and the proclamation, which was in a glass vial with a cork stopper. The vial was in a metal canister which was almost completely eroded.

Last season's visitors located the proclamation again, but found 50mm of water in the vial. After the sodden proclamation had been removed, dried, and photographed, it was placed in a new metal cylinder made by the Antarctic Division at its workshops in Melbourne. A carved wooden plaque found lying loose by the cairn in 1975-76 was located 3m to the south-west. It was returned to Australia, and a small replica was placed with the metal cylinder in the rock crevice where the original items were found.

Before they completed their programme nine members of the Enderby Land party flew from Mount King to the main Soviet station, Molodezhnaya, on February 3 at the invitation of the 21st Soviet Antarctic Expedition. The men inspected the station and took photographs. On February 4 the Pilatus Porter landed on the huge icestrip 5km south of the station, and returned with the three helicopters to Mount King in the afternoon.

COMBINED VOYAGE

Because of the damage to the Thala Dan on her first voyage of the season to Dumont d'Urville last December, and the delay for repairs in Melbourne, her programme of three separate voyages had to be revised. A combined voyage was made with Expeditions Polaires Francaises. The ship took the winter party of 23 men to Casey and five men to Dumont d'Urville, bringing back the summer parties from the two stations.

On February 1 the Thala Dan sailed from Melbourne, and reached Casey just over a week later. After the Casey party was installed, she departed on February 18 for Dumont d'Urville 1300km to the east, arriving on February 24.

Helicopters from the ship flew to Commonwealth Bay, the site of Mawson's 1911-14 expedition, on February 26. The hut at Cape Denison was still full of ice, and as the party remained for only hours no major work could be done. But openings in the roof were sealed with timber specially flown in for the purpose.

A cross was set up by Mawson's men near the hut in memory of Lieutenant B.E.S. Ninnis and Dr X. Mertz, who died on a sledging trip with Mawson eastward from Cape Denison. The visitors found the horizontal bar of the cross had moved downhill from the site. It was returned to a secure position alongside what remained of the cross. The wooden plaque on the cross was removed and brought back to Australia for preservation, and a brass replica fixed in its place.

When Mawson returned to his old base on January 5, 1931, during the second BANZARE cruise, he claimed formal possession of King George V Land for Britain, and left a proclamation in a container on a hill overlooking the base. This year the container was found to be rusted through. It contained drift and ice, and only frozen plastic was wrapped round the original document.

A copy was made of the proclamation and certified by all present. It was left with other papers in a small tin. The original has been brought back to Australia where it will be treated to ensure preservation. It will be copied and a new container made for return to Cape Denison.

After she left Dumont d'Urville the Thala Dan attempted to reach Commonwealth Bay so more work could be done on the hut. But when she was about 30km from the coast the force of the wind and sea was too great to allow her to get in, and she headed for Hobart.

STORMY WEATHER

Stormy weather with winds reaching nearly 70 knots on March 6 delayed the Thala Dan's arrival at Hobart until March 9. She departed the next day with a large contingent of visitors for Macquarie Island, and returned to Melbourne on March 22 with nine men.

When the Nella Dan reached Davis on the first continental voyage of the 1976-

77 season she could not complete her unloading between January 4 and 11 because of the ice between ship and shore could not support heavy machinery. Essential stores and equipment had to be manhandled to the base.

After the Nella Dan had picked up the Enderby Land party and the Davis and Mawson summer parties on her second voyage she made visits to two areas of particular scientific and historic interest — Gaussberg, an extinct volcanic cone on the coast of Wilhelm II Land, and the ice-free Bunger Hills on the Knox Coast of Wilkes Land.

Australia has 83 men and two women wintering at her three Antarctic stations on the continent, and the sub-Antarctic station on Macquarie Island. The officers in charge of the winter teams are P. Wohlers (Mawson), B.W. Seedsman (Casey), A.D. Parker (Davis), and R.B. Ledingham (Macquarie).

There are 28 men at Mawson, 23 at Casey, and 14 at Davis. The winter party of 20 on Macquaries Island includes two women — Jean Ledingham and Sarah Stevens. Dr Ledingham is the station doctor, and wife of the officer in charge; Sarah Stevens is one of the radio operators.

Helicopters from the ship placed eight geologists, geophysicists, and biologists on Gaussberg (350m) where they spent February 26 and 27. This volcanic cone's main geological interest is the potassium rich composition of the lava. Its geological age has been estimated at nine to 20 million years.

Gaussberg was discovered in February, 1902, by a sledging party of the Imperial German Antarctic Expedition (1901-03) led by Dr H.E. von Drygalski He named it after the expedition ship Gauss which became beset in the ice about 80km to the north on February 25, 1902, and remained in the ice all winter until February the next year.

Three men of the western party of Mawson's 1911-14 expedition were next to visit Gaussberg from the afternoon of December 23 to Boxing Day, 1912. They found two German cairns on top of the mountain, and left a message in the easternmost cairn. This year it was found wrapped in wax paper with a message in Russian inside a metal cylinder. The container was probably placed there by Soviet scientists in 1957 and replaces the original.

A group from the Soviet station, Mirny, flew to Gaussberg on February 20, 1956, and landed on the ice south of the mountain. Three of the group climbed Gaussberg the next day, collected rocks, and found the A.A.E. party's message in a rusty can on the eastern summit.

In 1957 a larger party from Mirny made a detailed survey of Gaussberg to a scale of 1:2500, the map being published in the Soviet Antarctic atlas. The ANARE visitors found the Soviet survey cairns and strands of nylon fishing line on the mountain, and also a quantity of timber and a few pieces of rusty iron.

ICE-FREE AREA

After the visit to Gaussberg the Nella Dan travelled 600km eastward to the north-central section of the Shackleton Ice Shelf. Two helicopters flew six men 70km south of the main ice edge to the ice-free Bunger Hills. The party spent about five hours there making a biological reconnaissance, and visiting the now unmanned Soviet-Polish station.

About 900 square kilometres of the Bunger Hills region are completely ice-free. A third is part of the "mainland", and the rest islands and sea-water islet. Both islands and mainland consist of low brown hills and contain many lakes ranging in salinity from sea to fresh water.

Frank Wild, leader of Mawson's western wintering party, was the first to sight the Bunger Hills on November 19, 1912, during the spring-summer journey eastwards from the party's base

on the Shackleton Ice Shelf. The next visit to the area was in February, 1947, when Lieutenant-Commander David E. Bunger, of the United States Navy's Operation Highjump landed his Marine flying-boat on one of the larger lakes. In the next summer a survey party from the icebreaker Burton Island camped for a week in Bunger's "oasis".

In January, 1956, the first Soviet Antarctic Expedition began a continuous investigation of the area, and Oasis Station, near Lake Figurnoye, was opened on October 15 of that year. The station was handed over to Poland in 1959, but after a short occupation was "mothballed" and then closed in 1966.

During the ANARE visit the two helicopters worked independently in the surrounding hills, and samples were collected from 14 sites. Most of the valleys visited were rich in plant life, 14 specimens of lichens being collected, and possibly three species of moss. The moss contained tardigrades, nematodes, and protozoa in large numbers. Algal mats from three fresh-water lakes were inhabited by copepods, rotifers, nemotodes, and tardigrades.

Only four skuas were observed in the area. But remains of snow petrels littered two of the valleys, suggesting that they probably nest in the area.

[This review of ANARE activities last season was compiled from material supplied by the editor of "Aurora", the ANARE Club journal. The editor of "Antarctic" is grateful for his assistance.]

Antarctic Division will be near Hobart

After nearly three years of discussion and political argument, and a review of several alternative sites, the Australian Government has announced that the new headquarters of the Antarctic Division, Department of Science, will be constructed at Kingston, 10km south of Hobart. A complex of eight buildings, seven of which will be used by the division, will be built on the six-hectare site at a cost originally estimated at $7 million.

This permanent complex has been specifically designed to meet the administrative, research, engineering, and logistics requirements of the Antarctic Division, which has operated for nearly 30 years in support of the Australian National Antarctic Research Expeditions. The Minister of Science (Senator James Webster) announced in March that plans for design and construction would now be put in hand.

There has been no announcement of when construction will start or whether the construction limit of $7 million stipulated by the Labour Government, which first decided on the transfer of the Antarctic Division from Melbourne in 1974, still applies. This figure was announced in October, 1975, and in March this year the cost was put at $7.3 million. Because of the increase in building costs, and the cost of moving about 200 families, the final may be close to $9 million.

Antarctica and Macquarie Island are among 14 "green areas" which the Australian Conservation Foundation wants listed by the United Nations world heritage committee. This committee's aim is to set up a system of collective protection for the "green areas".

"Green Areas" has nothing to do with vegetation. Other areas which the Australian Conservation Foundation intends to promote this month are the Great Barrier Reef and Lord Howe Island.

B.A.S. NEWS

First Winter of New Base at Rothera Point

Eighty men are wintering this year at the British Antarctic Survey's five bases. Thirteen of them are at the new base at Rothera Point, 64km north-east of the old Adelaide Island base, at 67 deg 34min S/68 deg 07min W. The old base was closed on March 1 after 16 years' continuous occupation.

Field work from the northern bases was continued into April, but ceased in the Antarctic Peninsula area when the remaining Twin-Otter aircraft returned to Canada for annual overhaul at the end of February. A field party from Halley Bay which made an inland traverse to establish an unmanned VLF aerial array 120km from the base, returned at the end of March.

Adelaide base was established as a meteorological station on February 3, 1961. For several seasons topographical and geological surveys of the island took priority, but the base soon became the main centre for summer air operations over a wide area, a runway being marked out on the piedmont. After the Stonington Island base was closed at the end of the 1974-75 summer, it was the centre for all field work south of Marguerite Bay.

Summer field parties were regularly ferried to Fossil Bluff (a small base in George VI Sound) and to field sites in Palmer Land and on Alexander Island. In recent years several flights were also made to Halley Bay on the east side of the Weddell Sea, to the Ross Ice Shelf and over the northern part of the Antarctic Peninsula. Fossil Bluff was closed for the 1976 winter and will in future be used during the summer only.

With constant use during successive summers, the airstrip and the route to it from the Adelaide base site gradually deteriorated and, as more crevasses were revealed, became increasingly dangerous. In addition, access to the base site (a rocky promontory) by sea was always difficult; for a number of years small boats carrying men and cargo from ship to shore faced a heavy swell combined with pack ice.

LACK OF ICE

Paradoxically, the comparative lack of sea ice in more recent years made the situation worse, as the full force of the swell was then felt and at times made landing almost impossible. It was therefore necessary to find an alternative site and Rothera Point was selected. This is a flat area of rock and scree, bordering very extensive piedmont ice.

The new runway, which is 5km inland at a height of 280m, was brought into use for the 1975-76 summer by a party camping in the area, and a small hut built at Rothera Point later in the season was occupied by four men during the 1976 winter. In the 1976-77 summer, a small hut and all moveable equipment and stores were moved across from Adelaide, and extensive new living quarters and a generator shed were constructed with the help of summer visitors. The foundations had been prepared in advance, using 250 tons of cement.

There are now 13 men at the base including several builders who are completing the interior work. The only scientists wintering there are a geophysicist and a meteorologist. The geology and terrestrial geophysics and airborne glaciology and geophysics programmes are now carried out by summer parties.

The main living complex has two storeys, the ground floor providing bunkrooms, laboratories, wash-rooms, and services, and the upper floor the kitchen, lounge/dining room and radio room. A second building houses the generators, air-unit workshop and garage. The original hut which provided temporary living accommodation for 15 men is now used as a store.

PLATEAU TRIP

Preparations are being made at Halley Bay to resume work in the Shackleton Range in the 1977-78 season.

Last season a field party of six left the base at the end of January to establish an unmanned VLF aerial array 120km inland on the Polar Plateau. It returned at the end of March.

The route to the plateau lies across the broken ice of the "Hinge Zone", the junction between the grounded ice and floating ice shelf, and although this had been reconnoitred earlier it was still difficult. Bad weather also hampered travel and work. Unfortunately, the windmill which provides power for the VLF station ceased to function in April and will now be out of action until next summer.

The R.R.S. Bransfield arrived off Adelaide Island at the beginning of February and remained in the Marguerite Bay area for about a month. During this time cargo was delivered to Rothera, stores and equipment transferred from Adelaide and assistance given with the construction of the new Rothera base.

Professor D.D. Hawkes, of the University of Aston, Birmingham, and his assistant were taken to several localities as part of an investigation into metalliferous mineralisation on the west coast of the Antarctic Peninsula. A rendezvous was held with the R.R.S. John Biscoe at Horseshoe Island to transfer fresh water and cargo and with H.M.S. Endurance to transfer staff, and a depot laid on Horseshoe Island for future field work.

BAD WEATHER

The Bransfield also called at the Argentine San Martin Station in the Debenham Islands, and an Argentine party from the icebreaker General San Martin visited Rothera. All these activities were hampered by bad weather, sea ice and the inevitable heavy swell.

Before she left the area the Bransfield carried out a series of soundings at the entrance to George VI Sound, investigating the continuation of the trench, and found a number of uncharted rocks. Then she sailed north, picked up two ionospheric ists from the old Prospect Point base on the Graham Coast, where they had manned Doppler equipment since mid-February, and returned them to the Argentine Islands.

After a call the United States Palmer Station, the Damoy Point air facility was closed for the winter, and the Bransfield then returned to South Georgia. Field parties were picked up from a number of localities, including Bird Island, and taken to King Edward Point. The research vessel Hero, which was working in the area, also transported a B.A.S. party. The Bransfield then sailed for home by way of Montevideo and arrived in Southampton on May 12.

Meanwhile, the R.R.S. John Biscoe, had preceded the Bransfield to the Antarctic Peninsula bases, including Adelaide and Rothera. She then returned to South Georgia to assist the field parties, going south again to rendezvous with the Bransfield in Marguerite Bay. Then she sailed for home by way of the Falkland Islands and arrived at Southampton on April 6.

MAJOR TASK

One of the major tasks undertaken by the Bransfield was the erection of a cross and plaque at Cape Rasmussen on the Antarctic Peninsula near the Argentine Islands, in memory of the three men who lost their lives on Mount Peary last September. A short service held there on February 9 was attended by their companions from the base and men from the Bransfield, including some senior members of the Survey.

A B.A.S. ionosphericist spent some time at the Argentine Almirante Brown Station, operating equipment for an International Magnetosphere Study experiment. An Argentine scientist made a reciprocal visit to the B.A.S. Argentine Islands base. He was joined briefly by other Argentine visitors from the icebreaker, General San Martin, which earlier had called at Halley Bay on her way to relieve General Belgrano Station.

ELEPHANT ISLAND

Several first ascents of peaks in the Elephant Island group were made by members of the Joint Services Expedition, 1976-77, which was picked up by H.M.S. Endurance, the Royal Navy's ice patrol ship in mid-March. One peak — the summit of Aspland Island — was provisionally named Mount Jubilee in honour of the Queen.

With the exception of the western end of Gibbs Island, where a party was thwarted by very unstable ice and snow slopes the islands were explored in detail by the expedition, which was led by Commander Chris Furse, R.N. Altimeter and levelling checks of the peaks climbed showed some heights to be nearly 150m greater than those given on the existing maps.

All parties had been re-united on Elephant Island in mid-February, as planned, but one man who had minor head injuries was temporarily detained on board the Endurance. After belated Christmas celebrations, the eastern end of the island was explored.

Parties then moved westwards to cover the northern, southern and western areas, surveying and studying the mosses and birds en route. An attempt to canoe along the north coast failed: the eastern part proved impassable and further west the two canoes were wrecked by heavy surf.

The parties then gathered at a refuge hut on the south-east coast, which was established by the 1970-71 Joint Services Expedition. They were picked up by the Endurance on March 13.

Anniversary Stamp Lickers

To mark the 20th anniversary of the establishment of Scott Base on January 20, 1957, the New Zealand Post Office issued a special pictorial date stamp with an outline map of Antarctica. One result of the issue was that the base postmaster and his two assistants had to do the driest job on the world's driest continent — licking stamps. Humidity levels in Antarctica fall below those in the Sahara.

On the anniversary day the postmaster, Ian Johnstone, of Taihape, and his two clerks, Peter Carrington, of Levin, and Tam Leota, of Wellington, worked long hours to frank about 6000 letters with the special date stamp. Most of the philatelic mail was from New Zealand, and some of the remainder came from the United States, West Germany, and Switzerland.

Sales of Ross Dependency stamps issued by the New Zealand Post Office were phenomenal in January. Four hundred sets (2400 stamps) were sold in less than a week. The second set of definitive stamps was issued on January 18, 1972, to mark the 60th anniversary of Scott's arrival at the South Pole.

SOVIET NEWS

Mikhail Somov Caught in Ice for 57 Days

More than 250 members of the 22nd Soviet Antarctic Expedition, which was one of the largest for many seasons last summer, are now wintering at the six permanent stations — Molodezhnaya, Mirny, Vostok, Novolazarevskaya, Bellingshausen, and Leningradskaya. If the expedition's flagship had not broken free from the ice off Oates Land, some of the Mikhail Somov's crew might have wintered in Antarctica.

One of seven ships which carried relief parties and supplies for the expedition, the Mikhail Somov was caught in the ice for 57 days. Approaching Leningradskaya, the coastal station in Oates Land on February 2, she ran into heavy weather, was driven shorewards by a gale, and was caught fast in the ice.

After repeated attempts to break out the Mikhail Somov managed to move only 3km by February 7. Non-essential members of the crew were taken off by helicopter to the supply ship Penzhina, waiting in the open sea.

Explosives were flown to the Mikhail Somov so the remaining crew could try to free her by blasting. Information on the state of the ice was obtained from earth satellites, but it was not until March 25 that cracks in the ice were made large enough for the ship to slew about and break free.

WINTER PARTIES

A veteran polar scientist, L.I. Dubrovin, is in charge of the 251 men of the wintering parties. There are 102 at the main Soviet station, Molodezhnaya, 74 at Mirny, 21 and one American exchange scientist at Vostok, 26 at Novolazarevskaya, 15 at Bellingshausen, and 13 at Leningradskaya.

In addition to the Mikhail Somov and the Penzhina, the Soviet Union used five ships in Antarctic operations last season. The Penzhina and the Kapitan Gotskiy reopened the summer station Drushnaya, on the Filchner Ice Shelf, and the Professor Zubov took part in the international Polex-South programme. Other ships engaged were the Bashkiriya, the Estoniya, and the Malinovsky.

Next season scientists from the Soviet Union, the United States, Poland, and New Zealand will conduct joint marine biological research in Antarctic waters aboard the Soviet Institute of Oceanology research ship, Dimitriy Mendeleyev. The aim will be to establish fish resources and prospects for rational harvesting.

Last season Soviet scientists made the first of several geomagnetic traverses as part of the International Magnetic Study (I.M.S.) 1976-79. The traverse was planned from Pionerskaya, 400km from Mirny towards Dome C in Wilkes Land ("Antarctic", June, 1976. Page 326).

Three improved traverse vehicles, designed to operate in temperatures of minus 70deg to minus 80deg over distances up to 500km, are reported to have been used for this traverse. They are improved versions of the 35-tonne Kharkovchankas, three of which were used by the first Soviet party to reach the South Pole by way of Mirny, Komsomolskaya, and Vostok, in 1959.

Poland's New Research Station

Poland, the first country to join the 12 signatories of the Antarctic Treaty, now has a permanent Antarctic research station. It was established last season in Admiralty Bay, King George Island, and has been called Arctowski after Professor Henryk Arctowski, one of two Polish scientists with the Belgica expedition of 1897-99. Nineteen men are wintering at the station.

Last summer the research vessel Professor Siedlecki, of the Polish Sea Fisheries Institute at Gdynia, was sent to the Antarctic for the second time to continue complex oceanographic studies, particularly the exploration of krill resources. At the same time a scientific expedition of two vessels was sent to establish the permanent station.

Originally it was believed that the crews and scientists aboard the Professor Siedlecki and her attendant trawlers would remain in the Antarctic for the winter ("Antarctic", March, 1977. Page 32). But the new station was used as a base for the oceanographic expedition until it returned to Poland at the end of the summer season.

Poland's association with Antarctic research began in the 1958-59 season when the Soviet Union handed over Oasis Station, a sub-station near the western end of Knox Coast 360km from Mirny, and near Lake Figurnoye in the ice-free Bunger Hills. This station was operated from October, 1956, by the Soviet Union and during the International Geophysical Year (1957-58).

After Oasis Station was handed over to Poland it was renamed Dobrowolski after the other Polish scientist with the Belgica expedition. Dobrowolski Station, which had accommodation for nine men, was occupied for two weeks by the Poles in January, 1959, but no winter party remained there.

Because of financial restrictions the station was not occupied by the Poles in the 1959-60 season. Then it was mothballed until January, 1966, when a Soviet party from Mirny called there to inspect it at the request of the Polish Academy of Sciences. Then it was closed permanently.

Members of last season's Australian National Antarctic Research Expeditions called at Dobrowolski Station early in March in the Nella Dan. They found the station in excellent condition, considering its age and lack of maintenance.

Names Placed on Map

Once upon a time the United States Board on Geographic Names vetoed the naming of Antarctic features by explorers for their wives. Marie Byrd Land was accepted, but officially some peaks there like Mounts Ruth Siple, Ann Shirley, Josephine Petras, and Mabelle Sidley, appear on the map without the first name, although Mounts Grace McKinley and Helen Washington were accepted.

But the board has had a change of heart since 1940. Last year it named a peak in South Victoria Land in honour of a New Zealand woman — Miss Margaret Lanyon, of Christchurch. This rare gesture was in in recognition of Miss Lanyon's administrative work in the last 15 years for the United States National Science Foundation, and latterly for Holmes and Narver, contractors to the foundation.

Italian Expedition in Victoria Land

Two areas of South Victoria Land were surveyed by an Italian expedition last season. With New Zealand support the expedition was in the field from November 26 to December 30, and worked in the Royal Society Range and the Wright Valley. It was the third expedition organised by the Italian National Council for Research (C.N.R.) to work on the continent since 1968.

Two previous expeditions were organised by Italian scientific and government organisations to take part in the international scientific programmes which have been conducted since the International Geophysical Year (1957-58). The first, a scientific and mountaineering expedition, spent three months in Antarctica in the 1968-69 season. It was led by the explorer and mountaineer, Carlo Mauri, and with him were Drs Carlo Stocchino and Marcello Manzoni, and two mountaineers, Ignazio Piussi and Alessio Ollier.

This expedition did geological research in the Wright Valley (Olympus and Asgaard Ranges) and in the Skelton Neve (Boomerang Range). On the voyage south from New Zealand it also made oceanographic and meteorological observations, and carried out biological studies on Campbell Island.

In addition to the scientific research the expedition carried out an intensive programme of exploration and mountaineering. Climbs were made in the Boomerang, Olympus, and Asgaard Ranges.

GEOLOGICAL WORK

A second expedition financed by the C.N.R. went south in the 1973-74 season. It was led by Professor Alde Segre, and with him were Drs Stocchino and Manzoni and two mountaineers Ignazio Piussi and Clemente Maffei.

With New Zealand scientific and logistic support this expedition did geological, morphological, and palaeomagnetic research in the Taylor Valley, and on the Blue Glacier. Meteorological research in the area, and in the Miers Valley, included a study of vertical profiles of the air temperature, and radiometric profiles, working from a United States Navy helicopter.

Italy's third expedition was organised with the cooperation of New Zealand scientific and government organisations, and financed again by the C.N.R. It was led by Dr Stocchino, who is chief researcher of the Italian Institute for Atmospheric Physics. This was his fourth visit to the McMurdo Sound area; he visited Antarctica in December, 1972, as the guest of the Antarctic Division, New Zealand Department of Scientific and Industrial Research.

Captain Enrico Rossi, a staff officer in the Italian Navy was the expedition's meteorologist. The other members were Ivo di Menno, an electronics technician from the Institute for Atmospheric Physics, and the noted mountaineer and alpine guide, Walter Bonatti, who acted as topographer.

DRY VALLEYS

This expedition's main purpose was to carry out research into the micro-climate of both non-frozen and frozen land. Its programme was a continuation of research on the same subject done by the two previous expeditions.

Research work covered the field of the energetic exchanges. It was part of the international programme for future studies of the inter-action of air masses and the polar calotte, and heat exchanges.

This research concentrated on the study of the energetic exchanges at the interfaces, air-ice and air-ground, and also on the determination of vertical profiles of temperature, humidity, and the wind. It was based essentially on measurement of the main meteorological oarameters, and employed either normal equipment or apparatus specially made for observing the vertical profiles. Sensors were placed at various levels, and the data was collected and analysed.

In addition to scientific research the expeditions's programme was planned to include the collection of rock samples, lichens, and fossils. This was to meet the needs of other scientists unable to participate in the expedition. Provision was also made for climbing mountains and exploration.

FIRST PHASE

In the first phase between November 26 and December 11 the expedition established a camp in the Emmanuel Glacier area at a height of 3900m in a region completely surrounded by the highest peaks of the Royal Society Range and the Johns Hopkins Ridge. Meteorological measurements and geological observations were made, and many rock samples were taken at different heights, and on the summits of five mountains.

These five peaks were climbed for the first time by Walter Bonatti and Gary Ball, an Antarctic Division field assistant, and new heights were established for several. The three named peaks were Mount Lister (4100m, formerly 4025m), Mount Rucker (4100m, formerly 3816m), and Mount Hooker (4050m).

Messrs Bonatti and Ball also climbed a mountain (3900m, formerly 3650m) between Mount Hooker and Salient Peak, and the two summits of a 3700m mountain of the Johns Hopkins Ridge in front of Mount Lister. A full photographic relief on different triangulations was compiled for the whole area.

Two camps were established in the Wright Valley — near Lake Vanda and near the Onyx River — between December 11 and 26. Trips were made to the upper Wright Glacier and the lower Wright Glacier, to collect samples, and make photographic reliefs.

Because of its complex morphology, the Wright Valley is particularly suitable for micro-climatic studies, and for the study of heat balance at the air-ground interface. The favourable surrounding conditions of the valley facilitated the collection of abundant data on temperature, humidity, wind, and sun radiation. All were collected continuously.

This data will enable a detailed analysis to be made of the air structure in its first strata nearer the ground. It will also contribute to the provision of better information on the micro-climate of one of the most important dry valleys.

Southerly Ski Club

Since 1961 448 New Zealanders have qualified for membership of the world's most southerly ski club. The Scott Base Ski Club is also one of the most exclusive clubs in the world — prospective members have to travel to Antarctica to join it.

Situated about 4km north-east of Scott Base, the ski run has plenty of the dry powder snow that is valued by skiers in other parts of the world. It has a small chalet and a rope tow, and a downhill run of nearly 125m.

It is easy to recognise the club's coveted badge. On a navy blue background are the words: Scott Base Ski Club, Antarctica. The skier on a white background is a perky Adelie penguin with red skis and ski sticks, and a red scarf.

Chile Plans Another Base

Chile plans to establish another base in Antarctic — a facility to serve as an air and sea terminal and a scientific research station. The announcement coincided with an official visit to Antarctica in January — February by the Chilean President, General Augusto Pinochet.

There are two main Chilean bases in the South Shetlands — Capitan Arture Prat on Greenwich Island and Presidente Frei on King George Island. The third main base is General Bernardo O'Higgins on the Trinity Peninsula, an area known to the Chileans as O'Higgins Land.

Chile's new base will be further south, and closer to the South Pole than the others. It will be located in the Marguerite Bay area between Adelaide Island and the Antarctic Peninsula

General Pinochet, accompanied by a large party of officials and their wives, spent 10 days in Chilean Antarctic territory aboard the Piloto Pardo, and was the third Chilean leader to visit Antarctica since 1940. He visited a subbase, Yelcho, on Doumer Island, 27km from the United States Palmer Station on Anvers Island, and watched divers at work.

There has been a long-standing controversy over territorial claims between Chile and Argentina, and General Pinochet's visit drew critical comment from Argentinian newspapers. A Buenos Aires newspaper, "La Nacion", called the visit "an act of territorial claim staking".

About one-half of Chile's claim to 1F million square kilometres of Antarctica — between Longitudes 53deg and 90deg west of Greenwich — lies within the area claimed by Argentina. The Argentine claim between Longitudes 25deg and 74deg is wholly within British Antarctic territory.

Chile's interest in the mineral and marine resources of the area claimed is reflected in reports of scientific research last year. Of five papers published by the Chilean Antarctic Institute one dealt with minerals, and two with krill.

A geological mapping reconnaissance was made of the Gerlache Strait region between 64deg and 65deg S, and areas of future economic interest were defined. Four areas showed evidence of ore deposits: Vetiform copper; polymetallic copper, lead, and zinc; porphyry copper and magmatic iron.

Two scientists from the department of oceanography, University of Chile, recorded for the first time the presence of Antarctic krill outside the Antarctic Convergence. Young krill were encountered in the fjord region of south Chile at approximately 50deg S. They are believed to be expatriates from an Antarctic population which reached this northermost location through ontogentic migration and circulation of water masses.

Another paper by the same scientists provided a bilingual key for Antarctic Ocean crustacea and zooplankton (Antarctic and sub-Antarctic). The report included a generalised diagram of the latitudinal distribution as related to the oceanographic barriers of the Southern Ocean, which is particularly relevant to the Pacific sector.

More Research into Krill Resources

Britain and the United States plan to increase their research into Antarctic marine resources, particularly krill, next season. The British Antarctic Survey will begin more intensive research into krill and fish, and the United States will begin its first intensive study of krill at a special laboratory on Anvers Island off the Antarctic Peninsula.

For several years the Soviet Union and Japan have exploited the stocks of krill in Antarctic waters. The Soviet Union began harvesting krill in the mid-1960's and caught 20,000 tonnes in 1975. It has marketed several commercial products made with krill. Japanese trawlers have made exploratory voyages, and krill has been used to supply protein for humans and animals, but not on a commercial scale.

Now nations interested in the mineral resources of the Antarctic have realised that any future exploitation depends on significant advances in technology, and krill and fish can be obtained more easily at present. That is why there has been a sudden increase in marine research activities in southern waters.

Last season seven nations were engaged in krill research or exploitation. West Germany sent two ships south on a second research expedition, and Poland sent a research ship and trawlers to continue the work done in 1975-76. A Norwegian scientific expedition which worked mainly on the continent last season also carried out research on krill in the Weddell.

CHILEAN RESEARCH

Chile has been involved in krill research in recent years. Its studies of the nutritional value of the tiny crustacean have reached the stage where the Chilean Institute of Fishing Promotion is seeking a private company to market krill products internationally.

Last month the institute began a six-month campaign to test Chileans' reaction to krill products. Pre-cooked frozen breaded krill sticks were placed on sale in Santigo supermarkets. A box of krill sticks weighing slightly more than 226 grammes sold for 80 cents.

Chilean food technologists, like those of other nations, have experimented with krill in several ways to make it more palatable. They have produced krill soup, pudding, pate, salami, and other items.

All the countries engaged in krill research so far have been signatories of the Antarctic Treaty or have acceded to it. A newcomer entered the field last season — Taiwan. A 711-tonne deep-sea trawler, the Haikung, from the Taiwan Fisheries Research Institute, spent six weeks in Antarctic waters to study the possibility of large-scale harvesting of krill.

BRITISH PROJECT

Britain's major krill research programme will be conducted from South Georgia in the Scotia Sea. Dr R.M. Laws, director of the British Antarctic Survey, has been reported in the "Financial Times" (April 13, 1977) as saying that it is now abundantly clear that the Antarctic Peninsula region is the key area for Antarctic science. It is also considered to be the area with the greatest economic potential, and the best way for Britain to retain a stake in its

resources is to maintain a substantial scientific programme.

For various reasons Dr Laws considers that it is better to consider more easily attainable riches in the form of krill and fish rather than minerals, oil, and natural gas. This view is reinforced by the results of the research carried out by the West German research trawler Walther Herwig and the chartered factory trawler Weser in the 1975-76 season. A B.A.S. scientist, Dr Inigo Everson, who worked aboard the Walther Herwig, has described the results as most encouraging.

In the 1975-76 season the West German expedition spent eight months in Antarctic waters, working in the Scotia Sea between South Georgia and the South Orkney Islands, the Wendell Sea, and the waters further eastward between South Georgia and South Africa. More than 200 hauls were made for krill, and there was one catch of 260 tonnes in one hour.

U.S. PROGRAMME

America's krill research programme, financed by a grant from the National Science Foundation, will concentrate on the objectives of BIOMASS (Biological Investigations of Marine Antarctic Systems and Stocks). One aspect of the BIOMASS programme, which has been drafted by the Scientific Committee for Antarctic Research (SCAR) is to find out how far man can go in harvesting krill without damaging the delicate marine ecosystem.

Dr Mary Alice McWhinnie, biology professor at De Paul University, Chicago, who will head the new programme, will start her work in November, using the special laboratory which has been built at Palmer Station. Her main goal will be to learn more about the krill's life, including its reproduction cycle, the number of spawning years it has, how much it eats, and the rate at which it grows at different levels.

Dr McWhinnie is one of the few authorities on krill, which she has studied for several years. She has suggested that there should be an international convention to set limits to the amount of krill that may be harvested legally.

A veteran polar scientist, Dr McWhinnie was one of the first two women scientists to winter in Antarctica. She spent the winter of 1974 at McMurdo Station studying krill.

South Africa's New Ship

A new survey and supply ship, strengthened for navigation in ice, will carry South African expeditions to Antarctic and sub-Antarctic stations next year. The 1400-tonne RSA II, which is being built in Japan for the South African Department of Transport, will replace the RSA, which made its first voyage south in 1962 with members of the third South African National Antarctic Expedition.

RSA II, which is 109.2m long, and can carry 3090 tonnes of cargo, has been designed to transport expedition scientists and support staff, and make research voyages in the South Atlantic and the Indian Ocean. She will have provision for 104 passengers and a crew of 40, and will have space for 1500 tonnes of general cargo and 400 tonnes of oil.

Special equipment will enable the RSA II to discharge unit leads of 25 to 30 tonnes at Polarsirkelbukta off the Fimbul Ice Shelf where Sanae Station is established in Queen Maud Land, and she will carry two helicopters in a hangar aft. There will be 10 laboratories aboard to enable scientists to make oceanographic surveys, and conduct geophysical, meteorological, ionosphere, aurora, and cosmic ray research programmes.

SUB-ANTARCTIC

Expedition to Snares Islands

By
Donald S. Horning

Visits to the almost inaccessible Western Chain (a string of islets 7km south-south-west of the main islands), scuba diving, wingless stoneflies found in abundance in fresh-water streams, and the sighting of a Buller's mollymawk banded in 1948 were some of the highlights of the four-month research programme of the eighth University of Canterbury expedition of the Snares Islands, 104km south-west of Stewart Island. There were five of us in the party that arrived at the Snares aboard H.M.N.Z.S. Taranaki on November 9, 1976: Mr John Early, Mr Graham Fenwick, Mr Paul Sagar, Miss Joy Woods and myself.

Within days of opening the station and just as our research programmes were under way, the first of several visitors arrived. The research vessel W.J. Scott called during the early morning of November 21 to deliver mail and supplies. Our party was taken to Rima Islet, Western Chain, and left for the day while the ship fished off the north and east coasts of the Snares.

This was an unequalled opportunity to spend an entire day at these remote, storm-swept islets. At the Snares, Salvin's mollymawks and fulmar prions nest only at the Western Chain. A great amount of work was accomplished during our brief visit including observations of these and other birds, collecting insects, and taking marine algae and associated invertebrates.

In our rubber dinghy, Mr Fenwick and I motored around all five islets for the first time, noting vegetation and bird life. I made the first recorded landing on Wha Islet after two splashes into the sea from slippery kelp and rocks. In the evening, the W.J. Scott returned us to Main Island and then steamed to Bluff with an injured member of the crew.

Our next visitor was most surprising indeed. Mr Early spotted a racing pigeon beside the lower hut on December 10. It was caught and its metal leg band indicated that it may have been banded in Palmerston North. "Fred" stayed with us for more than three weeks before flying off toward Stewart Island one evening. Several unrecorded and rare bird species to the Snares Islands added interest for our ornithologist, Mr Sagar.

Dr Horning, a visiting research associate in the zoology department of the University of Canterbury, returned to the United States in April after seven years in New Zealand. In that time he has made four expeditions to the Snares Islands, has worked with the university's Antarctic research unit at Cape Bird, Ross Island.

Three fishing vessels from Bluff, the Enterprise, Sapphire, and Trade Wind, spent five days at Snares during December, exploring for crayfish. Two fo the vessels returned in late January for further explorations. The research vessel James Cook arrived on January 22, left two visitors for the night and returned

for them the next evening. Mr Early also left the Snares then to attend the teachers' college in Christchurch.

The weather was abnormally unsettled for most of the expedition. Overcast skies, rain (it seemed as though it fell every day), and cold temperatures prevailed. This hampered some of our work but the marine biology programme was a success despite the rougher than usual sea conditions.

DEEP DIVES

Mr Fenwick and I made more than 20 dives, exploring the near vertical rock walls covered with seaweeds. We found and swam through a long underwater tunnel from Ho Ho Bay to Boat Harbour. A peculiar small fish, adapted for deep water or cave dwelling habitats, was found in crevices along the tunnel walls.

One deep dive to 50m produced an insight to the communities living on broken shell, sandy bottoms — a habitat seen only at deeper depths at Snares. Hermit crabs and other interesting new invertebrates were in abundance. During these dives we collected new records of fish, invertebrates and algae, and took notes for several papers on the animals and the ecology of the subtidal zone.

Miss Wood studied the water chemisty of seven small freshwater streams. She found that the water was very acid, especially at the source of each stream. Amongst the small animals in these streams was a new species of stonefly. The habitat of this most unusual insect for a small island was studied in some depth.

Miss Woods made another interesting find — a microscopic animal that may be the same species that she studied at Ross Island for two seasons. It is a rotifer, philodina gregaria, and it has not been recorded outside the Ross Sea area.

Mr Sagar was very busy travelling from one bird colony to another around the islands. He studied the breeding biology of a colony of Cape pigeons on the cliffs of the North Promontory. The Snares are the northernmost breeding for this bird, which normally nests in much colder areas. Antarctic tern nesting activities and interactions between terns, gulls and skuas took much of his time. His spare moments were used to record newly-arrived species of birds blown in from the mainland during northerly storms and to maintain a log of bird activities.

The weather hampered some of the insect projects. It delayed the flowering of some plants by more than three weeks and the dominant tree, a tree daisy, did not flower at all. Several species of flies normally seen during the summer months were almost non-existent. As a result, the planned study of parasitic wasps associated with some of the flies was restricted.

But Mr Early made good use of his time by studying the invertebrates of the unique sinkhole on the west side of Main Island. He also found a large, handsome weevil, previously unrecorded at Snares, on Broughton Island.

Station maintenance required a share of our time. Track clearing replacing the roof and outer walls of the upper hut and constructing a new large fuel and water tank stand were necessary tasks. A most important job was to clean up the station area and return obsolete equipment from previous expeditions to New Zealand.

The fishing vessel Sapphire returned to pick up our party on the morning of March 3. We steamed up the east coast of Stewart Island and arrived in Bluff in the early morning of March 4. Thus ending one of the most productive and interesting Snares expeditions to date.

The Snares Islands are one of the least non-disturbed groups of Islands remaining in the world. Thus they provide very special circumstances for biological studies. Our research programme was planned to take advantage of these features, and carefully designed to minimise our influence on the ecosystem of the islands.

George Dufek's Support of Antarctic Research

Rear-Admiral George J. Dufek, who died in Washington on February 10 at the age of 74, commanded the United States Naval Support Force, Antarctica, from 1955 to 1959. In 1956 he was the first American to set foot at the South Pole since the days of Amundsen and Scott, but he made a more lasting contribution to the modern age of Antarctic exploration and scientific research.

As commander of Task Force 43 in the United States Navy's Operation Deepfreeze Dufek was responsible for the establishment and operation of seven bases in Antarctica as part of the United States contribution to the scientific efforts of 40 nations in the International Geophysical Year (1957-58). His direction of the building of the "Seven Cities of Antarctica" was describes by Dr Laurence M. Gould, an Antarctic veteran, and director of the United States I.G.Y. Antarctic programme, as the "greatest logistic achievement in the history of Antarctic exploration".

Since the days of Captain Cook every naval officer who has commanded an Antarctic expedition has possessed in the highest degree the qualities of leadership, courage, and professional skill. Dufek belonged to that company,and to their qualities added an outstanding capacity for friendship, and 30 years' experience in handling ships, aircraft, and men. He was a modest man, and never accepted that his achievements gave him a high place in the annals of Antarctic exploration by naval officers. "You might say I push ships and planes around, but I am not an explorer", he said once.

POLAR VETERAN

When Dufek was appointed to command Task Force 43 he was a veteran of two Arctic and two Antarctic expeditions. He graduated from the United States Naval Academy in 1925 and in his 30 years of active service commanded aircraft carriers, submarines, destroyers, and naval air stations. One of the few officers qualified to serve in command in the air, on the sea, and in the waters beneath, he was the subject of a special Act of Congress passed to authorise his promotion from captain to rear-admiral, and to enable him to retain command of Task Force 43 as he was due to retire when appointed.

Dufek's polar experience began in 1939 when he served as navigator of the U.S.S. Bear, flagship of the United States Antarctic Service expedition of 1939-40, led by Rear-Admiral Richard E. Byrd. In the Second World War he assisted in planning the invasions of Sicily, Salerno, and southern France, and commanded a destroyer group in the North Atlantic which sank the last German submarine lost in the war.

In 1946 Dufek was appointed chief staff officer to Rear-Admiral Richard H. Cruzen's United States Navy and Coast Guard task force. This force was organised to establish weather stations in the Arctic. While in the Arctic he was directed to assist in the planning of Operation Highjump, the largest expedition ever sent to the Antarctic in 1946-47.

Thirteen ships and 4700 men took part in Operation Highjump under the command of Rear-Admiral Byrd. The ships and aircraft were organised as Task Force 68 under the command of Rear-Admiral Cruzen. Dufek was in command of the Eastern Group. Its main task was

to map the unexplored coastline of the Bellingshausen Sea, the so-called, Phantom Coast, from the air. On one flight three men were killed when a flying-boat crashed on the Thurston Peninsula. Dufek directed the rescue of the six survivors who spent nearly 13 days on the ice-cap.

After his return from the Antarctic Dufek led Task Force 80 to the Arctic in 1948 to re-supply existing weather stations and establish others in the Lancaster Sound area. On the return voyage the icebreakers Edisto and Eastwind were the first two vessels to reach the Atlantic Ocean from Lancaster Sound by way of the Gulf of Boothia, and Fury and Hecla Straits.

In 1954 Dufek was called to Washington to begin planning for Operation Deepfreeze, the most extensive polar expedition in history. His first Antarctic commander, Rear-Admiral Byrd, was in charge of United States Antarctic programmes, a post Dufek assumed when Byrd died early in 1957. Task Force 43 had to have five scientific stations ready for occupation no later than July 1, 1957.

FIRST PHASE

Eighteen hundred men in seven ships, an air squadron, and a construction battalion took part in the first phase of Operation Deepfreeze. They established Little America V in Kainan Bay, McMurdo Station on Ross Island, and cached fuel and supplies in readiness for building the Amundsen-Scott South Pole Station, and Byrd Station in Marie Byrd Land, in the next season.

For the 1956-57 season Task Force 43 and 3525 men in 12 ships, two air squadrons, segments of three construction battalions, and other specialist units to complete its work for the I.G.Y. By the end of the summer five more stations had been established — Pole Station, Byrd Station, Wilkes Station on the Knox Coast, Ellsworth Station on the Weddell Sea coast, and Hallett Station, the joint United States-New Zealand station at Cape Hallett.

Dufek was the first American to reach the South Pole since Scott and Amundsen. He described his landing there on October 31, 1956, with six other men as a reconnaissance in the line of duty. His purpose was to determine whether ski-equipped aircraft could operate safely at the Pole, and whether a scientific station could be built there. Later he helped other men to reach the Pole — Sir Vivian Fuchs and Sir Edmund Hillary — and the full resources of his command were available to them if ever they were in difficulties.

When Dufek relinquished his Antarctic command and retired for the second time, he became director of the Mariners Museum, Newport News, Virginia. He remained there until his final retirement in 1973, and maintained his interest in Antarctic affairs; there was a place for Antarctica in a museum concerned with ships, sailors, and the sea. His Antarctic experiences were recalled in two books, "Operation Deepfreeze", the story of the first phase, and "Through the Frozen Frontier", an account of Antarctic exploration for younger readers.

MANY FRIENDS

In his five years of command Dufek established a special relationship with New Zealanders because his headquarters were in Christchurch. He became the friend of hundreds of New Zealanders, and in the Antarctic those at Scott Base were his friends and neighbours. Neighbours were there to be helped, and Scott Base, established in 1957, was built with American assistance.

George Dufek led a full, adventurous life before he was selected to support the United States scientific effort in Antarctica. He accepted the command because he wanted to leave something positive and concrete behind him. The international scientific community, and United States scientists in particular, know well the outstanding contribution he made to the success of today's research on the seventh contient.

THE READER WRITES

Sidelights of Antarctic Research

HUT VISITORS

In the name of accuracy I must challenge the claim in "Antarctic" (March, 1977, Page 378) that the party of visitors from the Northwind constituted a record for the number of persons to visit Shackleton's hut at Cape Royds in one day.

On January 4, 1974, I took a party of 93 tourists plus 20 crew members through the hut during a three-day stay by the tourist ship, Lindblad Explorer.

I am also moved to claim several other records for this visit. On January 5, 29 persons led by John Green and myself walked from Cape Royds to Cape Evans and back in six hours, including one hour at Scott's hut on Hut Point. This party had 12 women in it, and I believe they would be the first women to have undertaken the journey.

I also claim this was the largest party to have made the journey, and it must rank among one of the quickest. Representatives probably from Brazil, Argentine, Switzerland, and Sweden were the first citizens from those countries to make the visit.

What troubles me is, that the recent visit by such a large party needs constant supervision. I am alarmed that in the account of the Northwind visit no mention is made of someone answerable to the New Zealand authorities being present to control itchy fingers etc.

Yours, etc.

BADEN NORRIS

/Our report did say that the tourist traffic probably set a record. Mr Norris need not be alarmed; the visit was supervised by one of the staff of the Antarctic Division, D.S.I.R. — Editor./

Few Huskies Leave Antarctic

A rare honour may come to a Scott Base sledge dog, Apolotok. The huskies there never leave the Antarctic, but Apolotok is being considered for a trip to New Zealand — posthumously.

Last month Apolotok was found dead at the dog lines. He is being kept frozen pending a decision whether he should be brought to New Zealand for taxidermy and display. Flights between Christchurch and McMurdo Sound do not resume until the spring, and in the meantime the Antarctic Division, D.S.I.R., will consider whether the dog could be displayed.

A big handsome dog, Apolotok ("The Red One") was six years old in April — middle age for a working husky. The cause of death was unknown, but he had shown signs of being affected by arthritis in the last two seasons.

Of the 24 huskies on the dog lines Apolotok was the biggest, weighing almost 50kg. Apolotok's three sons and two daughters are at Scott Base. One daughter is Megan, who was selected to lead one of the two sledging teams last summer.

ANTARCTIC BOOKSHELF

ICE ON MY PALETTE
by
Maurice Conly. Text by Neville Peat

Whitcoulls Publishers, Christchurch, New Zealand. 64pp, N.Z. price $14.95

Edward Wilson was both artist and poet. His pen and watercolours recorded with sensitivity the beauties and harshness of the Ross Sea area when few had ventured there.

One suspects that his qualities have left their imprint on Maurice Conly as artist and Neville Peat as writer. Both refer to him. Conly acknowledges his adaption of Wilson's techniques. His magnificent "Midnight Solitude" scene (Page 7) could well be a Wilson painting. The effect of Conly's acrylic paint is similar to the stronger watercolours of Wilson as reproduced in his diary of the Terra Nova expedition.

Neville Peat's text, with every sentence refined, has a Wilsonian touch too. Compare Peat's prose (Page 32): "There is only the swish and slap of the sledge runners on the dry grainy snow and the muffled tread of the huskies . . ." to Wilson's verse ("The Barrier Silence"): "The Silence was deep with the breath-like sleep / As our sledge runners slid on the snow. / And the fateful fall of our fur-clad feet / Struck mute like a silent blow . . ."

This book presents 25 of Conly's Antarctic paintings, well supported by his clever charcoal and pencil sketches. It portrays an Antarctic summer in the Ross Sea area, arrival, McMurdo Station, Scott Base, field work, the historic huts, wildlife, the dry valleys and South Pole Station are the principal subjects.

There are some memorable paintings. Shackleton's hut and Mount Erebus (Page 41), Adelie penguin rookery, Cape Royds (Page 47) and Taylor Valley (Page 59) are perhaps the best. These and "Midnight Solitude" have a common factor. They represent the moods of Antarctica as if Man was still a stranger there. Even Shackleton's hut is "very much a part of the tranquility" to use the author's eloquent phrase.

Many of the paintings cover scenes with which the camera, often more versatile than the most versatile Antarctic painter (which Conly must surely be), has in recent years competed.

Aeroplanes, helicopters, ships, motor toboggans, tractors, dogs, and men have been faithfully portrayed by the artist. But there are few photographs which could record as successfully the interior of the brooding Cape Evans hut (Page 45), or as colourfully the activity of the Scott Base workshop (Page 29). For this reason Conly's fine interior painting of the Discovery hut, almost impossible to photograph, would have been a welcome addition.

Peat's prose attains the standard of Graham Billing's "South" (1964) and John McPherson's "Footsteps on a Frozen Continent" (1975). Of particular relevance today is his statement of the political and international situation under the Antarctic Treaty. His conclusions are basically positive: "for Nature is the sovereign power and her silent white servants, snow and ice, continue to preserve Antarctica's primeval character".

The aptly-named introductory essay "Antarctica: a Word Portrait" is an important document in itself; important because it makes the complex simple. It displays thorough research. Like most of Conly's paintings it has an historical aspect. Topical today, the changing scene momentarily stands still, and tomorrow this book will be an important historical and artistic record. *R.G.M.*

"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.

Yearly subscription NZ$4.50, Overseas NZ$5.50, includes postage (air mail postage extra), single copies $1.00. Details of back issues available, may be obtained from the Secretary, New Zealand Antarctic Society (Inc.), P.O. Box 1223, Christchurch, New Zealand. Back issues more than five years old are $1.50. Discount of 10 per cent for 20 or more copies.

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.

New Zealand Secretary

Miss J. Kerr, P.O. Box 1223, Christchurch.

Branch Secretaries

Canterbury: Mrs J. Kerr, P.O. Box 404, Christchurch.
Wellington: Mr G.D. Sylvester, P.O. Box 2110, Wellington.


RAVEN
PRESS