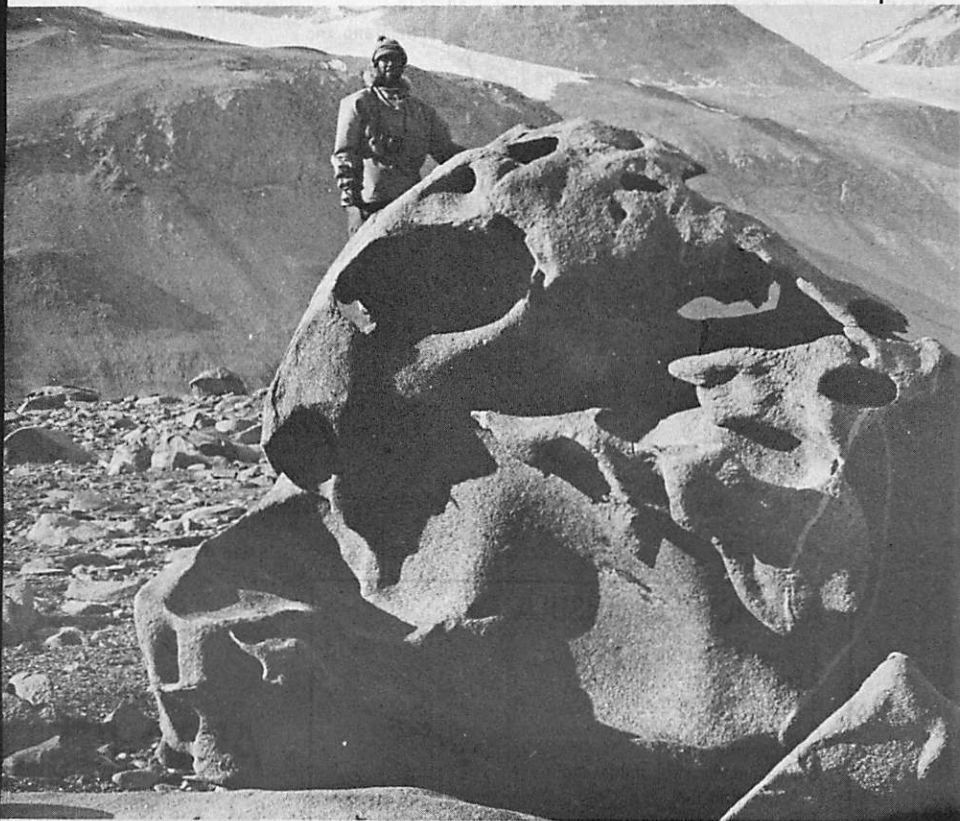


# ANTARCTIC

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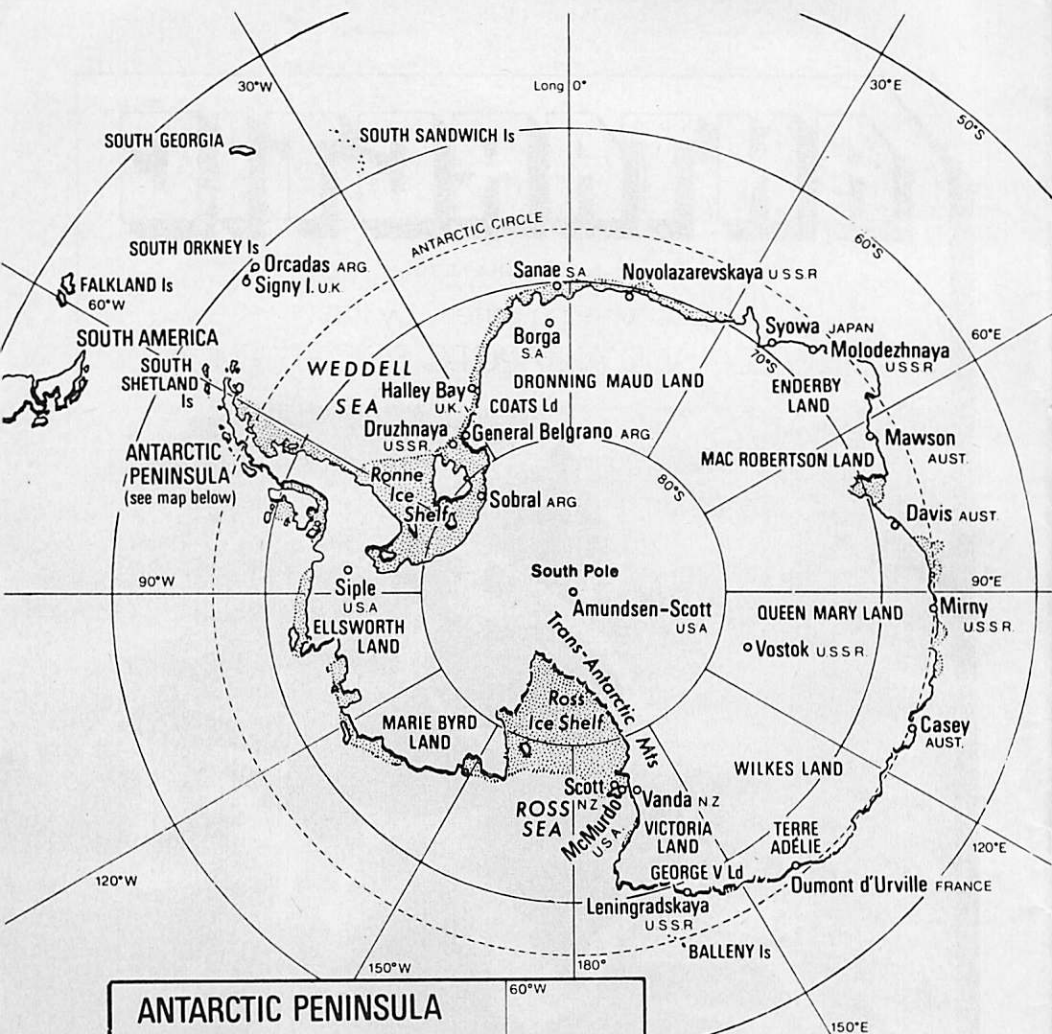
Salt crystallisation and wind have taken more than a million years to shape this Antarctic granite in the style of a Henry Moore sculpture. Behind the rock above Lake Bonney in the Taylor Valley is a New Zealand geochemist, Dr C.H. Hendy.

University of Waikato photo

Vol. 8, No. 7

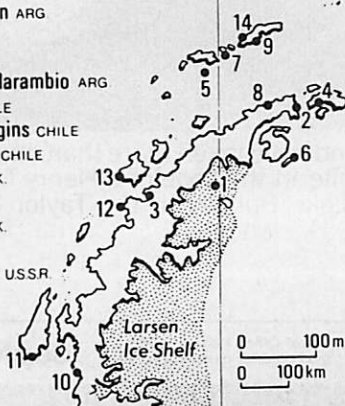
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## ANTARCTIC PENINSULA

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- 11 Adelaide I. UK.
- 12 Argentine Is UK.
- 13 Palmer USA
- 14 Bellingshausen USSR



## ANTARCTICA

0 500 1000 Miles

0 500 1000 Kilometres

### ABBREVIATIONS:

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

# ANTARCTIC

(successor to 'Antarctic News Bulletin')

**Vol. 8, No. 7**

**91st Issue**

**September, 1978**

Editor: J.M. CAFFIN, 35 Chepstow Avenue, Christchurch, 5.  
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# NEW ZEALAND PLANS FOR SEASON

Two international projects — observations on Mt Erebus, one of Antarctica's two known active volcanoes, and studies of the glacial history of the Darwin Mountains area 250km south of Scott Base — are included in New Zealand's Antarctic research programme for 1978-79. New Zealand, French, and American scientists, including one woman, will participate in the Erebus project, and scientists from two universities will co-operate with United States parties in the Darwin Mountains.

Remote projects in the programme will be a geological expedition to Marie Byrd Land, and a study of krill resources by a New Zealand marine biologist who will work with a Polish fisheries research expedition in the waters around the Antarctic Peninsula. Preparations will also be made this season for a second attempt in the 1979-80 summer to drill through the annual sea ice into the seabed sediments of McMurdo Sound, an international project in which New Zealand, United States, and Japanese scientists will take part.

In addition to the major projects on Erebus and in the Darwin Mountains New Zealand will provide support for or take part in other international programmes with the United States, Japan and Australia. Japanese scientists will work with New Zealand support in the Taylor Valley, and at Cape Bird on Ross Island.

## DARWIN GLACIER

New Zealand will contribute a group of six scientists and an Antarctic Division field staff of four to the international project in the Darwin Mountains. In addition two scientists from the Soil Bureau will work from the project's base camp on the Darwin Glacier.

Professor George H. Denton, of the University of Maine, will head the United States programme, and his

group will combine with the New Zealanders from the University of Waikato and Victoria University of Wellington, to undertake geochemistry, geomorphology, and sedimentology in the Darwin Mountains, Brown Hills, Tentacle Ridge, and Byrd Glacier region. Field safety of the whole project which may involve up to 55 people, will be the responsibility of the New Zealand field staff.

Dr G.G.C. Claridge, who initiated a programme of Antarctic soil studies in 1959, and Mr I.B. Campbell, will study nitrate salts in soil formations found on some of the nunataks at the head of the Darwin Glacier. This will assist their hypothesis on the origin and formation of these salts in other Antarctic locations such as the heads of the dry valleys and the Beardmore Glacier.

Scientists from five universities will undertake a number of field research projects, including programmes in biology, vulcanology, glaciology, geology, geochemistry, geomorphology, and psychology. Men, and seven women, from the universities, Antarctic Division, Ministry of Works and Development, Lands and Survey Department, Physics and Engineering Laboratory, Geological Survey, Soil Bureau, Meteorological Service, and Institute of Nuclear Sciences, will work on a wide range of projects. Government field parties' research will cover glaciology, geology, vulcanology, marine biology, and geo-



physical and topographical surveys.

### NEW POWERHOUSE

One feature of this season's programme will be the erection of a new powerhouse at Scott Base — the second stage of the five-year programme for rebuilding the base. A combined Ministry of Works and New Zealand Army construction team will also instal two new generators and mechanical and electrical services.

Established laboratory research programmes in atmospheric physics and earth sciences will continue at Scott Base and Arrival Heights through the year with two significant additions. Ionospheric D-region observation equipment will be installed at Arrival Heights by two scientists from the University of Canterbury physics department. Dr. Philip Kyle, of Ohio State University, will place seismic records at various locations around the base of Mt Erebus, and these will be maintained by Scott Base staff.

Auroral observations will be continued with the all-sky camera, and Professor Charles Wilson, of the Geophysical Institute, University of Alaska, will continue his observations of auroral infrasonic waves at Windless Bight 27km north-east of Scott Base. This is a joint United States-New Zealand experiment started in the 1976-77 season.

### WEATHER RECORDS

From November 1 the meteorological programme at the Amundsen-Scott South Pole Station, which has been carried out by the New Zealand Meteorological Service for three years, will be resumed by the United States Navy. In future the Meteorological Service will update the Scott Base observing programme by making additional radiation measurements, including some data analysis. It will co-operate with United States observers at McMurdo Station to obtain data on the relationships between Antarctic circulation, and changes in atmospheric circulation over New Zealand.

Vanda Station in the Wright Valley

will be operated for the summer only. The normal scientific programme will be continued by a team of four men led by Mr Brian Doughty. In addition the station will provide logistic and communications support for New Zealand research parties working in the dry valleys.

This year a Meteorological Service technician will make a comprehensive set of weather observations at Vanda Station for use in the First GARP Global Experiment (FGGE) planned for January and February next year. GARP is the Global Atmospheric Research Programme, an international programme of atmospheric science, and FGGE is an intensive reconnaissance of the global atmosphere to determine the minimum facilities needed to meet the objectives of GARP research.

### REMOTE PROJECT

One of the most remote field parties in the New Zealand programme will be the members of the Geological Survey's expedition to Marie Byrd Land. They will spend two months in the southern Edsel Ford Ranges of western Marie Byrd Land, which are about 1500km from McMurdo Station, and will be away from Scott Base from early November to early January.

Geological evidence obtained from Marie Byrd Land by United States and New Zealand geologists suggests that the Campbell Plateau south-west of New Zealand may have once been contiguous with the area where the Geological Survey party will work. The geologists will evaluate critically the basement geology of Marie Byrd land in terms of this proposition. They will study the largely Precambrian and Paleozoic geology of the southern Edsel Ford Ranges, and evaluate the rocks as possible source rocks of the late Paleozoic and Mesozoic Torlesse rocks of eastern New Zealand.

New Zealand's expedition, which will coincide with a United States expedition to investigate the metamorphic basement rocks in the northern Edsel Ford Ranges, will be led by Dr Peter Andrews, of the Geological Survey. The

other members of the party are Dr John Bradshaw, of the University of Canterbury geology department, Dr Chris Adams, of the Institute of Nuclear Sciences, and Peter Braddock, an Antarctic Division field assistant-mechanic. Drs Andrews and Bradshaw have twice taken part in geological expeditions to northern Victoria Land, and Peter Braddock was there in the 1974-75 season.

Present plans are for a United States Navy Hercules aircraft to put the expedition with its motor toboggans and sledges in at a site on the Arthur Glacier (77deg 02min S/145 deg W), just south of the Swanson Mountains or at the 1966-67 Marie Byrd Land survey camp at 76deg 58min S/144 deg 02min W. Early in January the party will be flown out from either a snow plateau near the Haines Mountains at 77deg 47min S/146deg W or the original put-in site.

#### POLISH RESEARCH

Furthest from Scott Base this summer will be Roger Waite, a marine biologist, who will be aboard the research vessel Professor Siedlecki, of the Polish Sea Fisheries Institute at Gdynia. He will study aspects of krill biology while the Professor Siedlicki is operating in the waters around the Antarctic Peninsula.

Mr Waite was born in England, and has a B.Sc. degree with honours from the University of Keele, North Staffordshire, but his parents are New Zealanders living in London. On the Polish expedition he will work with a leading authority on krill, Dr Stanislaw Rakusa-Suszczewski, of the Polish Institute of Ecology. Dr Rakusa-Suszczewski made studies of krill when he wintered with the Americans at McMurdo Station in 1974.

#### WORK ON EREBUS

Once again a New Zealand-French-United States expedition will be on Mt Erebus this summer. Scientists of the three nations worked around the crater area of the volcano in the 1974-75 season. One member of this year's expedition will be the French vulcanologist, Dr

Haroun Tazieff, who will make another attempt to obtain samples of volcanic gases emitted from immediately above the surface of the molten lava lake in the inner crater. Dr Tazieff worked with New Zealand parties on the mountain last season, and was there in 1974-75.

This time Dr Tazieff and two other French scientists plan to use a radio-controlled model aircraft to obtain the gas samples from the inner crater of Erebus. The aircraft is one of several developed by the French Meteorological Office for study of the upper atmosphere. It is 2m long, has a two-stroke engine of 1.5 horsepower, and can carry 2.5kg of scientific equipment. When launched by catapult the sonde plane can fly for about an hour, and reach a height of 4000m.

Dr Tazieff has already tested one of the sonde planes above Mt Etna in Sicily. It measured the thermal environment of the volcano, and evaluated vertical changes in temperature above the crater. In addition it took samples from the plume of gas above the volcano so the chemical elements could be determined.

#### N.Z. TEAM

A New Zealand geologist, Dr Philip Kyle, now at Ohio State University, who began his studies of Erebus several years ago with a Victoria University of Wellington expedition, will head the United States component of the project. With him will be a co-worker from Ohio State University, and another American, Kathy Cashman, a Fulbright scholar who is doing a master's degree in volcanics at Victoria University. A New Zealand geochemist, J.R. (Harry) Keys, who was with VUW-21 on Erebus in the 1976-77 season, will work with the Ohio State University team as a field assistant on his fifth visit to Antarctica.

A seismologist from Victoria University, Wellington, Dr Ray Dibble, who was with the 1974-75 expedition, will make further magnetic, seismic, and visual observations around the crater area of Erebus. The other New Zealanders in this season's project will be Colin Monteath, field operations officer,

Antarctic Division, who worked on Erebus in the 1975-76 and 1976-77 seasons. He will be the field leader, and will be assisted by Carl Thompson, field leader of the survival training course at Scott Base.

In past seasons scientists working on Erebus have camped in tents 122m below the summit. This summer the United States National Science Foundation has arranged for a Jamesway hut to be erected near the normal summit camp. A hut will aid in the running of the seismic recorders and other equipment.

### ICE STUDIES

Studies of the properties of Antarctic ice, using physical metallurgy techniques, will be made by three scientists from the Physics and Engineering Laboratory, Department of Scientific and Industrial Research. Messrs W. Robinson, A. Tucker, T. Haskell, and an Antarctic Division field assistant, Annette Richards, will work in the dry valleys, and on the Erebus Ice Tongue on Ross Island.

To determine the electrical charge on dislocation of ice the P.E.L. scientists are working on the physical properties of single crystal ice. In Antarctica they will look at hardness, and in particular the hardness stress-strain curve as these properties give a good measure of plasticity, and therefore a guide to the resistance to flow of glaciers.

In November the P.E.L. team will make measurements of hardness, grain size, and orientation and dislocation density of the ice at Lake Vanda in the Wright Valley. They will also drill out some large single crystals, and will study ice on the Clark, Canada, Commonwealth, and Taylor Glaciers, and on the Erebus Ice Tongue. One scientist (W. Robinson) will return to Antarctica in January and, assisted by Annette Richards, will do an additional week's sampling. During this period a P.E.L. trainee, Stuart Craig, will join the group.

### LAKE LEVELS

Four Ministry of Works hydrologists,

assisted at various times by field assistants from Vanda Station, and Lands and Survey Department surveyors, will continue the monitoring programme in the dry valleys, documenting long and short term climatic variations. They will also study the flow regime of the Onyx River.

Leader of the team is Ian Halstead, who worked in the dry valleys in the 1972-73 season. With him will be Royd Cumming, Andrew Woods, and Lloyd Smith. This season the scope of the programme has been increased to cover a full field season, and enable a five-yearly photo-theodolite survey to be repeated on a number of selected glacier margins. At the same time a large reduction has been made in the number of glacier balance measurements.

Automatic recording of summer water levels on Lake Bonney in the Taylor Valley, and Lake Vanda in the Wright Valley will be carried out. On Lake Vanda ice thickness and ablation measurements will also be made.

To document short-term climatic variations the levels of Lakes Vanda, House, Joyce, Bonney, Henderson, Hoare, and Fryxell, will be measured at the beginning and end of summer. For the long-term variations glacial mass balance measurements will be taken on the Heimdall Glacier. It is also planned to make the five-yearly survey on the 16 dry valley glaciers where sites have already been established.

A seismic survey of the lower Taylor Valley will be carried out by United States and New Zealand scientists. The team from the University of Northern Illinois and the Antarctic Division plans to define the basement topography in the valley, and, if possible, link sedimentary layers between drill sites used in the Dry Valley Drilling Project.

Some New Zealand support will be provided for a Japanese Antarctic Research Expedition party led by Dr Tetsuya Torii, which will carry out geological and geochemical research in the dry valleys, and use Vanda Station.

Dr Torii and his co-worker will also work at Lake Fryxell in the Taylor Valley with scientists from the University of Waikato.

New Zealand will join with the United States again to provide logistic support for their respective programmes. This season R.N.Z.A.F. Hercules aircraft of No. 40 Squadron will make 12 flights between New Zealand and McMurdo Station. For the first time Royal Australia Air Force Hercules aircraft will operate through Christchurch. They will contribute four flights to the U.S.-N.Z. logistic pool.

As in past seasons two R.N.Z.A.F. helicopter crews will be attached to the United States Navy's VXE-6 Squadron and fly on support missions. Air crews and load planners will be provided, and Army cargo handlers will work at Williams Field near McMurdo Station.

Courses in basic snowcraft and survival techniques will be provided as in past seasons for United States air crews, United States Coast Guard icebreaker crews, and American and New Zealand research staff. The courses will be conducted by an Antarctic Division field leader and two field assistants.

---

## Work on historic huts

A secondary school teacher and a building overseer from the New Zealand Antarctic Society will take part in the New Zealand Antarctic research programme this summer as caretakers of the historic huts on Ross Island. They are Mr Clive Patterson, of Lake Tekapo, and Mr John Oliver, of Christchurch, both members of the Canterbury branch of the society.

Messrs Patterson and Oliver will fly south in December. They will spend several weeks on Ross Island, and will continue for the Antarctic Division the restoration and maintenance work at Scott's huts at Cape Evans and Hut Point, and Shackleton's hut at Cape Royds. Caretakers nominated by the society have worked at the huts every season since 1969 with a break in the 1975-76 summer.

Mr Patterson, who is 32, has taught at the Fairlie High School for the last four years, and is a former journalist. He is a graduate of the University of Canterbury where his main subject was geography. As a member of the New Zealand Alpine club he has had 11 years' climbing experience, including winter ascents, in the Mt. Cook region, Fiordland, and the Arthur's Pass area. He has been a member of the Antarctic Society of 12 years.

Mr Oliver, who is 31, was born in New Plymouth. He is a building overseer with the Ministry of Works and Development, and was previously a carpenter. A member of the Antarctic Society for two years, he is on the committee of the Canterbury branch, and has supervised the restoration of the Kinsey Cottage, a 75-year-old building which was once part of the property of Sir Joseph Kinsey, who was the New Zealand representative for Scott and Shackleton on their three expeditions to the Ross Dependency area.

Before he came to Christchurch Mr Oliver did some climbing and tramping in the Mt. Egmont area and other parts of Taranaki. One of his private interests is Antarctic philately.

## Mixed fish dish

Some Antarctic fish are more palatable than others. Americans who sampled ice fish (*Trematomus bernacchi*) at Palmer Station on Anvers Island off the Antarctic Peninsula seem to have mixed feelings about them.

During the winter Casey Jones, the Palmer Station cook, caught two ice fish, and served them a *la meuniere* (fried in butter with a *dash of lemon* juice and oil) to his five colleagues. Peter Harding, who is in charge of the winter team, reports: "They tasted . . . interesting."



## Winter team at Scott Base

For the first time since 1975 the officer in charge of the New Zealand Antarctic research programme for the 1978-79 summer will remain at Scott Base as leader of next year's winter team. And for the first time in 21 years the winter team will include a woman, Ms Thelma Rodgers, of Christchurch.

Nine men have also been selected to winter at Scott Base through 1979 under the leadership of Mr John Presland, a 45-year-old former New Zealand Army officer, of Christchurch. ("Antarctic," June, 1978). Seven are New Zealand-born, and two, like Ms Rodgers, were born in Britain. There is one 22-year-old, and other ages range from 23 to 45.

Ms Rodgers, who is 30, will be the scientific officer at Scott Base next winter. She is a technical officer in the Physics and Engineering Laboratory, Department of Scientific and Industrial Research, and worked at Scott Base in the 1976-77 summer.

Members of the winter team are:

**T.A. Stephenson** (30), Christchurch. Base engineer. He is a maintenance engineer.

**R.N. Geddes** (24), Nelson. Fitter-mechanic. He is a motor mechanic in Nelson.

**C.F. Cunningham** (22), Christchurch. Fitter-electrician. He is an electrician in Christchurch.

**P.G. Jones** (23), Christchurch. Cook. He is a Royal New Zealand Air Force chef at Wigram.

**M.J. Challinor** (45), Auckland. Postmaster. He is a postmaster at Blockhouse Bay, Auckland.

**T.A. (Thelma) Rodgers** (30), Christchurch. Scientific officer. She is a technical officer with the Physics and Engineering Laboratory in Christchurch.

**P.J. Cleary** (25), Christchurch. Field assistant and dog handler. He is a park assistant with the South Westland National Park Board.

**A. Burt** (23), Christchurch. Technician. He is a television technician in Christchurch.

**R.K. Vincent** (27), Greymouth. Technician. He is a technician with the New Zealand Railways.



**THELMA RODGERS**

## Macquarie Island mail drop

Mail, fresh fruit and vegetables, and other items, were delivered by air to the winter party on Macquarie Island in the sub-Antarctic on June 21. This was the first mail the 19 men and one woman on the island had received in five months, and the air drop by a Royal Australian Air Force Orion was of special significance because it was made on Mid-Winter's Day.

An Orion long-range marine reconnaissance aircraft from Edinburgh, South Australia, made the flight to Macquarie Island by way of East Sale, Victoria, in about three hours and a half. The first of such flights was made on September 7 last year, and it is hoped that there will be a mail service to the island twice a year.

Macquarie Island's men and their cook, Ms Enid Borschmann, may receive more air mail this month. The next ship to the island is not expected until November.

## SUMMER FIELD PROJECTS

New Zealand geologists will work in the mountains of western Marie Byrd Land far from Scott Base, and in the Darwin Mountains, this season. Other scientists will work around the craters of Mt Erebus, and on glaciers in Victoria Land. They are members of field parties in the Antarctic research programme for the 1978-79 summer which, including support and construction activities, will call on the services of more than 160 men and women.

Research will be conducted by scientists from five New Zealand universities, and the programme will draw on staff from the Antarctic Division, Ministry of Works and Development, Physics and Engineering Laboratory, Geological Survey, Meteorological Service, Lands and Survey Department, Soil Bureau, Institute of Nuclear Sciences, Post Office, New Zealand Army, and Royal New Zealand Air Force. The programme will also include guest scientists from Australia, France and Japan.

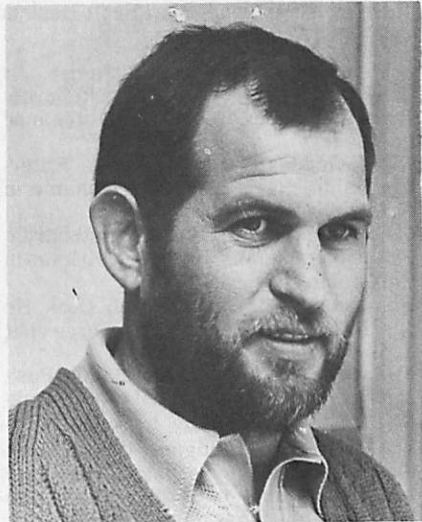
Men and women in the programme will work at or from Scott Base, Cape Bird in the dry valleys of Victoria Land, and in McMurdo Sound. New Zealanders will work with Americans in the Darwin Mountains, and at Scott Base and McMurdo Station. They will also work with French and Americans on Mt. Erebus, and with Japanese on Ross Island and in the dry valleys.

Vanda Station, in the Wright Valley, and 130 km west of Scott Base, is basically a summer station, but winter parties have worked there in 1969, 1970 and 1974. This season it will be operated again for the summer only by a team of four men led by Mr. Brian Doughty, who will spend his second summer in the Antarctic.

A major contribution to the needs of the New Zealand research programme in future seasons will be made this season by the Army. It will send a team south to work on the second stage of the re-building of Scott Base, a project in which the Ministry of Works and Development will also take part. In the 1976-77 season the combined team erected a new science laboratory and

accommodation block; this summer it will erect a new powerhouse, and install new generators, and mechanical and electrical services.

There are seven women in the programme this season, and one will remain at Scott Base in the winter of 1979. She is Thelma Rodgers, of the Physics and Engineering Laboratory, who will be the scientific officer in the winter team. Ms. Rodgers worked at Scott Base in the 1977-78 summer.



**BRIAN DOUGHTY**

Two of the seven women are zoologists. Charlotte Holmes and Jennifer Bassett will take part in studies of the Weddell sea population at White Island, and the food chain dynamics of the ecosystem under the ice. This project

was started in the 1976-77 season by the University of Canterbury's Antarctic biological research unit.

Members of the summer staff at Scott Base are Jane Fournier, who will do general duties, and Karen Williams, who will act as information officer-photographer during the season. Mrs Vivienne Hendy will work with her husband on geochemical studies of Lakes Bonney, Vanda, and Fryxell in the dry valleys, and Annette Richards will be a field assistant with Japanese Antarctic Research Expedition scientists making similar studies in the same area. She will also work in Victoria Land with one of the scientists from the Physics and Engineering Laboratory who will study the properties of Antarctic ice.

#### SCOTT BASE

**J.R. Presland**, Christchurch. Leader.  
**W.K.A. Berry**, Auckland. Deputy-leader. He is 51, and is education officer at the Auckland Museum. Several seasons ago he was an instructor with the United States research programme snowcraft and survival course.  
**R.S. Garrick**, Gore. Maintenance officer-carpenter.  
**G.P. Henderson**, Lower Hutt. Assistant maintenance officer.  
**P.H. Liley**, Havelock North. Assistant maintenance officer.  
**M.A. McLeod**, Darfield. Assistant maintenance officer.  
**W.F. Turnbull**, Rotorua. Storekeeper.  
**M. Sinclair**, Dunedin, Meteorological officer.  
**Jane Fournier**, Nelson. General duties.  
**Karen Williams**, Hawera. Information officer-photographer.  
**P. MacDonald**, Christchurch. Senior Post Office clerk.  
**B. Stirling**, Winton. Post Office clerk.  
**E. Johns**, Timaru. Post Office radio technician.

#### VANDA STATION

**B.L. Doughty**, Wanganui. Leader. He is a 32-year-old livestock officer with the Ministry of Agriculture and Fisheries, and was a maintenance officer-carpenter at Scott Base in the 1975-76 season.

**A. Fraser**, Invercargill. Meteorological officer.

**G.C. Callander**, Hamilton. Technician. He was at Vanda in the 1974-75 season.  
**R.E. Millington**, Wellington. Field assistant.

University projects are outlined elsewhere. Other projects and the participants are:

**Ministry of Works and Development.** Glaciology and hydrology in the dry valley area. I. Halstead (leader), R. Cumming, A. Woods, L. Smith, hydrologists.

**Geological Survey.** Comparative study of geology of southern Edsel Ford Range, western Mari Byrd Land, with southern and western New Zealand. Drs P.B. Andrews (leader), J.D. Bradshaw, C. Adams, geologists, P. Braddock (field assistant-mechanic).

**Meteorological Service.** Observation programmes at Scott Base, and atmospheric circulation data, McMurdo Station. M. Sinclair. Vanda Station observations. A. Fraser.

**Institute of Nuclear Sciences.** Continuation of monitoring by Scott Base staff of carbon 14 content of atmospheric carbon dioxide.

**Physics and Engineering Laboratory.** Continuation of upper atmosphere studies at Scott Base and Arrival Heights. Antarctic ice studies on Clark, Canada, Commonwealth, Taylor Glaciers, Erebus Ice Tongue. W. Robinson, A Tucker, T. Haskell, S. Craig (P.E.L. trainee), Annette Richards, Antarctic Division field assistant.

**Lands and Survey Department.** Two surveyors will work on a variety of projects at Scott Base, Arrival Heights, New Harbour and Granite Harbour, and in the dry valleys. They will support the McMurdo Ice Shelf movement studies. N. Nalder, C. Fink.

**Antarctic Division.** Adelie penguin census at Cape Royds rookery for annual reports to Scientific Committee on Antarctic Research and Antarctic Treaty nations, Continuation of Weddell seal population census in Scott Base to Cape Royds region.

Snowcraft and survival training for United States and New Zealand staff. C.R. Thompson (field leader), A. Brown, J. Graham (field assistants).

Scott Base staff will continue at the base and Arrival Heights the University of Canterbury mechanical engineering department project to determine the effect and degree of atmospheric corrosion on aluminium.

**Antarctic Division, Victoria University of Wellington.** Professor A.J.W. Taylor, professor of clinical psychology, will continue gathering psychometric data from Scott Base winter teams (1978 and 1979).

**International projects.** Dr H. Tazieff and two other French vulcanologists will work around the crater area of Mt Erebus with New Zealand and United States scientists. Dr R.R. Dibble (seismologist), Dr P.R. Kyle (geologist), Kathy Cushman, J.R. Keyes (field assistant) for Ohio State University, Antarctic Division, C. Monteath (field leader), C.R. Thompson (field leader).

**Geomorphology in Darwin Mountains.** University of Maine, University of Waikato, Victoria University of Wellington. Antarctic Division staff: W. King (field co-ordinator), P. Radcliffe (field leader), P. King, W. Lammerink (field assistants).

A Japanese Antarctic Research Expedition party will work in the dry valleys with New Zealand assistance. Dr T. Torii and co-worker. Antarctic Division field assistant, Annette Richards.

**Army and Ministry of Works.** Scott Base powerhouse installation. V.G. Erridge (M.O.W. supervisor), P. Harrow (M.O.W. engineer), G. Upritchard (M.O.W. electrical overseer) M. Gilmore, D. Cameron, P. Birt, R. Dunnachie, T. Rossiter, J. Leslie, D. Mitchell, W. Christian, R. Barrett (M.O.W.); S. Dixon, R. MAllister, B. Clark, A. Stockwell, R. Young, T. Uriarau, W. Wilson, K. Simpson, G. Nichol, M. Dew (Army construction team, Burnham).

## Three air forces in support

Co-operation between New Zealand, Australia, and the United States to provide logistic support for their respective programmes in Antarctica will begin this season. In late November and early December Hercules aircraft of the Royal New Zealand Air Force and the Royal Australian Air Force will fly between Christchurch and McMurdo Station to share in the airlift of men and materials by United States Air Force Starlifters.

New Zealand's main contribution to the United States—New Zealand logistic pool will be 12 flights, three more than last season, by Hercules aircraft of No. 40 Squadron. For the first time Australian Hercules aircraft will operate through Christchurch and contribute to the United States—New Zealand pool under a tripartite agreement which will allow Australian scientists to be flown from McMurdo Station to Casey Station.

For the four Australian flights this season the R.A.A.F. will use its new C-130H aircraft. In return the United States naval support force will make two flights to Casey Station with Australian National Antarctic Research Expeditions scientists and support staff.

These flights of 2200km by United States Navy ski-equipped Hercules aircraft of VXE-6 Squadron will not be made until later in the season because of the ice runway about 12km inland from Casey Station on the Polar Plateau will not be ready until then.

In preparation for the flights R.A.A.F. crews will participate in one of the courses in basic snowcraft and survival techniques which are provided each season for United States and New Zealand research staff. As in past seasons New Zealand will also provide air crews to load aircraft, and Army cargo handlers will work at Williams Field near McMurdo Station.



# University party to assess coal

A detailed study of the Weller Coal Measures, which include the thickest known coal-bed in south Victoria Land, and an assessment of the coal in strata at the heads of the dry valleys, is one of the main projects to be carried out by university scientists during the New Zealand Antarctic research programme this summer. Other university parties will co-operate with United States scientists in an international project to study the glacial history of the Darwin Mountains area 325km south-west of Scott Base.

Five universities — Auckland, Waikato, Victoria, Canterbury, and Otago — will contribute teams to this season's programme, and will work with scientists from United States, Japanese, and Australian universities. Field parties will study again an isolated Weddell seal colony on White Island in McMurdo Sound, make seismic measurements on Mt Erebus, and seek evidence of past or present infection of Adelie penguins and skuas with influenza viruses. Some scientists will continue work done for several seasons in the dry valleys and their lakes west of Scott Base in Victoria Land, and others will study fish and crustaceans from the waters of McMurdo Sound.

## DARWIN GLACIER

Scientists from the University of Waikato and Victoria University of Wellington will combine with United States parties led by Dr George H. Denton, of the University of Maine, to undertake geochemistry, geomorphology, and sedimentology in the Darwin Mountains, Brown Hills, Tentacle Ridge, and Byrd Glacier regions. Early in November the group will be put in by United States Navy Hercules aircraft to a base camp on the Darwin Glacier near Island Arena, and a subsidiary camp may be occupied on the edge of the Byrd Glacier.

Members of the Waikato Antarctic research unit taking part in this international project which is expected to

involve up to 60 people are: Dr M.J. Selby (geomorphologist), P. Kamp (sedimentologist), D. Lowe (geochemist), and C. Law (petrologist). Dr Selby will lead the party. Two geologists from Victoria University, J. Anderson and C. Burgess, are the other members of the group.

New Zealand's co-ordinator in the international project is an Antarctic Division field leader, W.C. King, who worked with the New Zealand programme in the 1974-75 season. He and three other members of the Antarctic Division field staff, P. Radcliffe (field leader), and P. King and W. Lammerink (field assistants) will be responsible for the field safety of the whole project, and the co-ordinator will be responsible in turn to an American co-ordinator.

## GLACIAL HISTORY

Waikato University's ninth expedition will also operate in the Taylor Valley this season. One of its two main objectives is to study the glacial history of the Darwin Mountains area; the other is to study the slopes upon different lithologies in relation to rock strength and joint spacing.

Glacial history is of some importance because the moraines left by thicker glaciers passing through the Trans-Antarctic Mountains, and by a thicker Ross Ice Shelf, indicate periods of raised levels of the polar ice sheet. If such events can be dated, it will be possible to compare the chronology of Antarctic

glacial history with that derived from ocean sediments and the European loess. From such comparisons it should be possible to define the significance of Antarctic ice fluctuations for world climatic change.

Antarctica is a particularly good place in which to study rock slopes. Not only are they often long and accessible but also the climate has been essentially constant since at least Pliocene times (up to seven million years ago). Thus the problem of varying intensity of erosional processes which confounds studies of slope development in most parts of the world is eliminated.

### LAKE STUDIES

In past seasons Waikato scientists have surveyed lakes in the dry valleys and their sedimentary record. This continuing project will become international during the coming season when Dr C.H. Hendy, a geochemist, will make further geochemical studies in Lakes Bonney and Fryxell in the Taylor Valley, and Lake Vanda in the Wright Valley. Mrs Vivienne Hendy will work with her husband, and at Lake Fryxell they will be assisted by Dr T. Torii, of the Japanese Antarctic Research Expedition, and a co-worker.

Unlike his six colleagues Dr V.B. Meyer-Rochow, of the University of Waikato zoology department, will spend most of his time working from Scott Base as he did last season when he studied the structure and function of eyes of marine organisms living under the sea ice. He will continue his investigations this summer, and will work with Dr Simon Laughlin, a visitor from the Australian National University, Canberra.

This year the two scientists plan to record electro-physiologically responses from the retinae of Antarctic slaters, amphipods and fish. Since it is known from last year's electron microscopical studies that environmental light levels as well as temperature can have profound effects on the ultra-structure of the visual cells, the two vision research scientists wish to deter-

mine how these anatomical changes affect spectral and absolute sensitivity.

Because of the unique light conditions and the extremely constant temperatures which prevail under the sea ice, the scientists believe that Antarctic organisms are ideal for studying certain aspects of vision basic to all seeing creatures. They plan a trip to the Ross Ice Shelf drill site to obtain live material of amphipods which possess large eyes but live below 400m of shelf ice.

### DRY VALLEYS

Eight staff and students, five of whom have had previous Antarctic experience, will take part in the 23rd Victoria University of Wellington expedition. One party will study the glacial sediment in the Taylor Glacier and compare it with basal debris in other dry valley glaciers. It will also sample the sea floor in New Harbour and Granite Harbour to discover which sedimentary processes are most important in McMurdo Sound today.

In past years several parts of the Beacon Sandstone have been studied by VUW staff and students. This year one team will make a detailed sedimentological study of the Weller Coal Measures to produce a model for their deposition, and also investigate the origin and extent of the coal. Another party, which will include Dr Donald Elston, and a colleague, of the United States Geological Survey, Arizona, will take oriented samples of the Beacon Sandstone to establish a magnetic stratigraphy, and a "polar wander path" for Antarctica for comparison with the surrounding continents.

In addition to these projects Dr R. R. Dibble will spend a month on Mt Erebus with the joint New Zealand-French-American party. Dr Dibble, who took part in the first international project on Erebus in 1974-75, will make further magnetic, seismic and visual observations of the inner crater.

For several seasons a Victoria University geologist, Paul Robinson, has been investigating the Taylor Glacier to work out how the rock debris became



**Frozen sand dunes in the Victoria Valley, one of the dry valleys of the McMurdo Oasis where University of Waikato scientists have worked in past seasons. Antarctica is one of the world's largest deserts, but there dunes are a rare phenomenon. The sand is blown out of the valley and then comes back in melt water which flows down from the lower Victoria Glacier.**

University of Waikato photo.

incorporated in the basal ice. He will continue his field work, including final measurements of stakes for ice movement and ablation. Then for the last time he will look at basal debris in other dry valley glaciers to see if his conclusions can be generally applied.

### **BASAL DEBRIS**

A search will be made in the upper Wright and upper Victoria Glaciers, and along the coast between the Koettlitz and Mackay Glaciers for layers of basal debris similar to those in the Taylor Glacier. Paul Robinson will join Dr Peter Barrett and Philip Bently, a VUW field assistant, for the five-week programme of sampling the sea floor in New Harbour and Granite Harbour.

An improved sea floor sampler on loan from the New Zealand Oceanographic Institute will be operated from

the sea ice at the snouts of glaciers calving into McMurdo Sound. The party, which will work through holes cut with chain saws will also examine icebergs frozen in along the coast for whatever rock debris they might hold. Debris melted from icebergs is believed to be an important source of sediment in the Ross Sea, but there is very little data on its texture or composition.

Next season another attempt will be made to drill into the seabed sediments of McMurdo Sound using the annual sea ice as a drilling platform. Dr Barrett's party, which will include an Antarctic Division field assistant, Stewart Ross, will inspect possible drill sites for future McMurdo Sound sediment and tectonic studies while it is travelling on the sea ice.

VUW expeditions have studied several parts of the Beacon Sandstone in

previous seasons. This year Andrew Pyne, a geologist, and a VUW field assistant, Chris Mroczek, will examine the Weller Coal Measures, a Beacon Sandstone formation interbedded with thin bituminous coals. The strata of the formation contains an abundant and widespread *Glossopteris* and *Gangamopteris* flora, which dates the Weller Coal Measures as Permian (225 to 280 million years old).

### COAL MEASURES

Information about the character of the Permian flood plain will be used to assess the extent of the coal. Both the paleomagnetic and the coal measures parties will work first at Mt Bastion where the Weller Coal Measures is well-exposed over a distance of several kilometres.

From Mt Bastion the coal measures party will fly to Mt Fleming. There the formation is extensively exposed on two ridges with a major cirque between. The sequence includes the thickest known coal bed in south Victoria Land. Beds of sub-bituminous coal up to 7m thick occur there.

Mt Bastion has the thickest and most complete section through the Permian and Triassic part of the Beacon Sandstone, and therefore has been selected by Dr Chris Christoffel and his field assistant, Peter Garden, for their sampling programme for paleomagnetic determinations. They will take oriented samples regularly through the 800m thickness, and will measure from each the position of the earth's magnetic pole at the time of deposition.

From these measurements it is hoped to establish a polar wander curve for Antarctica. Previous attempts have been complicated by the heating effect of the Triassic dolerite intrusions, but Dr Christoffel believes he can remove these.

### SANDSTONE SAMPLES

After its work at Mt Bastion the paleomagnetism party will fly to Beacon Heights where the section from the New Mountain Sandstone (Early Devonian,

345 to 395 million years) to the Weller Coal Measures is well exposed in a continuous section just over 1000m thick. At least 100 oriented blocks of sandstone will be taken at both Mt Bastion and Beacon Heights for drilling and measurement in Wellington.

Upper atmosphere research is a new project in the University of Canterbury research programme, but the main projects will be biological — a study of the isolated Weddell seal population at White Island, and a continuation of the productivity study started in the 1976—77 season. Biological studies will also be continued at Cape Bird.

This month Tas Carryer, who flew south on September 1, will visit White Island for one week with a member of the winter party from Scott Base. Using hydrophones through a hole in the ice, they will attempt to prove whether the seal population winters in isolation at the island. A small wannigan will be towed to the island and will be retained for the whole season.

Under the direction of Professor G. A. Knox the Canterbury team will monitor all seal movements and numbers around the island. There will be a continued study of the food chain dynamics of the ecosystem under the ice, and further studies will be carried out on the primary productivity and seasonal succession of the tide crack community. A second wannigan will be towed to the island next month for use as a laboratory.

### ISLAND SURVEY

Professor Knox and Tas Carryer will make a helicopter survey of Heald and Hahn Islands to see if seal populations exist in similar conditions to those at White Island. Camp sites, etc., will be reviewed with the possibility of a future project being set up in the area.

Dr Laurence Greenfield, of the university botany department, will study the biomass of the microbial population during his visit to White Island in November and December. Other members of the zoology party are Michael Summerlee, a biology teacher in Christ-



church, Charlotte Holmes, a zoology graduate who took part in the university's 1974-75 expedition to the Snares Islands in the sub-Antarctic, Jennifer Bassett, a research assistant, and Graham Sandlant, who is studying for a master's degree in zoology.

Last season Graham Wilson collected ectoparasites from penguins at Cape Bird, studied leopard seal behaviour, and carried out the annual penguin and skua census. This season he will study killer whales and monitor their fin shapes in an attempt to relate them with sex, body size, and maturity. He will also make observations of leopard seals and visiting sea birds such as snow petrels.

### PENGUIN CENSUS

Recording of banded birds, and the penguin and skua census will again be part of the Cape Bird programme. In addition Dr Frank Austin, of the microbiology department, University of Otago, will investigate Adelie penguins and skuas for evidence of past or present infection with influenza viruses.

Two Japanese zoologists will join the group to compare the behaviour of Adelie penguins at Cape Bird with that already observed at Syowa Station. Dr Stephen Aoyanagi, who teaches biology at the National School for the Blind, Tokyo Kyoiku University, studied Adelie penguins at Syowa Station when he was with the 13th Japanese Antarctic Research Expedition in the 1971-72 summer. His companion is Yasuomi Tamiya, who is studying for a doctorate.

Upper atmosphere research will be carried out by two University of Canterbury physicists working from Scott Base. Dr H. A. von Biel, and Graham Lees, a technician in the physics department, will instal an antenna array and instrumentation at Arrival Heights to investigate the polar D region of the ionosphere. The new station, which will be the only one in the Antarctic, will be linked with the department's station near Christchurch, and similar stations in Australia.

Two zoologists from the University of Auckland, Dr John McDonald and Dr Rufus Wells, studied the metabolic adaptations of Antarctic fishes and invertebrates to constant low temperatures. The object of the project was to determine how the conduction of the nervous impulse and the transport of oxygen by the blood were affected by constant low temperature.

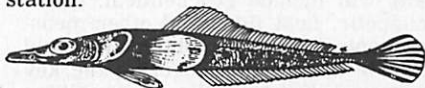
This season's programme will consist of two separate physiological projects; one on neurophysiological adaptations carried out by Dr McDonald, and the second on haematological adaptations in oxygen transport, which will be the responsibility of three haematologists, Neil Christensen, Stuart Duncan, and Michael Ashby.

## Japanese to film in Antarctic

New Zealand scientific research in Antarctica will be filmed for Japanese television this season. A team of three men from the Japanese Broadcasting Corporation (NHK) will fly south in November to gather material for a documentary which will be part of a series of television programmes on scientific research in Antarctica for screening in January next year.

NHK's team of producer, cameraman, and video engineer will visit Scott Base, Vanda Station in the Wright Valley, and New Zealand parties in the field. The team will be able to film Japanese scientists working with New Zealanders at Cape Bird on Ross Island, and possibly at Lake Fryxell in the Taylor Valley.

For its series of programmes NHK plans, with Japanese Government co-operation, to set up an earth station for the receipt of satellite transmissions from Syowa Station, the Japanese base off the Prince Olav Coast of Queen Maud Land. The transmissions will include the first live broadcast from the station.



# Second attempt to drill in McMurdo Sound

A second attempt to drill into the seabed sediments of McMurdo Sound using the annual sea ice as a drilling platform will be made by United States, New Zealand, and Japanese scientists in the summer of 1979-80. The international project, initiated by New Zealand, will be known as the McMurdo Sound Sediment and Tectonic Study (MSSTS). It is an extension of the Dry Valley Drilling Project, a three-year programme developed between 1971 and 1976 by scientific organisations of the United States, New Zealand, and Japan to obtain a better understanding of the Cenozoic geological history of the McMurdo Sound area.

Cracks in the annual sea ice round the drilling rig, the presence of gas containing 38 per cent methane, and an increase in temperature, ended the first attempt to drill in McMurdo Sound. After two weeks' drilling the operation was stopped on November 21, 1975 when 65m of core had been recovered. But a number of technical problems were overcome, and geologists and drillers considered that the experience gained should make for a much more successful programme.

Full support for further drilling in the McMurdo Sound area to provide a continuous record of past geological and climatic events was expressed by United States, New Zealand, and Japanese scientists and administrators at the third Dry Valley Drilling Project seminar held in Tokyo in June this year. The primary scientific objective of the new project is to drill through the thick sedimentary sequence off New Harbour in McMurdo Sound to obtain a record of early glacial history and the uplift of the mountains along the Trans-Antarctic Mountain chain.

Additional projects in the programme, planned to begin in October, 1979, will include geochemical, paleomagnetic, heat flow, and other measurements. The data obtained should provide information covering the key time period of 50 million to 10 million

years ago.

After the evacuation of the drilling site, 70km north-west of Scott Base, in 1975, the drill rig was dismantled and essential components were returned to McMurdo Station by United States Navy helicopters. Some equipment was hauled by sledge to Marble Point, 30km east of the site, and to New Harbour.

This season Mr J.H. Hoffman, of the Geophysics Division, D.S.I.R., who has been in charge of all the previous DVDP drilling operations, and Mr L. Olliver, who has been supervisor of the New Zealand drilling teams, will go south to prepare for next year's drilling programme. They will visit Scott Base and McMurdo Station to check the condition and operation of the DVDP drill rig. A team from the winter party at Scott Base will also survey ice conditions between the base and Marble Point this month.

Co-ordination of scientific programmes in next year's project will be undertaken by Dr P.J. Barrett, Antarctic research centre, Victoria University of Wellington, Wellington, New Zealand. Scientists who wish to participate can write to him direct. Mr R.B. Thomson, superintendent, Antarctic Division, D.S.I.R., P.O. Box 2110, Christchurch, will be responsible for co-ordinating the logistics of the project.

## Second stage in rebuilding Scott Base

Work on the second stage of the five-year programme for the rebuilding of Scott Base will be the main construction task in the New Zealand Antarctic research programme this summer. Between November and early February a construction team from the New Zealand Army and the Ministry of Works will erect a new powerhouse, and instal two new diesel generators and mechanical and electrical services.

By the 1979-80 season the feeding of hungry snow melters to provide fresh water for the base, which has been a full-time job for two men every season in the last 22 years, should be a thing of the past. Now under test is a reverse osmosis unit to distill fresh water from sea water. This filter plant will produce about 6500 litres of fresh water daily. In reserve will be an ice melter unit warmed by waste heat from the powerhouse.

Built of steel-clad polyurethane foam sandwich panels bolted with synthetic bolts to a steel portal frame, the prefabricated powerhouse building will also contain workshops and servicing areas. The floor level of the building will be about 1m above ground level to prevent the accumulation of drifting snow.

Heat, light, and power for the base will be provided by two generators, each with a generating capacity of 135kw. A standby unit of similar size will be accommodated temporarily in the present powerhouse until the new garage block is built.

Waste heat from the main units will be used eventually to heat the whole base with a boil and standby plant to provide additional heat as and when required. Some of this heat will be passed through ducts under the walkway floor where services such as water and power reticulation will also be installed. More of the room heat will pass through ducts outside to the fresh and salt water tanks and into external jackets to prevent

freezing.

Fire protection will consist of automatic heat and smoke detector units. A sprinkler system operated from a 200-gallon nitrogen pressurised tank will also be part of the protection system.

Last summer the first stage of the rebuilding programme was completed — the internal work on the summer laboratory — a two-storey prefabricated accommodation and scientific block, which was erected in the 1976-77 season. The third stage of the programme, which is expected to go ahead in the summer of 1979-80, will be the construction of new sleeping quarters and ablution facilities for about 44 people. When this building is completed the next task will be to demolish the old sleeping quarters to make way for a new messhall and kitchen.

Some of the material for the second stage will be flown south from Christchurch early in the season so that reconstruction can proceed during the early summer months. The rest will be shipped from Lyttelton later in the season.

Ten men from No. 3 Squadron, Royal New Zealand Engineers, will work on the powerhouse project this summer. Installation of the generators, and the mechanical and electrical services will be the responsibility of the Ministry of Works. It will provide 12 men for the project, including an engineer, an architect, an electrical overseer, and fitters and electricians. Mr V.G. Erridge, a Ministry of Works building overseer, will be in charge of the rebuilding team.

Other building work in the New Zealand programme will include the transport of two wannigans to White Island, about 30km from Scott Base. These will provide facilities for the work of the University of Canterbury biological unit on the island's Weddell seal population.

# Sunshine and Avocadoes on Ross Island

Ice-cream and avocadoes, letters from home, and bright spring flowers, made August 29 almost a spring day for 74 Americans, 10 New Zealanders and one Australian on Ross Island when two ski-equipped Hercules aircraft arrived from New Zealand to bring them their first direct contact with the outside world for more than six months. Seven flights were completed early this month by United States Navy VXE-6 Squadron aircraft to prepare for the United States and New Zealand scientific programmes of the 1978-79 season.

Although the sun had returned by the time the first aircraft arrived — it appeared over the horizon on August 19 — spring still seemed far away. Temperatures were low last month, and there were only about four hours of daylight each day. But the men — and one woman who also wintered on Ross Island — forgot about four months without the sun when they saw new faces, read all their mail, and tasted fresh fruit and vegetables again.

This year two of the flights of the operation known to the United States naval support force as Winfly (winter flights) were completed before the southern spring began officially on September 1. The first aircraft, carrying long-awaited personal letters, 1460kg of them, left Christchurch in the early hours of August 29 and reached Williams Field, McMurdo Station, before noon on a clear, cold day with a wind of only five knots. The temperature was minus 46deg Celsius, a few degrees higher than the usual low temperatures recorded in August.

Originally the Winfly flights were to have been completed on the first day of spring. But two aircraft had to turn back to Christchurch after four hours on August 31 because of ice fog and whiteout conditions at McMurdo Station. Two flights were made on September 1. Then, after a break of two days because of more bad weather, the last two flights began on September 4. But one aircraft had to return, and as a result two aircraft made one more flight

than originally planned on September 6.

In their seven flights south the Hercules aircraft carried 24.72 tonnes of cargo south. This included 2267 kg of mail, and 3175kg of fresh food. Among the 141 passengers were scientists who will make an early start on summer research projects, and technicians, construction workers, and others, who will prepare for the major airlift by Hercules and Starlifter aircraft which begins next month. The first flights brought the spring population of Ross Island to more than 220 at McMurdo Station and Scott Base.

Captain D.E. Westbrook, the United States Navy's new support force commander, flew in the first Hercules to meet the 73 men and one woman of the McMurdo Station winter party and to initiate preparations for a busy summer season. Also on the aircraft, which was flown by VXE-6 Squadron's new commanding officer, Commander W. Morgan, were two New Zealanders, Messrs R.B. Thomson (superintendent) and G. Varcoe (building and services officer), Antarctic Division.

New Zealanders on a later flight to begin essential work before the summer season brings the annual influx of scientists to Scott Base were Messrs R.S. Garrick (Gore), and T.J. Carryer (Christchurch). As carpenter at Scott Base this summer Ron Garrick's first task is to complete the new biology laboratory building. Tas Carryer will begin early next month the first stage of

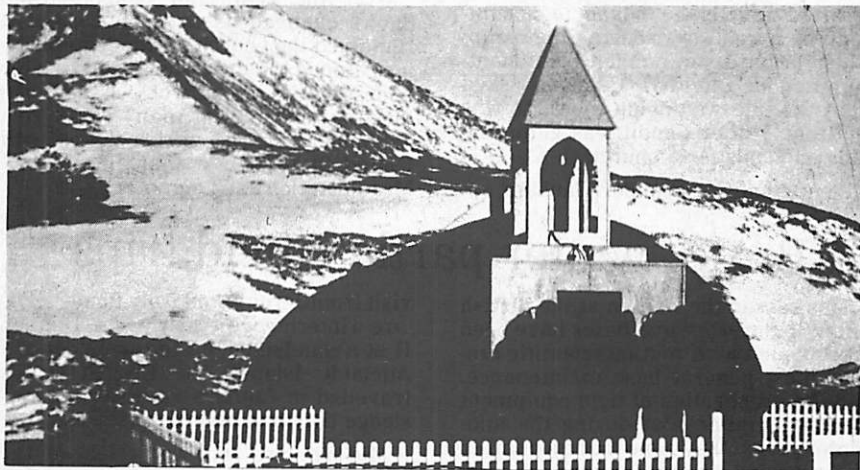


the University of Canterbury expeditions study of the Weddell seal population on White Island.

Winter parties on Ross Island always welcome the sight of new faces after their isolation, but mail comes first, and that is why it was carried on the first aircraft. After the news from home comes fresh food, particularly milk and fruit. This year the cargo on the first flights included avocados, 500 litres of fresh milk, yoghurt, 227 litres of ice-cream (vanilla flavour) and spices to relieve the shortage in the the McMurdo Station galley.

For the ten New Zealanders and one Australian at Scott Base the first aircraft brought 48 litres of milk, vegetables, 36 pottles of yoghurt, and 12 cheesecakes. To enable him to keep baking bread the cook, Russell Arnott (Queenstown) received a welcome consignment of fresh yeast.

Spring flowers — carnations, daffodils, tulips, and ranunculi — a gift to Scott Base from a Christchurch flower market, were almost as welcome to the winter team as their mail and fresh food. They were the first flowers the men had seen for nearly a year.



As it was in the beginning. The Chapel of the Snows in the summer of 1956.

U.S. Navy photo.

## Fire destroys McMurdo chapel

Antarctica's first church — the tiny Chapel of the Snows on Ross Island — was destroyed by fire in the early hours of August 23. Since 1956 it had been a place of worship for thousands of Americans who lived and worked at McMurdo Station, and at nearby Scott Base.

In less than three hours after the alarm was given at 5 a.m. the chapel was reduced to a heap of smouldering ruins. All that was recovered were the chapel bell and small religious items, damaged by the flames. Also lost in the fire were the chapel organ and records

of United States activities on Ross Island since 1955.

McMurdo Station's fire-fighters used dry powder and a water truck to fight the fire which, apparently, began in the rear heater room area. Strong winds hampered their task.

A D8 bulldozer and a front end loader were also used to dump snow on the fire, and to level the remains of the building so that the fire would not spread to adjacent buildings or damage the communication lines. By 7.40 a.m. all that was left of the 22-year-old structure had been pushed into a smouldering

heap.

There were no plans or materials for a church in the 1955-56 season when United States Navy Seabees began construction of the buildings of McMurdo Station, known then as Naval Air Operating Facility, McMurdo. Religious services were to have been held in the mess hall, but Father John C. Condit, one of two chaplains who wintered at McMurdo Station and Little America in 1956, had other ideas.

As construction of the main buildings progressed a mysterious pile of timber, planks, nails, Quonset hut sections, and assorted materials, began to accumulate on a knoll overlooking the camp. When the base commander, Lieutenant-Commander David W. Canham, asked what the pile was doing there, he was told that Father Condit was gathering odds and ends for a church.

Lieutenant-Commander Canham ap-

proved of the idea, but emphasised that every man had to work a 12-hour day to complete the camp on time. It had to be ready for the winter party. Then the men could work on the church.

But Father Condit, as a chaplain, was both a fisher and a leader of men. So, after a hard day's work, the men would drift over to the church site, and before the main camp was finished a tidy, neat church with a steeple stood on the knoll. Later it even had a bell, procured from one of the two small fuel barges frozen in at the foot of Hut Point.

Over the years the Chapel of the Snows changed its appearance, but it remained the church for all denominations among the men who worked winter and summer in the world's southernmost parish. And for many years New Zealanders shared parish duties with United States Navy chaplains at McMurdo station each summer.

## B.A.S. winter parties' field trips

This season the 70 men at the British Antarctic Survey's five bases have been preoccupied with routine scientific programmes, general base maintenance, and the preparation of field equipment for the summer. But during the mid-winter period they have made a number of short trips, chiefly for recreation.

On South Georgia several localities around Cumberland Bay were visited by boat from Grytviken. Further south, the consolidation of the sea ice in July enabled parties to travel to Coronation Island from Signy, and marine biologists at the base were able to begin their usual winter programme of diving through the sea ice.

Parties also visited Petermann Island from Faraday (Argentine Islands), and the old B.A.S. bases on Horseshoe Island at the entrance to Square Bay, and Stonington Island in Marguerite Bay, from Rothera. Another party from Rothera travelled overland to the north of Adelaide Island.

Men at Rothera had the unexpected pleasure of feminine company for a few days at mid-winter when they received a

visit from Jerome and Sally Poncet, who are wintering with their yacht, Damien II at Avian Island, off the south coast of Adelaide Island. The French couple travelled to Rothera on a sail-assisted sledge they had built themselves.

Mid-Winter's Day was celebrated in appropriate style by all the bases, but the three B.A.S. geologists stranded in February at the Argentine base, General Belgrano, were surprised to find that the day was not included officially in the local fiesta calendar. However, it was hastily added in their honour, although there was hardly room to fit it in between the celebrations of Army Day and Argentine Flag Day in June, Independence Day in July, and surprisingly, Father's Day.

But for the 20 Argentinians wintering at General Belgrano the day is locally appropriate because a number of the Argentine Army men are married and have families. Not lacking ingenuity, the Argentinians also celebrated the elapse of six months since their arrival at the base, and six months to go before their departure.

PRELUDE TO SPRING

# RETURN OF SUN TO ROSS ISLAND

Isolation, darkness, and cold, are common elements in the life and environment of men — and women — who winter at American and New Zealand bases in Antarctica. But those who winter do not enjoy the same weather at their respective stations. This year 111 Americans and New Zealanders, and a Soviet exchange scientist, have wintered at four bases; the only weather experience they all share is the return of the sun.

Most remote and smallest of the American bases is Siple Station, far away in Ellsworth Land, and 2297km by air from McMurdo Station. There five men have reported many days of ice fog and blowing snow. But they have had compensations — on cold, clear nights the sky has been filled with the mystical lights of the aurora. On the debit side has been the disappearance of the fizz in the champagne opened to celebrate mid-winter.

There are 19 Americans, two New Zealanders, and one Soviet scientist at the Amundsen-Scott South Pole Station. They have spent their winter in the shelter of a geodesic dome which houses most of the station buildings. There has been little snow, but this year the South Pole has been truly a Pole of Cold to the men still living there. In May and June the mercury in the thermometer has passed the century mark (minus 100deg Fahrenheit or minus 73.3deg Celsius). And August 4 was so cold that the thermometer recorded minus 107.68deg F or minus 77.6 C.

Spring and the first light of the sun arrived earlier 1327km to the north on Ross Island where McMurdo Station still has its winter population of 73 men and one woman. Before the sun was sighted on August 19 the winter story was one of snow, high winds, and violent gusts, one of 92 knots on June 17 being the second strongest recorded in the last 22 years.

Scott Base over the hill at Pram Point has not been swept by gales like

McMurdo Station. But the 11 men of the winter party and their 17 huskies have had a cold winter, although clear skies and auroral displays have been some compensation. August was the coldest month of any since temperatures were first recorded at the base in 1957, and the month was also the coldest August since 1959.

Spring, the end of isolation, and mail and fresh food came to Ross Island at the end of last month. The 22 men at the Pole Station will see the sun towards the end of this month; the mail and fresh food will not arrive until early November.

## COLDER DAYS

After the coldest temperature of the year on May 10 when the thermometer recorded minus 71.0deg (minus 98.8deg Fahrenheit) the remaining days of the month were comparatively milder. The real bite of winter began early in June.

On June 10 the temperature dropped to minus 71.6deg, and there were hopes of hitting the century mark (minus 100deg F). But the temperature promptly climbed to minus 50deg. The colder weather brought spectacular auroras with red the most predominant colour.

As a preliminary to Mid-Winter's Day, which marks the turn of the Antarctic year, temperatures began to drop around June 18 to well below minus 70deg. The cold spell lasted for three consecutive days, and on June 22 the maximum low was minus 75.2deg (minus 103.36deg F).

Before the traditional Mid-Winter's Day celebration, marked by a huge feast and general relief that half the winter had gone by, 18 men qualified for membership of the South Pole's unique Club 300 on June 19. Like last winter's 16 new members they sat in the station sauna at a temperature of plus 200deg Fahrenheit, and then dashed out bare to be photographed in temperatures of minus 100deg F (minus 73.3deg C) or lower.

### SOUTHERN LIGHTS

Temperatures below minus 73.3deg marked the start of the last week of June. By the middle of the week, however, the weather warmed, and the mercury climbed to minus 45deg.

July was a quiet month with the celebration of American Independence Day on July 4 the only social event. On July 14 after nearly a month with barely a sign of auroras there was a most colourful and spectacular display late at night. Photography was impossible because of high winds and the speed with which the aurora moved across the night sky.

Temperatures remained near the minus seventies until the third week when winds up to 32 knots and drifting snow lifted the low reading to minus 63.9deg, and the high to minus 44.5deg. In the last week the temperature dropped back to minus 69deg. The station staff did a rubbish disposal run by the light of a full moon, and celebrated 99 days at the Pole with a party, and 99 cans of beer for the 18 Americans, two New Zealanders, and one Russian.

Another Fahrenheit century was scored early in August when a low of minus 73.9deg was recorded. Then the mercury really tumbled on August 4, which displaced June 22 as the coldest day of the year. The thermometer recorded minus 77.6deg (minus 107.68deg F).

By the middle of the month everyone was starting to look forward to the first brightening of the horizon, an indication of the return of the sun which had not been seen since March 23. It is expected some time in the third week of this month.

South-east winds up to 40 knots, ice fog, and blowing snow marked the last week of May at Siple Station. A large quantity of ice and snow had to be hauled out of the station, and the men continued their bi-weekly task of knocking down enormous icicles bred by heat from the exhaust chimney of the generator shack.

By the beginning of June five days of light powder snow had left drifts of up to 91cm across the top of Siple I, and walking was almost impossible. John McKinnon, the station engineer, reported that film watching, regarded as frivolous in summer, was now a favourite pastime, and nearly 30 classic films of the late 50s and early 60s were being shown almost nightly to a critical audience (of five).

Numerous auroral displays were observed in the first days of June when the temperature dropped to minus 47.73deg. A cache of yo-yos was uncovered and provided a perfect winter sport for Siple although lights and furniture occasionally suffered from the efforts of over-eager tricksters.

### WITHOUT FIZZ

After a week of ice fog and blowing snow the approach of Mid-Winter's Day was marked by a brilliant full moon, clear skies, and warm temperatures. By the actual day the expensive fizz had leaked out of the champagne opened for the occasion, but John McKinnon reported that nobody refused to drink a toast. On June 22 the isolation of the party, and the six at Palmer Station was broken when they were interviewed "live" by the B.B.C.

Ice fog at ground level, blowing snow, and winds to 33 knots accompanied the last days of June, and continued into July. But in the second week the skies were mostly clear with frequent auroras. In the third week a steady wind up to 45 knots from the north-west brought unusually warm temperatures ranging from minus 25.5deg to minus 13.8deg.

Temperatures dropped again in the last week, and remained comparatively



low in the first days of August. Then the ice fog and blowing snow returned with temperatures ranging from minus 42.2deg to minus 30.5deg.

Because the wind speed gauge on the anemometer was blown down measurements in early August were admitted to be not precise. The staff had the difficult task of going out into a gale to measure the force of the wind with a hand held anemometer.

### EARLY DARKNESS

Early winter darkness at McMurdo Station was accompanied by high winds, low temperatures, and snowfalls in the last two weeks of May. A storm on May 20 and 21 brought 5.1cm of snow and a peak gust of 66 knots. Then from May 24 to May 26 there were strong winds and 6.2cm more snow.

May ended with high winds, blowing snow and a peak gust of 63 knots. The snowfall for the week to June 2 was 18.7cm. The weather pattern was unchanged until June 16. Then came storm with visibility near zero and winds in excess of 90 knots.

Another storm followed on June 18 with more snow and blowing snow. In the week to June 23 the total snowfall was 13.2cm, and a peak gust of 92 knots on June 17 was the second highest wind ever recorded at McMurdo Station.

After a spell of bad weather with winds and blowing snow, June ended with 21.8cm of snow in the last week. July began with excellent weather and no snow. For Independence Day the thermometer co-operated, and the temperature rose to minus 15.0deg.

Light falls of snow were recorded in the second week of July, but lower temperatures. Then more winds, ice fog, and still low temperatures marked the third week. There was a peak gust of 48 knots on July 28, and temperatures remained relatively high until the end of the month.

### FAINT GLOW

After three months without the sun a vermilion glow in the north-east sky early in the last week signalled faintly

the approaching end of winter. But winter still retained its grip, and August started with colder temperatures, gusty winds, and ice fog.

Before the sun was first sighted on August 19 the familiar pattern of ice fog, blowing snow, and strong winds, did not change, and the temperature remained below minus 47deg. Early in the month the winter team began the annual task of preparing the ice skiway and the buildings at Williams Field for the first of the Winfly flights. A long cavalcade of bulldozers, loaders, graders, and heavily laden sledges made their way slowly to the field on July 22 in readiness for the task.

### QUIET ROUTINE

Like their neighbours over the hill the New Zealanders at Scott Base had plenty of work to do in June both inside and outside the buildings. The month passed quickly, and the quiet, regular routine was broken only by Mid-Winter's Day celebrations and three birthdays.

Although June is the darkest time of the winter some optimists at the base claimed that the twilight was brighter two days after the mid-winter celebrations. In their support a bright band in the sky over Cape Crozier at noon was a reminder that the sun was somewhere up there and approaching. And the weather during the month was fairly normal with a maximum temperature of minus 8.2deg on June 6 and a minimum of minus 42.6deg on June 30. The peak gust recorded was 73 knots on June 17.

Outside Scott Base on Mid-Winter's Day the sky was cloudy, there was snow, and the temperature was minus 23deg. Inside John Lythgoe and his men celebrated the shortest day of the year in traditional style. Oyster soup, scallops, roast lamb and apple pie were presented for dinner by the cook, Russell Arnott, of Queenstown, who will be cooking for the Governor-General when he returns to New Zealand next month.

Russell also baked a fine fruit cake and iced it to represent a view of the

base at night complete with an aurora lighting the sky behind Mt. Erebus. And some of the toasts were drunk from glasses of the cook's home-made raspberry wine.

There was a second mid-winter dinner for the New Zealanders on June 22 because they were invited over the hill to join the celebrations at McMurdo Station. Only the huskies at the base were out of luck on Mid-Winter's Day. They were not involved in the celebrations because they are fed every second day, and June 21 was not the day.

Towards the end of the month the temperature was fluctuating around minus 20deg to minus 30deg, but the coldest weather was yet to come. The usual clear skies and low temperatures arrived as expected in the first weeks of July, and by the middle of the month there was definitely a striking red band over the horizon which provided glowing morning skies for everyone to photograph.

Work around the buildings and preparations for the new season kept everyone busy during July, but social activities and individual hobbies were not neglected. On July 4 the Americans celebrated their Independence Day, and there were minor skirmishes and raids by parties from each base. Flares and fireworks lit up the sky over McMurdo Station to end an eventful day.

By comparison the celebration of Ross Dependency Day on July 29 was a more sedate affair. It was celebrated with an indoor barbecue, and provided an opportunity to return American hospitality. And during the month the New Zealanders reversed the story of the man who came to dinner. John Lythgoe invited a woman to come to dinner at the base. She was Miss Sue Williams, of the University of Texas, who has 73 male colleagues at McMurdo Station.

### FULL MOON

A full moon in the latter part of the month lent an appearance of unreality to the landscape, and Warwick Williams the Scott Base Australian technic-

ian, and John Thomson, the base engineer, made full use of the adequate lighting to ski round the local area and record the remarkable scenery on film.

As expected temperatures for the month were low. The mean temperature was minus 31.3deg, and the mean minimum was minus 38deg. On July 9 the temperature dropped to minus 50.2deg. The highest temperature recorded was minus 10.7deg, and the mean maximum for the month was minus 24.5deg.

This winter Scott Base had an additional inhabitant. One of the huskies, Kuia, was allowed to remain inside because she was expecting. In July the men who had her company reported that mother and two pups were doing well.

August was notable for the steady return of daylight, from a couple of hours a day at the beginning of the month to more than four hours towards the end. The weather was particularly cold with temperatures as low as minus 50deg to minus 55deg. But the cold did not stop trips up Ovservation Hill and to Arrival Heights to see the rising sun. It first peeped over the horizon on August 19, but could not be observed from the base until later in the month because of the intervention of Mt. Erebus and Hut Point Peninsula.

With the approach of spring and more daylight outside activities increased. The dog handler, Steven Chambers, made several sledge trips with his charges, travelling as far as Williams Field and Hut Point despite the low temperatures. The winter party athletes, John Lythgoe and Warwick Williams, resumed their cross-country running along the road to Williams Field, and others started skiing, mainly on the sea ice.

To end the official winter, and make the winter party of 1978 remember their stay at Scott Base, the meteorological technician, Will Kimber, produced his temperature readings for August, which showed that the month had been the coldest on record by three degrees. The mean temperature for the month was minus 40.8deg compared with minus 37.8deg in September, 1968.

# CONTROL OF MARINE RESOURCES

Although the 13 Antarctic Treaty nations are committed to establish a definitive international regime for the conservation of Antarctica's living marine resources before the end of this year, they have made only limited progress towards that end in the last six months. The first session of the second Antarctic Treaty consultative meeting in Canberra did agree that an international conservation commission should be established; its main achievement was to produce an informal text for further negotiations.

Basic support for the informal text came from all the nations and interests involved, but there were some serious differences at the discussions in Canberra, mainly on the questions of future exploitation or conservation of marine resources. When the meeting resumed in Buenos Aires there was practically no agreement on any subject because of endless arguments over sovereignty.

Delegates from the treaty nations did agree in principle to meet again in Washington this month. A final conference on the conservation issue will be held in Canberra in December.

When the delegates from Argentina, Australia, Belgium, Chile, France, Japan, New Zealand, Norway, Poland, South Africa, Britain, the Soviet Union, and the United States first met in Canberra earlier this year they did codify submissions from eight countries into a single negotiating text. This text was designed to strike a balance between rational use and conservation of Antarctic marine resources, and to provide for a commission to oversee the harvesting and conservation of the living resources. The informal text was prepared by the chairman, Mr John Rowland, Deputy Secretary of the Australian Department of Foreign Affairs, at the request of the meeting.

Although the informal text was not made public, it is known that the draft provided for a commission representing

all adherents to the conservation convention that could set annual catch quotas. A special scientific committee would assist the commission, assessing the effects of harvesting, and their relationship to the delicately-balanced Antarctic ecosystem.

Delegates agreed that the convention should reflect close links with the Antarctic Treaty, and that the activities of the proposed convention should harmonise with the responsibilities of the treaty nations for the protection and preservation of the Antarctic environment. The need to take account of other relevant international agreements was also recognised.

Provision for participation in the convention by such international organisations as the Food and Agriculture Organisation of the United Nations, was implied in the press statement issued by the meeting. Mr Rowland said also that there would be ample opportunity for any nation with an interest in the rational use and conservation of Antarctic marine resources to take part in the commission's activities.

Claims to national sovereignty in the Antarctic remained unchanged after the discussions of the first session, delegates having agreed that the status of claims should remain the same as in the Antarctic Treaty. But the issue of sovereignty caused much of the disagreement at the second session in Buenos Aires, which took place in July.

Delegates were told by the Argentine Foreign Minister (Mr Oscar Montes), who opened the session, that the planned conservation convention could not ignore the Antarctic's political realities. Later the 13 nations began to differ on the scope and nature of the convention, whether it should take into account existing territorial claims, and whether it should apply to all countries and not only to those which signed the Antarctic Treaty in 1959.

Seven countries which claim sovereignty in Antarctica — Britain, Australia, New Zealand, Norway, France, Chile, and Argentina — are reported to have urged that limits on the commercial exploitation of krill and other marine resources should be imposed immediately. Opposition to this came mainly from the Soviet Union, Japan, and Poland, which plan to increase their harvesting of marine resources, chiefly krill on which the total ecosystem leans heavily.

There was agreement that limits on the extraction of renewable resources, affecting fishing zones, seasons, species and quantities, should be set according to scientific principles, not according to the market. But the main concern of the delegates was the future exploitation of krill, the richest resource in Antarctic waters. This question was still unresolved when the meeting ended.

### KRILL RESOURCES

Full-scale exploitation of krill resources has not yet begun. Japan and the Soviet Union have long been active in harvesting, having begun on a small scale in the early 1960s. In the last two years they have been joined by a number of other nations, although still on a relatively moderate scale.

Now five Antarctic Treaty nations, in addition to Japan and the Soviet Union, are engaged in research related to the exploitation of krill or experimental catching. Most active of these five has been Poland, which was admitted as a consultative member of the Antarctic Treaty last year. It has sent expeditions south each season since 1975-76, and

plans a fourth this season.

Britain, the United States, Norway, and South Africa, have all placed more emphasis on krill research in their Antarctic scientific activities. Chile also has engaged in experimental fishing and research, and has developed krill products for commercial marketing.

West Germany, which is expected to become a consultative member of the Antarctic Treaty next year, has started an extensive programme of fisheries research, with emphasis on krill, in southern waters. In the 1975-76 season its first expedition consisted of the research ship Walther Herwig, specially equipped for development work on fishing gear and methods, and the chartered stern trawler Weser. Argentine, British, and French observers were on board the ships which worked in the Scotia Sea between South Georgia and the South Orkney Islands, close by the Antarctic Peninsula, and in the Weddell Sea.

### BIG CATCHES

Because of high rates of catch in the 1975-76 season, and the future use of long-range fishing fleets affected by the declaration of economic zones, investigations of krill were intensified and expanded in the 1976-77 season. Japan sent five or six vessels to the Antarctic, including one chartered to the Japanese Marine Resources Research Centre.

Poland's second expedition, organised like the first by the Sea Fisheries Institute, Gdynia, was increased in size. In 1975-76 it consisted of the research vessel Professor Siedlecki and the chartered stern trawler Tazar. For the 1976-77 expedition three more stern trawlers, the Manta, Gemini, and Rekin, were chartered. Other Polish fishing vessels also visited the Southern Ocean.

Other nations outside the Antarctic Treaty which entered the field were East Germany and Taiwan. A large East German trawler worked in the waters near South Georgia, and the Taiwan Fisheries Research Institute sent the 700-tonne research vessel Hai



Kung into the Weddell Sea. Working in the Enderby Land area for 18 days early in 1977 she caught 135 tonnes of krill.

Chile engaged in krill fishing, using a chartered Spanish stern trawler, and another treaty nation, Norway, which sent a scientific expedition to Queen Maud Land in the 1976-77 season, engaged in krill research. Scientists worked from the Polarsirkel in the Weddell Sea.

### MORE SHIPS

Because the activities of some nations in the Southern Ocean combine fishing and research, detailed information on the extent of their krill harvesting is not always readily available. But last season eight nations, six of them Antarctic Treaty members, were reported to be active in the field. They were Britain, the United States, the Soviet Union, Japan, Poland, South Africa, West Germany and Taiwan.

Japan had at last 10 experimental krill harvesting ships working in groups in southern waters. One of these ships, the Otsu Maru, began harvesting early in December at 56deg 57min S/112deg 29min E. She met the research ship Bansyu Maru five days later, and on January 1 was reported at 63deg 30min S/130deg 42min E.

West Germany's first expedition to study Antarctic krill and food fish resources was undertaken in the 1975-76 season by the Federal Research Centre for Fisheries, Hamburg, and the Institute for Marine Science, University of Kiel. It was financed jointly by the Federal Ministries of Research and Technology, and of Food, Agriculture, and Forestry, which provided about \$4.5 million for chartering a commercial trawler, and for scientific equipment and other materials.

A similar amount was provided for last season's expedition which was conducted by the same organisations. The Walther Herwig was used again, and the chartered commercial trawler was the Julius Fock. The area of investigation was the waters from the Bellingshausen Sea west of the Antarctic

Peninsula, the Scotia Sea eastwards as far as the South Sandwich Islands, and the area north-east of South Georgia.

### MARINE RESEARCH

Scientists from Britain, France and Argentina, took part in the first expedition. Last season Australia, which is extending its marine research in Antarctic waters, arranged for marine biologist to join the Walther Herwig. Dr David Tranter, of the Commonwealth Scientific and Industrial Research Organisation's Division of Fisheries, studied the relationship of phyto-plankton to krill distribution.

Between February and April this year South Africa made a feasibility study on the remote sensing of krill to determine whether or not krill swarms could be detected from the air, and whether remote sensing measurements could be used to measure stock sizes directly. The primary study areas were Bransfield Strait and the South Georgia area.

Arranged by the Sea Fisheries Branch of the South African Department of Industries, the project was part of the krill study initiated by BIOMASS (Biological Investigations of Marine Antarctic Systems and Stocks). Scientists from the Sea Fisheries Branch worked from the 2750-tonne South African hydrographic and oceanographic research vessel Protea. The ship's helicopter was equipped with optical equipment for establishing spectral characteristics and horizontal dimensions of any krill swarms observed. Acoustic equipment was used to determine the optimum method of detecting krill, and to describe the extent and stability of swarms in the survey areas.

Early in January this year the Taiwan research ship Hai Kung began a second expedition to study krill resources. She sailed direct from Auckland, New Zealand, and was reported to have called at Lyttelton late in February on her return from Antarctic waters. The Hai Kung's first voyage was marked by the issue of a special philatelic cachet bearing the words: First Exploitation of Krill in Antarctic Ocean.

## JARE-20 PLANS

# Mizuho now winter station on ice sheet

Geological studies in the Yamato Mountains, and continuation of the search for Yamato meteorites which began in 1969, are among the projections in the scientific programme of the 20th Japanese Antarctic Research Expedition (JARE-20) which will be conducted at Syowa Station, and Mizuho Station about 300km to the south-east on the inland ice sheet. The upper atmosphere physics programme will continue on a somewhat reduced scale, and other projects will include the Porex-South programme, solid earth geophysics, and environmental science.

This season's programme will be initiated in November 25 when 42 men of the JARE-20 winter and summer parties leave Tokyo on board the icebreaker Fuji. The leader of the expedition will be Professor Yoshio Yoshida, geomorphologist at the National Institute of Polar Research, who was an exchange scientist with the British Antarctic Survey at Faraday (Argentine Islands) last season, and has worked at Syowa Station and in the McMurdo Sound area. Captain Genki Tanabe will command the Fuji for a second season.

Syowa Station and Mizuho Station will be maintained by the winter party of 32 men under the leadership of Professor Michio Yamazaki. He is a meteorologist from the Japanese Meteorological Agency, visiting research professor at the National Institute of Polar Research, and worked in the Antarctic in 1967-69.

### METEORITE SEARCH

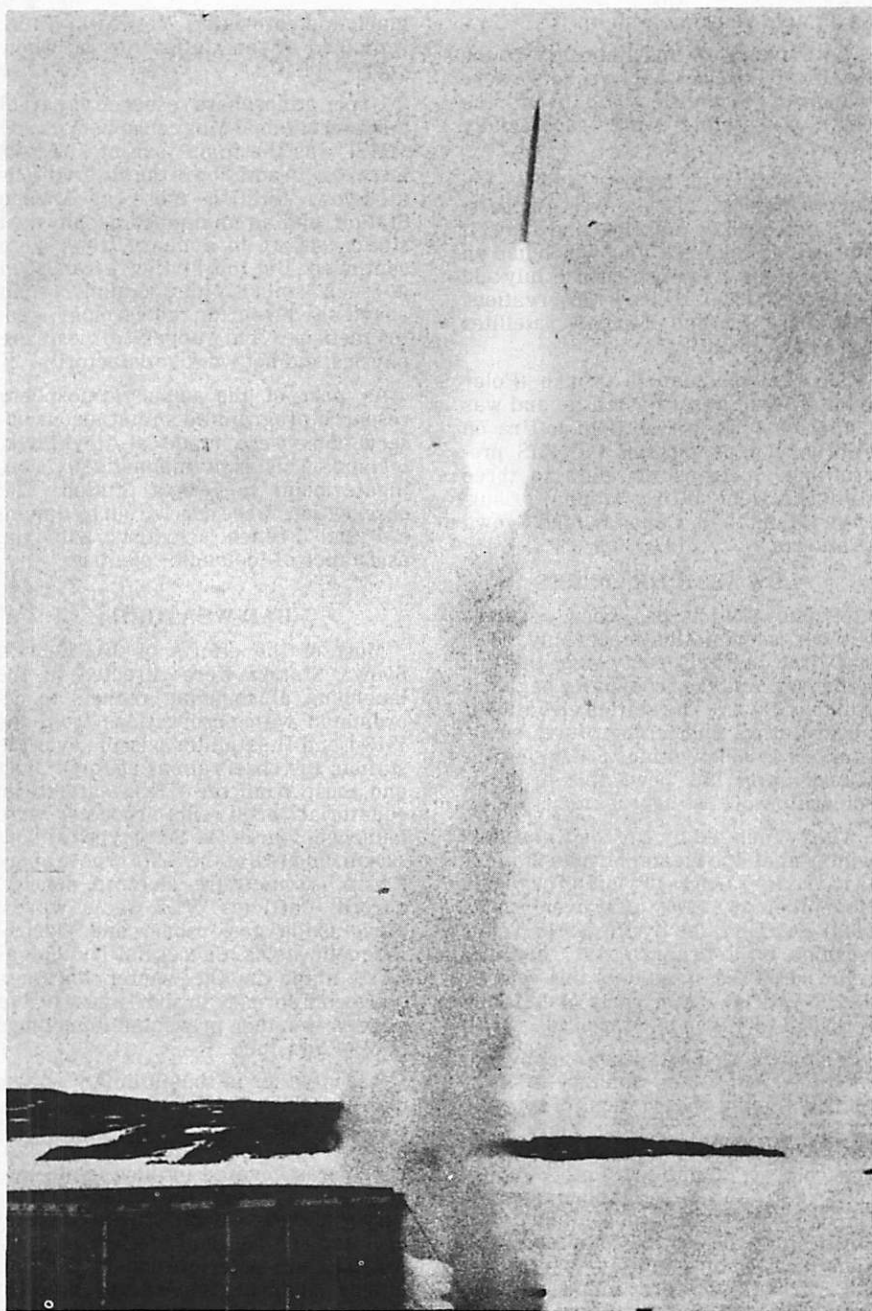
Mizuho Station will be occupied continuously next winter by parties of four scientists sent in rotation from Syowa Station. The station was established originally in the winter of 1970 as Mizuho Camp, and the name was changed officially by JARE Headquarters in March this year. Observations there will be concentrated on the Porex-South programme of air-ice-sea (ice) energy interaction, particularly on research into the radiation balance in the Antarctic ice sheet.

Geologists and geophysicists will return to the Yamato Mountains in the 1979-80 summer to make a geological survey, and to search for more of the Yamato meteorites. The Yamato Mountains are about 300km south of Syowa Station, rise to a height of 200 to 2400m, and comprise seven massifs and several small nunataks separated by outlet glaciers. Yamato meteorites were first found in 1969 on bare ice areas in the southern end and western side of the mountains.

Artificial seismic exploration will be carried out near Syowa Station next year. As an environmental base-line study monitoring of air, water, soils, fauna, and flora around the station will be continued during JARE-20. The marine ecosystem in the pack ice area will be studied during the Fuji's cruise.

### ROCKET FIRING

Thirty men of JARE-19, led by Dr Takeo Hirasawa, an upper atmosphere physicist from the National Institute of Polar Research, have wintered at Syowa and Mizuho Stations this year. They are actively engaged in the third year of the International Magnetospheric Study (IMS) which has been the major programme of JARE since 1976. As part of the programme sounding rockets have been launched from Syowa Station each summer and winter to obtain information on activity in the upper atmosphere. Observation data transmitted from satellites is received



**A sounding rocket launched from Syowa Station takes flight.**

on an auto-tracking system.

On January 28 and February 26 the first two S-210 type rockets were launched. Scientific data from the EXOS-A satellite were successfully received.

Two S-310 type rockets which each have a payload of 40kg were successfully launched on March 27 and June 11, and two of the S-210 type, which had an 11kg payload, were launched in July and August. Simultaneous observations with the ISIS and EXOS-A satellites were carried out.

EXOS-A, nicknamed Kyokko (Polar Lights) is an aurora satellite, and was launched in Japan at Uchi-no-Ura on February 4 as part of the IMS programme. It transmits data to three stations: Uchi-no-Ura (Japan), Churchill (Manitoba), Canada), and Syowa (Antarctica).

### LOW TEMPERATURES

Mizuho Station has been occupied without intermission since May, 1976. The first JARE-19 party went there in February, and the relief party began its stay on May 22. The station elevation is about 2400m, and temperatures sometimes drop below minus 50deg, but the winter party has been able to do its scientific work without a hitch.

Thirty men led by Dr Kou Kunsunoki wintered at Syowa and Mizuho Stations last year. JARE-18 left Tokyo on November 25, 1976, took over Syowa from JARE-17, led by Professor Takeo Yoshino, on February 1, 1977, and was relieved on the same date this year by JARE-19. The winter party of JARE-18 returned to Tokyo on March 20.

Mizuho Station was taken over by four men on JARE-18 on January 29, 1977, and continuing observations of synoptic meteorology, upper atmosphere physics, and glaciology began in May. The station was maintained until January this year, and then handed over to JARE-19. To maintain continuous occupation of the station four men were sent from Syowa Station in rotation. Five traverses were made between January, 1977, and February, 1978, to relieve the parties and deliver cargo. A

glacio-meteorologist, Yoshiyuki Fujii, remained at the station for the whole year.

Upper atmosphere research as part of the International Magnetospheric Study (IMS) was the main task of JARE-18 last year. In addition to the observations at Syowa Station those at Mizuho Station, and an unmanned geophysical station set up in January, 1977, were continued. But this station, established at 69deg 48min S/41deg 35min E, 1470m above sea level, for meteorology, geomagnetism, and upper atmosphere physics, did not work satisfactorily.

As part of the upper atmosphere research programme simultaneous observations were made at Reykjavik, Iceland. This is a magnetically conjugate point to Syowa Station. The observations were carried out by Japanese and French scientists with the assistance of Icelandic scientists.

### BAD WEATHER

Most of the efforts of JARE-18 at Syowa Station were directed to the launching of sounding rockets to co-ordinated with observations from the ISIS-I and II satellites passing over the station, the observations at Reykjavik, and those from the GEOS satellite in equatorial orbit. Six rockets were launched, four of the S-210 type to about 130km, and two of the S-310 type to about 200km, to measure electron density, auroral particles, VLF radio waves, nitric oxide gas, ozone, and electromagnetic fields. Successful launchings were made in the winter darkness between February 10 and August 10, but adverse weather prevented launchings in May and June.

Bad weather in the autumn was also unfavourable for work outside the station. The sea ice around Syowa drifted out from Lutzow-Holm Bay, which was covered by new ice in late July. As a result the ocean bottom survey of the bay, which required travel over the sea ice, had to start in early August, and deterioration in ice conditions stopped the survey late in October. But the surveyor took more than 1100 soundings near Syowa and the



bay.

On January 4 this year the first helicopter of JARE-19 arrived at Syowa from the Fuji, and ended the long isolation of JARE-18. Ice conditions in southern waters early this year were the worst for several seasons, and the Fuji did not reach Syowa until January 17, about two weeks later than planned.

But because of favourable ice conditions in Lutzow-Holm Bay the Fuji was able to anchor close to the station, the first time in eight years that the icebreaker had been able to penetrate the ice round East Ongul Island. The last expedition to do so was JARE-11.

Because of the short distance over the sea ice between the ship and the station helicopter transport was not needed,

and the expedition was able to unload 500 tonnes of large containers and other heavy equipment, which had not been possible for several seasons. Cargo delivery was completed by January 24, and a new earth science laboratory was erected during the month.

Replacement of staff at Syowa and Mizuho Stations was completed on February 1, and the Fuji left East Ongul Island on February 3. Four men from Mizuho were flown to the ship on February 9, and the last of the staff from Syowa on the next day.

With the JARE-18 winter party and the JARE-19 summer team on board the Fuji left the pack ice on February 23. She arrived at Port Louis, Mauritius, on March 9, and from there the JARE-18 winter party flew to Tokyo.

## West Germany may have research station

West Germany, which has sent two fisheries research expeditions to Antarctica — in 1975-76 and 1977-78 — is expected to establish a research station on the Antarctic Continent in the near future. She was admitted to membership of the Scientific Committee for Antarctic Research this year, and indications are that she will obtain consultative membership in the Antarctic Treaty next year.

Early this year West Germany's Minister of Research and Technology, Hans Matthofer, wrote to Chancellor Helmut Schmidt just before he became Minister of Finance, and suggested that the Government should "do like the Americans and Russians" and establish a research station in Antarctica. He said in his letter that the time was long overdue for the Federal Republic, highly industrialised but poor in raw materials, to get a foot in what might turn out to be the world's most important reservoir of raw materials.

West Germany's first expedition to study krill and food fish resources links up with a series of German operations in the field of ocean research in the Antarctic over more than a century. This series began with oceanographic

and deep-sea investigations by the *Gazelle* from 1874 to 1976, and continued with the expedition of the *Valdivia* (1898-99), *Drygalski's* expedition in the *Gauss* (1901-03), *Filchner's* Weddell Sea expedition in the *Deutschland* (1911-12) and those of the *Meteor* (1925-27) and the *Schwabenland* (1938-39). German pre-war whaling operations, particularly those of the mother ship *Jan Wellem*, also included biological studies of whales and krill.

Although West Germany has never had an Antarctic base in the post-war period, her scientists have worked from the bases of other countries, and particularly the United States. This year there have been discussions between West Germany and New Zealand officials on possible future co-operation in Antarctic research.

# Mawson's hut still firm at Cape Denison

Cape Denison, Commonwealth Bay, chosen by Sir Douglas Mawson for the base of his Australasian Antarctic Expedition (1911 - 14) is still the home of the blizzard. Four Australians who worked there last summer to evaluate the structural soundness of Mawson's 66-year-old hut and report on its restoration experienced nearly six weeks of strong winds and drifting snow.

Although few of the 39 days spent at Cape Denison were calm, the Antarctic Division party was able to clear all the ice from the interior of the hut workshop. After tunnelling through about 3m of ice it broke through into an area free of ice in the main living area of the hut and found that almost two-thirds of the room was clear. Because time was short none of the ice in the room was removed.

Led by Mr Rod Ledingham (geologist) Messrs. Guy Macklan (engineer) and Ray Brookes (carpenter) and Dr Jeannie Ledingham (medical officer) arrived off Cape Denison at 4 a.m. on January 18 in the Thala Dan which was making the annual relief voyage to Casey Station. There was a 35-knot wind and drifting snow could be seen near Mawson's hut.

Two hours later the ship's helicopters flew the expedition leader, Mr Tom Petry, assistant director (engineering), Antarctic Division, and Messrs Ledingham, Macklan, and Brookes, ashore to choose a site for a small prefabricated hut to house the party and any subsequent restoration parties. A spot which appeared to be relatively "sheltered" from the wind was found on the west ridge of the boat harbour some 150m from Mawson's hut.

## HUT ERECTED

Building materials, food, fuel, and other equipment were flown ashore during the day, and a group from the 1978 Casey party helped in the erection of the new hut. Construction was completed around midnight, some of those involved having worked straight through for 20 hours. The Cape Denison

party went to bed in their new abode about 2 a.m. on January 19.

Because of bad weather only a few flights were made from the Thala Dan, and men from the ship were unable to spend the second day ashore assisting in various tasks. The ship sailed shortly after noon.

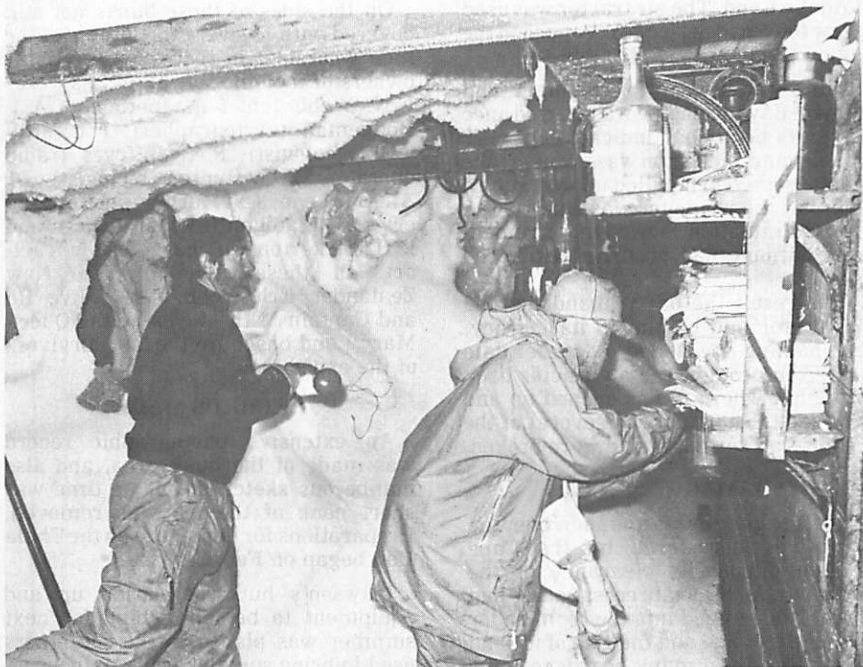
In the next week the summer party concentrated on unpacking stores and making the interior of the new hut livable. Radio aerials were set up for communication with Casey Station, and the French base, Dumont d'Urville, and meteorological equipment was installed between the hut and the boat harbour. Standard three-hourly observations were made on most days from 6 a.m. to midnight.

## BLIZZARD LINE

On January 25 equipment was carried to Mawson's hut and a blizzard line was set up between the old and new huts in preparation for work on January 26. An inspection of the hut timbers revealed that all the external tongue and groove boards were badly weathered, and gaps of varying width allowed sunlight and drift to enter the building.

Excavation began through the western winter entrance of the workshop on January 26. Three doors had to be cleared first before a start could be made on the workshop itself. The second door, between the latrine and the porch was half open, and the door to the workshop was fully open.

To excavate the ice in the interior the party used an ice chisel (a 25.4mm bit in an electrical percussion hammer,



**Members of the Australian Antarctic Division party which worked at Cape Denison, Commonwealth Bay, last summer, inspect the living area of the 66-year-old hut erected for Sir Douglas Mawson's Australasian Antarctic Expedition (1911-14).**

powered from a portable generator), chain saws, and ice axes for softer areas. Ice removed was loaded into a large packing crate fitted with sledge runners, hauled outside and dumped.

Removal of ice from the workshop area continued for three weeks and a half. The party found a number of bottles, rusty tins, a few plates, an old trunk, a claw hammer, old batteries, a dog collar, a hockey stick handle, test tubes, a sharpening stone, a toothbrush, books, old newspapers and scraps of hardware, and timber of various kinds.

Behind the door was a large piece of rotting seal which smelt appallingly until it was chopped free of the ice and removed. In the rafters above the door between the workshop and mess areas the tail plane from the old Vickers air tractor was found in a very rusty, tattered, and bent condition.

This air tractor was Mawson's exper-

Australian Antarctic Division photo  
 iment in the application of mechanical transport to Antarctic land exploration. Vickers Ltd removed the wings from a monoplane and replaced the lower part of the under-carriage with long sledge runners fitted with brakes. Because of the continuous winds the air tractor spent almost the whole of 1912 helpless and drift-bound in the hangar at Cape Denison.

During the winter months F. H. Bickerton, who was in charge of the air tractor, worked on it adapted the mechanism to local requirements. Several successful trips were made on the ice slopes, and the air tractor reached a speed of 20 miles an hour in the face of a wind of 15 miles an hour.

On the afternoon of December 3 Bickerton, L. A. Whetter, the New Zealand doctor, and A. J. Hodgeman (cartographer) set out on what was to be a journey across the coastal highlands

of Adelie Land. The air tractor was used to tow four loaded sledges. Very soon the engine started to give trouble.

Camp was pitched for the night, and the next day the engine was started once more. Its behaviour indicated cylinder trouble, and Bickerton was about to take it to pieces when it pulled up with such a jerk that the propeller was smashed. A brief examination showed that irremediable damage had occurred inside the engine.

As a result the party abandoned the air tractor and continued its journey, man-hauling one sledge. At a later date Bickerton brought the air tractor back to the hut where it was opened up and examined. He found that several of the pistons had seized up and were broken.

#### DAMAGE BY ICE

Damage done by ice and snow over the years was discovered by the Cape Denison during its clearance of the workshop. All the main cross beams had broken and sagged into the room under the weight of ice, and melting of ice and snow had caused many boards to come away from the ceiling. The boards had to be thawed and refixed. But despite the damage the roof was still well-supported.

Once the room was clear all artefacts found were replaced in their original positions, and an extensive photographic record was made. Then on February 20 the party began digging into the main living area of the hut. The two-thirds of the room found to be clear of ice included sleeping bunks in the south-east corner and in Mawson's room.

There were numerous books on the library shelves above the table and on the northern wall of Mawson's room. Items found included bottles, jars, earthenware containers, old boots, a pair of windproof trousers, bins of white flour, unopened tins with labels intact, crates of food still wired, and with AAE written on them, bottles of pure nitric acid for geological and other scientific work, and books and magazines. A chair was stuck on the floor of Mawson's room, and a number of tins was iced in up on his shelves.

On the sides of those bunks not still covered with ice were the initials of the men who slept in them. The probable owners of the nine sets of initials were: E.N. Webb (chief magnetician), A.J. Hodgeman (cartographer), F.L. Stillwell (geologist), S.N. Jeffryes (radio operator), J.G. Hunter (biologist), Dr A.L. McLean, J.F. Hurley (photographer), C.T. Madigan (meteorologist), and F.H. Bickerton (in charge of air tractor). Of these men only the New Zealander, Eric Webb, is still alive. He and Captain M.H. Moyes, of the Queen Mary Land base, are the last survivors of the expedition.

#### RECORDS MADE

An extensive photographic record was made of the bunk area, and also numerous sketches, but as time was short none of the ice was removed. Preparations for departure on the Thala Dan began on February 22.

Mawson's hut was closed up and equipment to be left behind for next summer was placed in the seatainers used to bring supplies from Melbourne. Several books and magazines were taken from the hut to be worked on in Australia in case a major find was made by a later restoration party. A visitors' book was made by sticking notes found in the magnetograph hut into a book.

Granholt (meaning Grand Harbour) was the name bestowed on the new hut by the party in recognition of the assistance given by Captain Peter Granholt, master of the Thala Dan. Mr Brookes carved two plaques, one for the hut bearing the inscription "Granholt Hut '78", and the other for presentation to the Thala Dan with "Home of the Blizzard" on it.

On a voyage to Dumont d'Urville under charter to Expeditions Polaires Francaises the Thala Dan arrived during the afternoon of February 25, but with winds of around 60 knots and poor visibility there was no chance of picking up the party. She was thought to have departed to Dumont d'Urville, but late in the evening, during a lull in the wind, her lights could be seen behind the McKellar Islets.



Signals were sent to the ship by opening and closing the cold porch door of the new hut with the interior light on. Then plans were made by radio for the ship's boat to come ashore at 4 a.m. on February 26 provided the weather remained suitable. The weather held, but because of the heavy chop only one trip could be made, and much of the equipment intended for return to Australia had to be hurriedly returned to the new hut.

Mr Ledingham and his companions had a rough journey back to the Thala Dan, which was lying some 2½ km to the north-west. The Little Thala kept dipping and diving, and the occupants were

drenched by freezing sea spray. Finally the Thala Dan steamed up and positioned herself to protect the boat from the swell and the wind. Then, after the Little Thala was lifted on board, the ship left Commonwealth Bay to the wind for another year.

[This account of the work done at Cape Denison last summer is a summary of a longer article by Ray Brookes in "Aurora", the ANARE Club's journal. The editor of "Antarctic" is grateful to the editor of "Aurora" and Mr Brookes, the ANARE Club representative in the Antarctic Division party, for the opportunity to publish the report.]

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## THE READER WRITES

### Sidelights of Antarctic Research

Sir, — The legend that McMurdo Sound had no human visitors for 30 years after the departure of the survivors of Shackleton's Ross Sea Shore Party has persisted too long, and "James Pigg" ("Antarctic", June 1978) is right to give us the facts. But it is surprising that the legend has been accepted for so long.

All the basic facts about the Norwegian visit to McMurdo Sound early in 1924 have been known for 46 years. And most of the answers to the questions asked by "James Pigg" are actually in New Zealand, buried in the National Archives.

In "The Conquest of the South Pole", the Antarctic historian, J. Gordon Hayes, devoted a page to two visits to McMurdo Sound by the whale chaser Star I. His book was published in 1932. A in the Star I on her second visit was Captain G.S. Hooper, who joined the factory ship Sir James Clark Ross in his capacity as the New Zealand Administrator of the Ross Dependency.

On her first cruise from Discovery Inlet in January the Star I visited Franklin Island and then McMurdo Sound which was full of ice. A longer cruise began on January 27. A landing was attempted without success at Cape Crozier, but evidence of the Emperor

penguin rookery was seen.

J. Gordon Hayes says that McMurdo Sound was entered as far as Cape Royds where pack ice prevented further progress. Shackleton's hut was not seen, but the Adelie penguin rookery was sighted. No steam appeared above the crater of Mt. Erebus.

After passing Beaufort and Franklin Islands the Star I set a course for Wood Bay. Coulman Island was rounded, and Tucker Inlet as well as Moubray Bay were found full of ice.

Star I entered Robertson Bay, and the huts erected at Cape Adare by Borchgrevink in 1899 and Scott's Northern Party in 1911 were seen. But a heavy swell prevented a landing, and on February 2 the Star I turned south, heading back to Discovery Inlet.

Captain Hooper, first of the Administrators of the Ross Dependency, made reports to the Marine Department on his Antarctic voyages with the Ross Sea whaling fleet. They are unlikely to add much to the facts given by J. Gordon Hayes; they might give a fuller description of an historic cruise.

Yours etc.  
MOBY DICK

# Norway's weather station on Bouvet Island

Norwegian scientists will set up a manned weather station this summer on Bouvet Island, perhaps the most isolated island or piece of land in the world. Situated at 54deg 25min S/3deg 24min E in the South the island has been a Norwegian possession since 1927, and is an active volcanic area, the last eruption occurring as late as 1957.

Establishment of the weather station is part of the programme of Norway's second independent scientific expedition since 1960, which will also work in Queen Maud Land and the Weddell Sea this season. The first expedition, organised by the Norwegian Polar Institute and led by Dr Olav Orheim, went south in the 1976-77 season. No expedition was sent last season as reported in "Antarctic", March, 1978.

This season's expedition will have a strength of 48 scientists and support staff. Scientists will be drawn from the Norwegian Polar Institute and other scientific organisations, and the universities. Half the group will leave Cape Town in December to set up the Bouvet Island weather station and study the flora and fauna of the barren, volcanic island. The 24 men will remain on the island for two months.

A chartered ice-strengthened sealer, the Polarsirkel, used on the first expedition, will take the first group to Bouvet Island, and then will return to Cape Town to pick up the second group which will work on the Weddell Sea coast of Queen Maud Land, and also further south. This group will continue the land-based research initiated by the 1976-77 expedition, and will carry out a programme of oceanography, geophysics, and marine biology from the Polarsirkel.

In February last year a landing was made on Bouvet Island from the Polarsirkel when she was on her way back from Queen Maud Land. It was the first landing by a Norwegian polar team since 1931. A navigation beacon was

erected to help with navigation systems linked with South Africa, and an automatic weather station was installed in preparation for the First GARP Global Experiment (FGGE), an international project which begins this summer to determine the facilities needed for the Global Atmospheric Research Programme (GARP).

As part of its contribution to FGGE Norway will operate the weather station on Bouvet Island. Because of its isolated position — a circle with a 1600km radius drawn round it would not include any other island or land mass — Bouvet Island has attracted the interest of meteorologists of several nations for the last 60 years. The Norwegian scientists will record meteorological observations, using radio-sondes, up to a height of 30km, during January and February next year.

Twenty-two research scientists, including an Argentine guest scientist, took part in the first Norwegian expedition which spent more than two months in Queen Maud Land and the Weddell Sea. Nine men worked in the land-based programme, and 13, including the Argentine scientist, worked on board the Polarsirkel.

Five men established a base camp (Camp Norway) close to the outer edge of the 200km thick ice barrier on the Weddell Sea coast of Queen Maud Land. The other four in the land party worked 200km further south in the Westfjelle. Three geologists worked on the geology and paleomagnetism of the Vestfjella, and carried out stratigraphic work to establish possible links with the rest of Gondwanaland.

# Protection of Antarctic seal stocks

After almost six years a convention to protect Antarctic seals from over-exploitation by any future commercial sealing, and to provide scientific data on which to base harvesting, is now in force. In 1972 the 12 Antarctic Treaty nations concluded and signed the Convention for the Conservation of Antarctic Seals, but it had to be ratified by seven of the signatories before it could come into force.

In February this year the Soviet Union and Belgium became the sixth and seventh nations respectively to ratify the convention, and it came into force on March 11 after the seventh nation had informed the British Government (which acts as the depository for notification of a nation's acceptance) of the ratification.

Australia and New Zealand are among the five nations still to ratify the convention, but both are expected to do so this year. The convention is listed in the schedule to the Australian National Parks and Wildlife Act, 1975, and regulations can be drafted for ratification. New Zealand will follow suit when its Marine Mammals Protection Act, which bans the taking or killing of marine mammals such as whales and seals, comes into force.

All the area south of 60deg is covered by the convention, although there is provision for reporting catches made in pack ice north of that parallel. Within that region there are three small areas where catching of any species of seal is totally banned because they are either seal breeding regions or the site of long-term scientific research. These are around the South Orkney Islands, and in the north-west and south-west Ross Sea.

## CATCH LIMITS

Catch limits have been assigned to three of the six species of seal referred to in the convention for any one year. These limits can be varied according to how well the species is faring under exploitation. The species and the present quotas are: Crabeater (175,000), Leopard (12,000), and Weddell (5,000).

To protect adult Weddell breeding stock when it is concentrated and vulnerable, the taking of individuals one year or older is forbidden, except during February.

Three species of seal — Southern Elephant, Ross, and fur seals — are totally protected. They may not be taken except for scientific investigation, museum purposes or as indispensable food for men or dogs.

Catching of seals is permissible under the guidelines of the convention only in the sealing season. This runs for six months from September 1 to the end of February. In addition Antarctica is divided into six sectors corresponding with those used by the whaling industry. For each sealing season one of these sectors is totally closed to sealing, but the following season that sector re-opens, and the next (in numerical sequence) is closed, and so on. In the 1978-79 season, the first that the convention operates, Region 4 between 70deg and 130deg East is the closed sector.

Provision is made in the convention for consultations between the contracting parties at any time after commercial sealing begins. This is to establish a system to control exploitation, including an observer system to ensure that each nation complies with the regulations.

There is provision also for the establishment of a sealing commission, and scientific advisory bodies. Scientific programmes and studies can be initiated to govern exploitation and thus ensure that over-exploitation does not occur.

Until such bodies are established, the Scientific Committee on Antarctic Research (SCAR), through its group of specialists on seals in the working group on biology, has the responsibility to monitor any catching or exploitation. It will also encourage the exchange of scientific data, and recommend programmes for scientific research and collection of biological data.

At present contracting parties provide each other and SCAR each year with lists for the six sectors of the number of adult seals and pups of each species taken each month, and if

applicable, details of the vessels engaged in such work. In addition, details of the age, sex, and reproductive condition of seals taken are to be provided to SCAR.

Once a sealing industry has started such reports will be forwarded at intervals of less than one week to SCAR, which will collate and monitor exploitation data. Meetings can be arranged if SCAR reports that exploitation of any species is having a "significantly harmful effect on total stocks or the ecological system of a particular locality.

## Poland to operate two research stations

Poland, which established a permanent Antarctic research station in the South Shetlands on King George Island in the 1976-77 season, and is now a consultative member of the Antarctic Treaty, will send a small expedition to work this summer at a station which it first occupied 20 years ago. The permanent station is Arctowski, named after Henryk Arctowski, one of two Polish scientists with the Belgica expedition of 1897-99, and the summer station is Dobrowolski, named after Anton Dobrowolski, the other Pole.

Dobrowolski Station was originally Oasis Station, a sub-station near the western end of Knox Coast 360km from Mirny. It was established by the Soviet Union in 1956, and renamed when it was handed over to the Poles in the 1958-59 season. A Polish party worked there for two weeks in January, 1959, but the station was not occupied during the winter or in the next season.

Until January, 1966, Dobrowolski was mothballed. Then, after an inspection by a Soviet party from Mirny at the request of the Polish Academy of Sciences, it was closed permanently. Members of the Australian National Antarctic Research Expeditions who called at Dobrowolski early in March, 1977, found the station in excellent condition.

Seven scientists and 15 support staff will work at Dobrowolski Station this season, but it will not be occupied next winter. The expedition is expected to travel south in the motor-ship *Zabrze*.

Air support will be provided by two small Mi-2 helicopters.

Dobrowolski Station was occupied for the first winter by seven scientists and 19 support staff. It is located at Point Thomas on the south side of the entrance to Ezcurra Inlet in Admiralty Bay, and is in 62deg 10min S/58deg 28min W. The scientific programme, carried out with the aid of three boats and three amphibian craft, included biological, ichthyological, and climatological studies, and a study of the geomorphology and geography of the Arctowski region.

This summer 49 scientists and 92 support staff will take part in the Polish expedition to Arctowski Station, and 10 scientists and 19 support staff will remain there next winter. The expedition, which will include scientists from Argentina and the Soviet Union, will be transported to King George Island in the motor-ship *Antoni Garnuszewski*. It will be supported by two Mi-2 helicopters which will remain there for the winter.



## Winter appendicitis operations

Medical officers at two Australian stations in Antarctica have both had to perform operations for appendicitis this winter. Dr Noel Hutchins operated on a diesel mechanic, Mr Graeme Russel, at Casey Station on May 17, and Dr John Birss, medical officer at Mawson Station, performed a similar operation on a plumber, Mr Ian Johnston, on July 24.

Although there are medical officers at the three Australian stations, Mawson, Casey, and Davis, all members of the winter parties receive specialised medical training at the Royal Melbourne Hospital before they go south. Dr Hutchins was assisted by the cook, Mr Jim Vallance, a radio operator, Mr Rod Parsons, and a physicist, Mr Ray Morris. Members of the Mawson Party who assisted Dr Birss were the cook, Mr Ricky Schmitter, a meteorological observer, Mr Bert Berzins, and a geophysicist, Mr Josko Petkovic.

Since nations set up permanent stations on the continent medical emergencies have occurred on most national expeditions to the Antarctic. Some cases of appendicitis have been treated either by operation or medication; others have been evacuated by air.

Lieutenant Vernon Houk, medical officer at the Amundsen-Scott South Pole Station in the winter of 1958 had to deal with a case of acute appendicitis in a member of the party. He was unable to operate because of problems of altitude, frozen anaesthetic agents, lack of trained help, and total isolation. But non-surgical treatment by medication was successful.

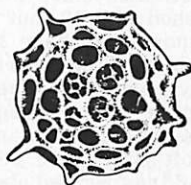
Similar problems confronted Leonid Rogozov, the medical officer at the Soviet station, Novolazarevskaya, in 1961. Because a severe storm made it impossible for an aircraft to fly from Mirny Rogozov was forced to operate on himself for acute appendicitis. He was assisted by a meteorologist and a mechanic who held the retractors and a mirror for the operation, which took two hours.

One of the first recorded operations for acute appendicitis was performed by a New Zealand doctor at Little America in 1934. Dr Louis H. Potaka, an Otago University graduate, who joined Byrd's second expedition (1933-35) when Dr G.O. Shirey could not remain with the shore party because of his health, had to operate on an aerial photographer, J.A. Pelter, only a fortnight after his arrival in Little America.

Dr Potaka's operating theatre was the radio shack, which was cleaner and more comfortable than the other camp buildings. An operating table was improvised by laying stretchers across a half-built table without a top, and a fire was built to keep the room warm during the operation. When the temperature was about 80deg Fahrenheit the ashes of the fire had to be raked out and removed because the anaesthetic administered by the hospital orderly, James Sterrett, a medical student with several years' training, was ether.

As Dr Potaka called for instruments they were handed to him by the expedition biologist, Dr. Jack Perkins, from a small table normally used as a stand for the radio broadcasts. Wash basins were spread out on top of the small collapsible organ used in the broadcasts. Although cracks in the radio shack had been plugged and the ventilators sealed, the temperature dropped steadily, and everyone was shivering by the time the operating ended, and the fire could be started again.

References: D.J. Lugg, M.D. (1975), *Antarctic Medicine, 1777-1975*, The Medical Journal of Australia, Part I, August 23, 1975, Part II, August 30, 1975. Richard Evelyn Ryrd, *Discovery, The Story of the Second Byrd Antarctic Expedition*, Pages 147-150.



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# ANTARCTIC BOOKSHELF



## SNOW DOGS

by  
Neville Peat

Whitcoulls, Christchurch, New Zealand. 112pp. Illustrations and 10 black and white drawings by Maurice Conly. \$6.95.

Huskies have been part of Antarctic life and exploration since 1899 when Borchgrevink took 90 dogs from Greenland and Siberia to Cape Adare. Their contribution to the Heroic Age of exploration is part of Antarctic history, and despite the coming of aircraft, snocats, and motor toboggans, to aid the new age of scientific research, they still retain a place in polar transport.

Since Borchgrevink almost every Antarctic expedition has relied on huskies as a sole or supplementary means of transport and every explorer has written about them. Some have said more than others, but, surprisingly, the dogs themselves and their hard, extraordinary life, have not achieved the place in Antarctic literature they deserve.

In the last 40 years only two men who have lived and worked with sledge dogs in Antarctica have tried to tell their story adequately. Stuart Paine, one of Byrd's dog drivers, described the life of a great husky, Jack the Giant Killer, in "The Long Whip", a classic of its kind, published as far back as 1937. And 20 years later Robert Dovers, son of one of Mawson's men, wrote "Huskies", a moving account of three teams of huskies in his care during a year he spent with a French expedition in Adelie Land.

New Zealand has used huskies in its Antarctic activities since Scott Base was established in 1957, but over the years the snow dogs have been displaced from most of the tasks they once performed by the tin dogs — the efficient but unattractive motor toboggans. In recent years the only permanent residents of Scott Base have been more photographed than written about.

Fortunately, Neville Peat, a New Zealand journalist and photographer, who had two summers as an information office at Scott Base, has now given us the story of New Zealand's huskies, and paid well-deserved tribute to their tremendous service and spirit. "Snow Dogs" is an authoritative, highly readable account of the huskies — their breeding, behaviour, upbringing, and training for the work they do.

Neville Peat's lively text covers the part played by huskies in the Heroic Age of exploration, their role in the modern era — only Britain, Australia and New Zealand, still use huskies at their bases — and the future of these dogs as the nature of man's work changes, and advances in mechanised transport threaten to make them redundant. He says history will show that scientists came to grips with the mysteries of Antarctic through the husky's strong body, sturdy legs, and stalwart spirit.

Huskies are always photogenic in their polar environment, "Snow Dogs" has more than 60 photographs of them in every situation. In 1977 Neville Peat wrote the text for "Ice On My Palette", a collection of Antarctic paintings by the New Zealand artist, Maurice Conly. "Snow Dogs" continues the collaboration with 10 of Maurice Conly's black and white drawings.

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Residents of the United Kingdom can order "Snow Dogs" from the New Zealand Book Shop, 26 Royal Opera Arcade, London, SWTY 4UY. Australian residents can order from Whitcombe and Tombs Pty. Ltd., 159 Victoria Road, Marrickville, New South Wales. All other orders should be directed to Whitcoulls Ltd., Private Bag, Christchurch, New Zealand.

# ANTARCTIC

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

Yearly subscription NZ\$6.00, Overseas NZ\$7.00, includes postage (air mail postage extra), single copies \$2.00. Details of back issues available, may be obtained from the Secretary, New Zealand Antarctic Society (Inc.), P.O. Box 1223, Christchurch, New Zealand. Back issues more than five years old are available on request.

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

## NEW ZEALAND ANTARCTIC SOCIETY (INC.)

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

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

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

You are invited to become a member, South Island residents should write to the Canterbury secretary, North Islanders should write to the Wellington secretary, and overseas residents to the secretary of the New Zealand Society. For addresses, see below. The yearly membership fee is NZ\$4.00 (or equivalent local currency). Membership fee, overseas and local, including "Antarctic", NZ\$10.00.

New Zealand Secretary

P.O. Box 1223, Christchurch

### Branch Secretaries

Canterbury: P.O. Box 404, Christchurch.

Wellington: P.O. Box 2110, Wellington.

# THE RAVEN

## NEW YORK AND LONDON: THE SOCIETY OF RAVEN

The New York Society of Raven was founded in 1842 by a group of young men who were interested in the study of the raven. The Society was organized to promote the study of the raven and to publish a journal devoted to the subject. The journal, titled "The Raven," was first published in 1843 and has since become a leading authority on the subject. The Society has a long and distinguished history and has been instrumental in the advancement of the study of the raven.

