

ANTARCTIC

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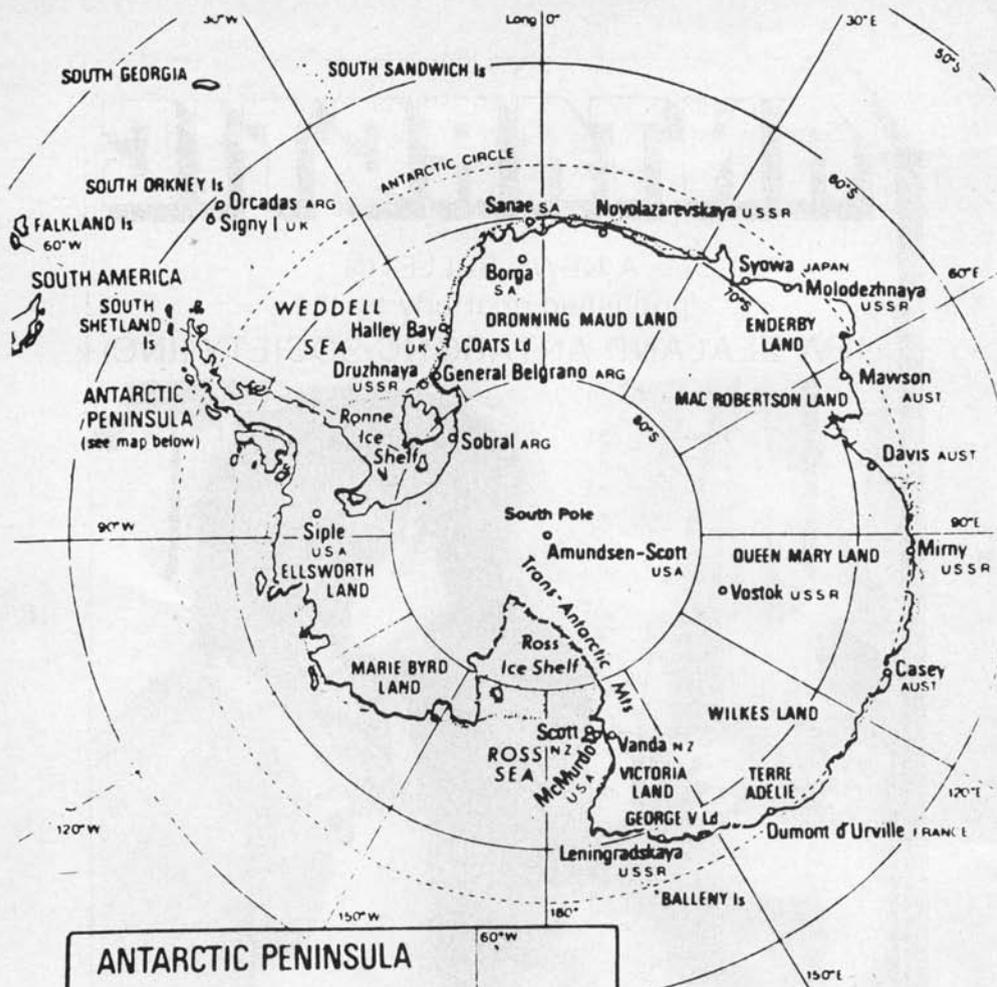
Bjorn, a young Scott Base husky born last December, gazes pensively at his winter dog handler, Bill Eaton. This summer he will join his working elders.

Antarctic Division photo

Vol. 10, No. 3

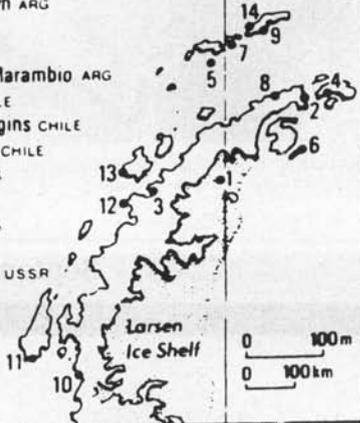
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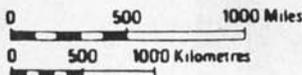


ANTARCTIC PENINSULA

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



ANTARCTICA



ABBREVIATIONS

ARG ARGENTINA
AUST AUSTRALIA

SA SOUTH AFRICA
UK UNITED KINGDOM
USA UNITED STATES OF AMERICA
USSR UNION OF SOVIET SOCIALIST
REPUBLICS

ANTARCTIC

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NEW ZEALAND PLANS FOR SEASON

New Zealand's Antarctic research programme for 1983-84 includes the establishment of a base camp and other scientific and logistic preparations for the first stage of the long-term offshore drilling project Cenozoic Investigations in the Ross Sea (CIROS). Next year two holes will be drilled into the seabed of McMurdo Sound at Butter Point, New Harbour.

A study of Hallett Station, the joint United States-New Zealand station established in 1957 and closed early in 1973, will be made to decide whether it can be used again as a scientific base. Mr R. B. Thomson, director of the Antarctic Division, who was station scientific leader at Hallett in 1960, will lead a joint New Zealand-United States group there in January, and a small team will remain to do some preliminary tidying up and make another report on the feasibility of re-opening the station.

New Zealanders will take part in or support projects with United States and Japanese scientists in the dry valleys and on Mt. Erebus. Five Japanese geochemists will work in the New Zealand programme and guest scientists from the People's Republic of China and Brazil, and a logistics expert from Uruguay have been invited to participate. Professor Yoshime Ikeda, of the Institute of Oceanography, University of Sao Paulo, is the Brazilian visitor, and one of the two Chinese representatives is a woman geologist, Xie Youyu. The other Chinese visitor is a power plant engineer.

This season the New Zealand programme will call on up to 200 scientists and support staff. Most of the projects will be undertaken in the McMurdo Sound/dry valley region, and on Ross Island. But there will be an aerial survey of Adelie and Emperor penguin colonies along the North Victoria Land coastline from McMurdo Sound, and a remote geological project in the Ohio Range of the Horlick Mountains 550 km from the South Pole. New Zealand geophysicists will take part in seismic cruises in the Ross Sea and off the coast of Wilkes Land aboard the United States Geological Survey's research vessel Samuel P. Lee.

All the continuous long-term seismic, geomagnetic, ionospheric, and meteorological programmes will be maintained at Scott Base. The Meteorological Service intends to expand its programme at the base from 1984-85 onwards and a technical officer will go south this summer to prepare for the installation of specialised instrumentation.

Scientists from five universities will undertake a number of field research projects listed elsewhere in this issue. Men and women from the Antarctic Division, Ministry of Works and Development, Geological Survey, Geophysics Division, Soil Bureau, Physics and Engineering Laboratory, Meteorological Service, Lands and Survey Department, Ecology Division, Marine and Freshwater Science Division, and the Commission for the Environment will work on a wide range of projects. An Army construction team will continue the Scott Base rebuilding programme, and the Post Office riggers will check aerial installations.

Logistic preparations for the first year's drilling next season will be the main objective in the long-term offshore drilling project Cenozoic Investigations in the Ross Sea (CIROS) this summer. Equipment and building materials

stored at Scott Base last season will be moved to Butter Point across the sea ice of McMurdo Sound, and a camp will be erected there ready for occupation in September next year.

CIROS, which is co-ordinated by the Antarctic Division and Victoria University of Wellington, is a geological drilling programme spanning two seasons. Next summer two holes will be drilled off Butter Point in New Harbour, and in 1985-86 two more holes are proposed off Cape Roberts near Granite Harbour.

To recover a stratigraphic record of the sediments in McMurdo Sound from the present day through to pre-glacial times, believed to be in the Cenozoic era 60 million years ago, is the main purpose of CIROS. The objective is to drill through the seabed to a depth between 280m and 500m. Study of the sub-bottom cores is expected to throw light on the development of the Antarctic ice-sheet and the rise of the Transantarctic Mountains. Scientific results will also be helpful in assessing hydrocarbons in the McMurdo Sound area although that is not the purpose of CIROS.

Preparations for CIROS this season began late last month when John Sandys, the Antarctic Division camp construction overseer and Gerald Taylor, an assistant maintenance officer, flew south. They will be followed next month by nine more members of the logistic team: Murray Wilson, Keith Whitehead (AMOs), Colin Poole, Larry Weller (drillers), three Geophysics Division drillers, Leon Olliver, Paul Carroll, and Dave Clemence, and two New Zealand Army drivers, Chris Mitchell and John Flintoft. In November Jack Hoffman, the Geophysics Division's drilling superintendent, will join the team.

Every fortnight from this month during the summer season measurements will be made of the sea ice thickness off Cape Armitage, Butter Point, New Harbour, and Marble Point. Results of the measurements which will be made by John Sandys and the two Scott Base dog handlers, Bill Eaton (1982-83) and Alasdair Roy (1983-84) will have a bearing on the use of tractor trains and other

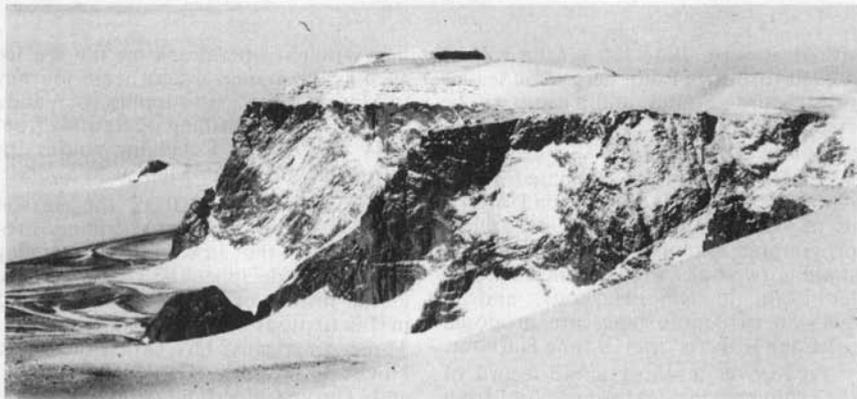
heavy-weight operations on the sea ice such as the annual tractor train journey to Marble Point with supplies for Vanda Station, CIROS drilling operations from 1984 to 1986, and sledging routes for scientists working in McMurdo Sound.

Complementing CIROS this season will be an international drilling programme in the Lower Taylor Valley designed to decipher the Late Cenozoic glacial history of the valley as reflected in fluctuations of the Ross Ice Sheet. Three Americans, Drs Don Elston and Hugh Reick (U.S. Geological Survey) and Gary Calderone, and Dr Paul Robinson (N.Z. Geological Survey) will work with four New Zealand drillers, John Hay and Stephen Pilcher (Antarctic Division), Bruce Morris and Warwick Potter (VUW) on a combination of geological mapping and drilling with detailed paleomagnetic, paleontological, and geochemical analyses to determine the age, environment of deposition, and the source of glacial drift sequences in the Lower Taylor Valley.

Last season New Zealand drillers using Antarctic Division equipment drilled a series of 60m holes between New Harbour and Lake Bonney. A major part of the field work this season will be to drill six holes between 40 and 80 metres in the Lower Taylor Valley. Two will be in the 1982-83 drilling area and four near Lake Fryxell. It is hoped that at least two holes will penetrate beneath the sediments deposited by the Ross Ice Sheet onto the older fiord sediments beneath.

This project will also tie into studies undertaken in the area by the University of Maine, Ohio State University, and geochemical investigations by Waikato University, and the Japanese Polar Research Association. Dr Chris Henty, of the Waikato Antarctic research unit, and two of his geochemistry students will make detailed studies of exposed sediments in the Miers and Taylor Valleys in association with the international programme.

Once again one of the most remote projects in the programme — a geological expedition to the Ohio Range of the Horlick Mountains 1422km from



Ohio Range country: Flat-lying Beacon sediments can be seen at the top of 600m granite cliffs on Darling Ridge in the Ohio Range of the Horlick Mountains where a Canterbury Museum geological expedition led by Margaret Bradshaw will work this season. High granite cliffs like these photographed on the first museum expedition in 1979-80 are characteristic of the north-facing Ohio Range escarpment.

Photo: Margaret Bradshaw

Scott Base — will be led by Margaret Bradshaw, the Canterbury Museum's geologist. In the 1979-80 season she and two United States geologists and an Antarctic Division field leader spent 50 days sledging in the area, concentrating on the Lower Devonian Horlick Formation but also studying the Buckeye Tillite, and Permian coal measures.

This season Margaret Bradshaw, two other geologists, Jane Newman (University of Canterbury) and Jonathan Aitchison (Antarctic Division) and Bill Atkinson, an Antarctic Division field leader and toboggan mechanic, will spend 10 weeks between November and January in the remote Ohio Range which lies at the southern end of the Transantarctic Mountains at 84 deg 45 min S between 111 deg and 117 deg W, and rises to 3048m above the Polar Plateau. The United States Navy Hercules aircraft which will put the team in will have to land on the plateau at an altitude of 2590m.

On the second visit to the area where United States scientists worked in the 1960-61 and 1961-62 seasons the museum expedition will amplify work on the Devonian sequence, study the unusually thick (750m) coal-bearing Permian sequence, and follow up discoveries in the Buckeye Tillite with a

view to explaining its origin, its great thickness (300m) and effect on local ice sheet movement. A detailed sedimentological study of the Mt Glossopteris Formation is also planned.

When the first party climbed Mt Glossopteris (2865m) it collected some Permian Glossopteris (fernlike) leaves. Fossil fresh-water bivalves also collected were the first Permian bivalve fossils ever found in the Transantarctic Mountains.

Between the Lackey Ridge, and the Darling Ridge (2350m) of the Ohio Range there is a large patch of moraine-covered ice. On its way to Treves Butte (2100m) which was found to be inaccessible without helicopter support in 1979-80, the expedition plans to search for meteorites ablated out of old ice.

Among the scientists of several nations who will take part in the United States Geological Survey's international geological/geophysical survey between New Zealand and Antarctica aboard the research vessel Samuel P. Lee will be Dr Fred Davey, of the Geophysics Division. He will join one of the two seismic cruises to the Ross Sea and the Wilkes Land coast area. Mr Bryan Davy, also of the Geophysics Division, may join the other cruise.

On the first leg of the survey the Samuel P. Lee will leave Lyttelton on December 28. She will cruise as close as possible to the ice off Wilkes Land and is expected at McMurdo Station on January 29. The second cruise in the Ross Sea area will begin from McMurdo Station on February 2 and end at Lyttelton on March 2.

New Zealand's main base on the continent, Vanda Station, 130 km west of Scott Base in the Wright Valley, will be operated all summer. Until the end of January the leader, Malcolm MacFarlane and his staff of three will support field parties working in the dry valleys. They will also continue a programme of daily meteorological observations, record solar radiation, and measure wind, temperature and pressure variations above the valley floor.

In addition to support for New Zealand and United States field parties in the dry valleys or on the edge of the Polar Plateau Vanda will support the hydrology and glaciology programme in the Taylor, Wright, and Victoria Valleys by Jeff Robertson, of the Ministry of Works and Development, assisted by Bruce Mason, an Antarctic Division field assistant. This team will continue the monitoring programme that has documented for the last 10 years long and short term climatic variations in the dry valleys.

Nine enclosed dry valley lakes (Vida, Vanda, House, Joyce, Bonney, Henderson, Hoare, Fryxell, and Don Juan Pond) will be monitored as part of the short-term studies. Temporary flumes and thermographs will be installed in the Meserve and Bartley melt water streams to study the relationship between melt water runoff and summer climate.

In the long-term studies mass balance measurements will be made on the Heimdall Glacier and the Wright Lower Glacier. In addition this year the stability of alpine glaciers will be investigated by a study of the snout of the Upper Victoria Glacier.

During the last three seasons the New Zealand Geological Survey has installed and monitored a network of survey

markers round the summit caldera of Mt Erebus. The purpose has been to detect the nature and rate of deformation in the summit region with the aim of establishing a correlation between inflation/deflation and variations of the activity in the volcano's lava lake.

Between late November and early December Steve Currie, a Ministry of Works and Development surveyor, and Brad Scott, of the Geological Survey, will continue the deformation study. An Antarctic Division field assistant from the snowcraft and survival team will be responsible for safety aspects.

New Zealand is still represented in the International Mt Erebus Seismic Study (IMESS), the United States-New Zealand-Japanese project to investigate the seismicity and vulcanology of Erebus, but will not take part in work on the mountain this season. But Scott Base laboratory staff will still service the equipment which records signals from the network of seismograph stations set up on Mts Erebus and Terror. IMESS scientists from the United States and Japan will install two more permanent stations this summer, and eight to nine temporary stations which will record information for 20 to 25 days.

New Zealand's Commissioner for the Environment (Mr K. W. Piddington) plans to gain first-hand knowledge of Antarctica's environment this season. He will accompany two scientist who will spend two weeks in November on a pilot study of icebergs in the McMurdo Sound — Ross Island area. This project has been partially funded by the commission.

Three scientists from the Soil Bureau, Dr Tom Speir, Jan Heine and Valerie Orchard, and Hans Konlechner, a University of Canterbury botany student, will work at Cape Bird and in the Wright Valley. The soil scientists will build on research into organic matter in the soils of penguin rookeries which was conducted in the 1981-82 season.

On site analyses will be made of the biological and biochemical processes in

guano-influenced soil material. The results will be compared with relatively sterile soils in the Wright Valley. Other work will include a soil survey of Cape Bird, soil temperature and water content measurements, and geomorphological studies of rates and causes of slope movement, and permafrost effects.

Because of their environmental extremes and diverse productivity the streams of the McMurdo Sound area are ideal for a comparative study of stream ecological processes. This study will be made by three scientists from the Marine and Freshwater Science Division, DSIR.

Dr Warwick Vincent, his wife Connie, and Dr Clive Howard-Williams, will investigate four chemically and biologically distinct stream systems, the Onyx River in the Wright Valley, the Fryxell Stream in the Taylor Valley, the streams of Lake Miers, and the streams of Cape Bird/Harrison Bluff. They will also measure aspects of nitrogen cycling and controlling factors for primary production in Lake Miers.

To date little iceberg research has been conducted in the Ross Sea. This season Dr J.R. Keys, of the Commission for the Environment, and Dr M. McDonnell, of the Physics and Engineering Laboratory, will carry out a study in McMurdo Sound to identify the sources of icebergs off the Victoria Land coast, to determine the mechanisms by which these bergs decay, and to obtain sedimentological information on any rock material that they carry.

This season the event is a feasibility *pilot* study directed to the development of a research programme to measure physical characteristics, sample sediments, and monitor drift tracks of bergs in the McMurdo Sound/Ross Island region. This basic data will be used to interpret satellite imagery and associated technology being developed by PEL.

A strain meter developed at the Scott Polar Research Institute will be used by Physics and Engineering Laboratory scientists to measure flexural waves generated by vehicles travelling on McMurdo Sound sea ice. Dr Bill Robinson,

Arnold Heine, and Tim Haskell, will also measure stress versus strain rates, and grain size and orientation of sea ice and the ice of the Erebus Glacier Tongue.

Three strain meters will be set up to measure the natural oscillations of the Erebus Ice Tongue over a 12-month period. Recording equipment will be placed in the Scott Base laboratory and a wave buoy will be placed in the sea near the end of the ice tongue in late January.

This season maintenance and supervision of the three historic huts on Ross Island will be continued by Antarctic Division staff from Scott Base. Besides basic maintenance where necessary close supervision and interpretative services will be provided for visitors to the sites, including any tourist parties from cruise ships.

Of the nine scientists from other nations who will take part in the New Zealand programme this season five are from the Japanese Polar Research Association. Dr Tetsuya Torii and his team will continue geochemical studies in the dry valleys. With him will be Drs Genki Matsumoto and Tsurahide Cho, and Mr Tamio Kawane. A woman geochemistry student, Chisato Tomiyama, who will work in the Miers and Taylor Valleys with a University of Waikato team, is also sponsored by the association.

Assistance to a number of New Zealand and United States projects in the McMurdo Sound area and the dry valleys will be provided again by Lands and Survey Department surveyors. Tony Hawke and David Manson will be associated with the Scott Base rebuilding project, control points for a detailed map of the Cape Bird area, McMurdo Ice Shelf and sea ice movement studies, the CIROS project, and the Lower Taylor Valley drilling programme.

This season another stage of the Scott Base rebuilding programme, which began in the 1976-77 season, will be undertaken by the Antarctic Division, Ministry of Works and Development, and New Zealand Army tradesmen. An advance party flew south late last month to make an early start on the internal

finishing of the fourth stage of the programme completed last season — a new command centre which houses general administration offices, the telecommunications system, and postal services.

Next month work will begin on the fifth stage — erection of the shell of the physical sciences laboratory. Facilities at Arrival Heights 3 km north of Scott Base will be rebuilt in the next two summer seasons. Replacement buildings will be shipped south in January next year, but this season the only work planned will be preparation of the site and foundations.

Last season the mess block at Vanda Station was upgraded and new sleeping quarters were built. These will be completed this summer, giving Vanda sleeping accommodation for 12 persons.

Since 1969 a windmill-driven generator system has provided power for domestic lighting, radio, fire alarm, and

scientific instrumentation at Vanda. The original windmill was replaced in 1979.

In the 1980–81 season strong oscillating winds damaged the windmill blades beyond repair. Since then power has been provided during the summer by three banks of solar cells.

Early this summer a new wind generator mast will be sledged across the sea ice of McMurdo Sound to Marble Point. It will be airlifted to Vanda by United States Navy helicopter.

As in past seasons an Antarctic Division field leader and two field assistants will provide courses in basic snowcraft and survival techniques for United States and New Zealand air crews, a Coast Guard icebreaker crew, and American and New Zealand research and support staff. For the second summer a United States mountain instructor, David Lasorsa, will work with the three New Zealanders.

More logistic flights by RNZAF

New Zealand's regular contribution to the joint United States–New Zealand logistics pool agreement will be increased this season. Royal New Zealand Air Force Hercules aircraft will make 14 flights in Operation Ice Cube — two more than last season — to support the two countries' research programmes.

Early next month United States Air Force Starlifters will begin the summer

Chinese visitors

Last season Mr Li Xiong Chaung, deputy director of the Chinese Low Temperature Scientific Research Institute, spent several days in Antarctica to gain an insight into operations on the continent and the extent of New Zealand's science and support role. He was accompanied by an interpreter, Mr Zhou Changlin.

Mr Wu Heng, director of the Chinese National Antarctic Research Committee, and the deputy director, Mr Guo Kung, did not go south as reported in the June issue of "Antarctic". They remained in New Zealand.

airlift of men and materials from Christchurch to McMurdo Station. They will be joined between early November and December by RNZAF Hercules aircraft which will complete their flights before the sea ice runway in McMurdo Sound is closed for operations.

Two RNZAF helicopter crews will be attached to the United States Navy's VX-E6 Squadron and will fly on support missions as in past seasons. The RNZAF will also have a team flying in the squadron's Hercules aircraft throughout the summer. New Zealand Army and RNZAF cargo handling teams will also contribute to the logistic pool. They will work at Christchurch and on the McMurdo Sound sea ice and Williams Field ice shelf runways.

Prior warning

This year's midwinter day has passed but the Otago-Southland Old Antarctic Explorers' group has given early notice of a midwinter dinner next year at Lake Ohau. The date is June 16, 1984. For additional information write to Garth Varcoe, P.O. Box 13247, Christchurch or Ron Garrick, 46 Norton Street, Gore.

Winter team at Scott Base

One of New Zealand's most experienced mountaineers, Mr N. D. Hardie, who worked twice in Antarctica during the 1960s, has been appointed officer-in-charge at Scott Base for the 1983-84 summer season of the New Zealand Antarctic research programme. The deputy officer-in-charge will be Mr E. J. Saxby, who has spent four summers in Antarctica since 1974.

Norman Hardie, who is 58, is a Christchurch civil engineer. He first went south in 1962 when he was one of a team of six experienced New Zealand mountaineers who trained United States field parties in snowcraft and survival. In 1967 he was deputy leader and surveyor in the expedition led by Sir Edmund Hillary, which made the first ascent of Mt Herschel (3335m) in the Admiralty Range near Cape Hallett.

Since 1955 Norman Hardie has made nine visits to the Himalaya. He was a member of the British expedition which made the first ascent in 1955 of the world's third highest mountain, Kangchenjunga (8598m) in Nepal. On later visits he has climbed with Sir Edmund Hillary's expeditions, and as a director of the Himalayan Trust since 1964 has worked with him in the establishment of schools and hospitals in Nepal.

Vanda Station's leader next summer will be Mr M. MacFarlane, of Hamilton. He is a 27-year-old research scientist with the Ministry of Agriculture and Fisheries.

Ten men have been selected to winter at Scott Base through 1984. Six of the men are from the North Island and four from the South Island. Their ages range from 22 to 40.

Members of the winter team are:

R. Vardy (31), Auckland. Base engineer. He is a mechanic with a motor firm.

I. MacDonald (25), Christchurch. Chef. He is a supervising chef with a Christchurch hotel, wine, and spirit firm.

I. Sayers (40), Hamilton. Postmaster.

M. Kennett (24), Dunedin. Senior Post Office technician.

B. Hobern (30), Cambridge. Electrician. He is a Ministry of Energy technician.

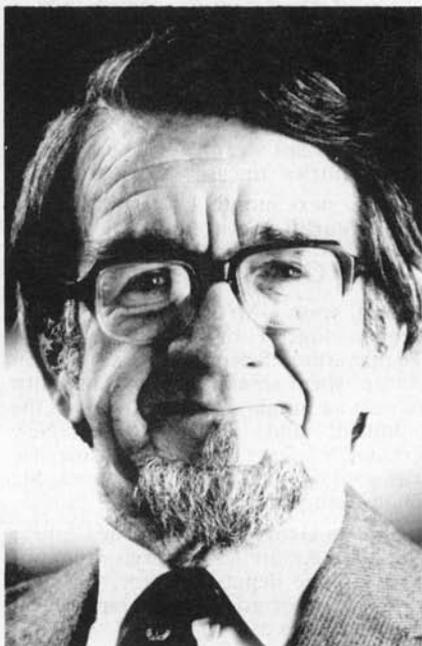
A. Pallesen (22), Rotorua. Mechanic. He is a diesel mechanic with the Forest Service at Kaingaroa.

C. Fry (25), Christchurch. Technician. He works for a Christchurch electronics firm.

R. Holwerda (25), Wellington. Technician. He is a test technician with A.W.A. (N.Z.) Ltd.

J. Ireland (22), Auckland. Technician. Corporal Ireland is an avionics technician with the Royal New Zealand Air Force.

A. Roy (30), Ashburton. Field leader/dog handler. He is a musterer.



NORMAN HARDIE

SUMMER RESEARCH PROJECTS

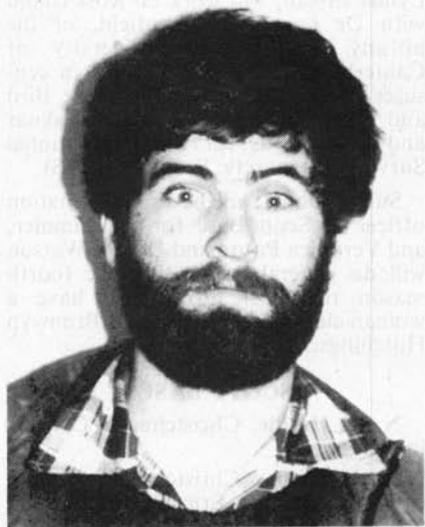
This summer New Zealand scientists will work in the Horlick Mountains only 550km from the South Pole, from a United States research ship in the Ross Sea, and on Ross Island. Others will work in McMurdo Sound, on Mt Erebus, and in the dry valleys of Victoria Land. A special team will work at Cape Hallett on a plan to clean up the joint United States-New Zealand research station which was closed in 1973. They and the scientists are all members of field parties in the Antarctic research programme for the 1983-84 season. Including support, logistic, and construction activities, the programme will call on the services of more than 200 men and women.

Research projects will be conducted by scientists from five New Zealand universities, and the research programme will also draw on staff from the Antarctic Division, Ministry of Works and Development, Geological Survey, Geophysics Division, Physics and Engineering Laboratory (Geophysics Observatory), Soil Bureau, Ecology Division, Division of Marine and Freshwater Science, Lands and Survey Department, Meteorological Service, Commission for the Environment, Canterbury Museum, Post Office, New Zealand Army and Royal New Zealand Air Force. New Zealand scientists will also work with guest scientists from the People's Republic of China and Brazil, and a fourth foreign visitor will be a logistics expert from Uruguay.

Men and women in the programme will work at or from Scott Base, on the sea ice in McMurdo Sound, at Cape Bird, Cape Royds, and Cape Armitage, and in the dry valleys. One team will be 550km from the South Pole in the Ohio Range of the Horlick Mountains. New Zealanders will also work with Americans and Japanese in the dry valleys and at the summit of Erebus.

Vanda Station in the Wright Valley 130km from Scott Base will be operated again this season by a team of three men led by Mr Malcolm MacFarlane. They will provide logistic support for New Zealand, United States, and Japanese field parties, and also meteorological information. Field stations at Lake Fryxell in the Taylor Valley and at Cape Bird will also be used by New Zealand field parties.

Last season the mess block at Vanda was upgraded and new sleeping quarters were installed. The sleeping quarters which have room for 12 persons will be completed during the summer.



MALCOLM MacFARLANE

There are 14 women in the programme this season — the largest number since New Zealand research began in the Ross Dependency. Ten are scientists, including a Japanese guest geochemistry student and a Chinese geologist Xie Youyu. Four other women will work at Scott Base.

Two geologists will work in the Ohio Range. Margaret Bradshaw will lead the second Canterbury Museum expedition to the area, and her team will include Jane Newman, of the University of Canterbury.

Studies of organic matter in soils of penguin rookeries will be made at Cape by a Soil Bureau team which includes Jan Heine and Valerie Orchard. The team will also work in the Wright Valley. The Japanese geochemistry student, Chisato Tomiyama, will join the University of Waikato expedition in the Miers and Taylor Valleys, with Jan Clayton-Greene and Fiona Judd.

Connie Vincent, of the Marine and Freshwater Science Division, D.S.I.R., with her husband and Dr Clive Howard-Williams, will study the plant ecology of South Victoria Land streams in the dry valleys and at Cape Bird. A biologist, Lynda Logan, will work on Ross Island with Dr Laurence Greenfield, of the botany department, University of Canterbury, and will take part in censuses of Adelie penguins at Cape Bird and Cape Royds, and studies of skuas and other birds for the International Survey of Antarctic Seabirds (ISAS).

Sue O'Dowd will be the information officer at Scott Base for the summer, and Veronica Paton and Debbie Watson will do general duties. For the fourth season the Post Office will have a woman clerk at the base. She is Bronwyn Hutchings.

SCOTT BASE

N. D. Hardie, Christchurch. Officer-in-charge.

E. J. Saxby, Christchurch. Deputy officer-in-charge. Eric Saxby was an assistant maintenance officer at the base in 1974-75, and in 1975-76 worked with United States salvage teams on the recovery of wrecked Hercules aircraft at Dome C in Wilkes Land. He was in charge at Vanda in 1977-76, and in the 1981-82 season was the New Zealand base camp representative in the United States-New Zealand-Australia expedition which worked in Northern Victoria Land.

G. Stockman, Storekeeper.

N. Smith, Auckland. Mess manager.

M. Cleeton, Auckland. Chef.

B. Telfer, Upper Hutt. Assistant maintenance officer/carpenter.

I. Hodgkinson, Nelson. Assistant maintenance officer/mechanic.

D. C. Emett, Christchurch. Assistant maintenance officer.

C. Mitchell, Huntville. Assistant maintenance officer.

R. Ridley, Ohakea. Meteorological observer.

Sue O'Dowd, Hawera. Information officer.

Veronica Paton, Rotorua. General duties.

Debbie Watson, Wellington. General duties.

Bronwyn Hutchings, Invercargill. Post Office clerk.

B. Reeks, Palmerston North. Post Office technician.

VANDA STATION

M. MacFarlane, Hamilton. Officer-in-charge.

K. E. Meyer, Hamilton. Assistant maintenance officer.

M. Fraser, Wellington. Meteorological technician.

P. Sampson, Christchurch. Field assistant.

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

Ministry of Works and Development. Hydrology and glaciology in dry valleys. J. Robertson and B. Mason (field assistant).

Canterbury Museum. Geology of the Ohio Range. Margaret Bradshaw (leader), Jane Newman, Jonathan Aitchison (geologists), W. Atkinson (field leader). Geological Survey. Deformation survey of Mt Erebus. S. Currie (MOWD), B. Scott (Geological Survey).

Geophysics Division. Seismological studies by Scott Base laboratory staff.

Soil Bureau. Studies of penguin rookery soils at Cape Bird, and comparison with Wright Valley soils. Dr T. Speir, Jan Heine, Valerie Orchard (Soil Bureau), H. Konlechner (botany department, University of Canterbury).

Physics and Engineering Laboratory. Measurements of strain and movement of McMurdo Sound sea ice and Erebus Glacier Tongue. Dr W. Robinson, T. Haskell, A. Heine and Scott Base laboratory staff.

Joint project with Commission for Environment on physical characteristics, sediments, and drift tracks of icebergs in McMurdo Sound/Ross sea region. Dr H. R. Keys (Commission for the Environment), Dr M. McDonnell (PEL), K. Piddington (Commissioner for the Environment).

Continuation of upper atmosphere studies at Scott Base and Arrival Heights. Visits to field magnetic stations at Cape Evans, Cape Royds, and Vanada Station. C. Roper, P. Johnston, Scott Base laboratory staff.

Ecology Division. Aerial survey of Adelie and Emperor penguin colonies, North Victoria Land coast and Cape Royds. R. Taylor, Dr P. Wilson.

Marine and Freshwater Science Division. Plant ecology of streams in dry valleys and at Cape Bird. Drs W. Vincent and C. Howard-Williams, Connie Vincent.

Lands and Survey Department. Two surveyors will provide survey assistance for New Zealand and United States field events in McMurdo Sound region and dry valleys, and begin control work for a new topographical map of Cape Bird. A. Hawke, D. Manson.

Meteorological Service. Observation programmes at Scott Base and Vanda Station. Joint atmospheric turbidity project with University of Alaska.

Antarctic Division. Monitoring movement of McMurdo Ice Shelf with Lands and Survey team.

Annual Adelie penguin census at Cape Royds, a site of special scientific interest, by Scott Base staff in November, December, January.

Maintenance and supervision of historic huts on Ross Island. Scott Base staff.

Snowcraft and survival training for New Zealand and United States staff. L. Main (field leader), K. West and R. Hall (field assistants).

For the 11th successive season Scott Base staff will continue at the base and Arrival Heights the University of Canterbury mechanical engineering department's project to determine the effect and degree of atmospheric corrosion on aluminium.

Antarctic Division-Victoria University of Wellington. Continuation of long-term study of the effects of stress and isolation on Scott base winter teams (1983 and 1984). Professor A. J. W. Taylor, professor of clinical psychology.

International projects. These are projects on which New Zealanders will work with representatives of other nations or with guest scientists in the New Zealand programme.

Cape Hallett assessment. A New Zealand and American team will assess the condition of the joint United States-New Zealand station at Cape Hallett which was closed in 1973.

Ross Sea seismic cruises. One New Zealand scientist, Dr F. Davey (Geophysics Division) will join American scientists aboard the U.S. Geological Survey's seismic research vessel Samuel P. Lee on a geological-geophysical survey between New Zealand and Antarctica.

Taylor Valley glacial geology. United States and New Zealand scientists will study the late Cenozoic glacial history of the lower Taylor Valley. Drs D. Elston, H. Rieck (U.S. Geological Survey), C. Hendy (University of Waikato), drillers J. Hay, S. Pilcher (Antarctic Division), B. Morris, W. Potter (Victoria University of Wellington).

UNIVERSITY PLANS

Granite Harbour sediment studies

Studies of seafloor sediments in Granite Harbour, basement rocks in the Transantarctic Mountains, and glacial deposits in the Taylor Valley, are among projects to be carried out by university scientists during the New Zealand research programme this season. Other university parties will study marine organisms in glacial melt waters off Cape Bird, and investigate the precipitation of electrons in the D-region of the ionosphere.

Five universities — Auckland, Victoria, Canterbury, and Otago — will contribute teams to this summer's programme. They will work with scientists from the United States and Japan. Two geologists from the University of Canterbury will be with a Canterbury Museum expedition to the Horlick Mountains 550km from the South Pole.

Waikato University's 14th expedition will work in the Miers and Taylor Valleys and the Asgard and Olympus Ranges. Dr Chris Hendy's team will be associated with the international drilling project in the Lower Taylor Valley which will be carried out by scientists from the New Zealand Geological Survey and the United States Geological Survey, Arizona.

Geomorphic processes in the Taylor Valley and the Asgard and Olympus Ranges will be studied by L. Gaylor, W. R. Doolin, and D. Bailey. Led by Dr Mike Selby, the group will examine glacial and periglacial deposits and processes, slope forms and slope development, and the influence of rock strength and joints upon slope development.

In association with drilling of core samples by the Lower Taylor Valley project Dr Hendy and three geochemistry students, Jan Clayton-Greene, Fiona Judd, and Chisato Tomiyama (Japanese Polar Research Association) will make detailed studies of surface exposures of Upper Quaternary glacial-lacustrine sediments. The primary objective is to elucidate the invasion of the dry valleys by ice and meltwaters from successive

Ross Sea ice sheets and, if possible, to establish the chronology back beyond the 200,000 years already available from surface exposures.

MARINE RESEARCH

This summer scientists from three universities will be concerned with Antarctic fish and marine animals under the sea ice of McMurdo Sound and in the waters off Cape Bird. An Auckland University group will continue its research into the neurobiology and respiratory physiology of fish which will be caught through holes in the sea ice. The group will use a fish hut at locations off Pram Point and Cape Armitage.

From late October to the middle of December Dr John MacDonald and Dr Rufus Wells will continue the work they have done for several seasons. With them will be Drs John Montgomery, M. Paulin, and William Davison (zoology department, University of Canterbury).

Three investigators under the direction of Dr Montgomery will record responses to movement from the fish inner ear and possible from other components of the vestibulo-ocular pathway. A second project will be to record responses to temperature stress and hypoxia in species of *Trematomus*.

A third project started in 1981 will be continued after the completion of the first two projects. Two or three members of the team will measure, tag, and release fish in an area just west of Cape Royds. They will assess growth

and age structure of the population, and attempt to determine population size and mobility.

BLOOD SAMPLES

Samples from the University of Auckland programme will be used by a Victoria University of Wellington biochemist, Cam Falkner. He will take blood samples from Antarctic cod and separate the enzyme glutathione S-transferase. This enzyme is important in protecting blood from cold temperatures, and also acts as a defence mechanism against toxic substances.

Studies of the enzyme will be made to determine why it is cold resistant and how much it is a detoxification agent. The studies may reveal the extent to which toxic agents such as DDT accumulate in species such as Antarctic cod which are higher in the Antarctic food chain.

Four scientists from the University of Otago departments of physiology and zoology will spend a month at Cape Bird examining the population sizes and dynamics of marine organisms in the glacial melt waters, and testing the ways in which they withstand freezing. Dr John Leader (physiology) and Alastair Innes, (zoology) and Robert Scott and Peter Ashworth (physiology) will make microscopic examinations of selected species to determine the effects of different rates of freezing and thawing on survival. They will also observe the growth and behaviour of ice crystals during freezing to gain some insight into the mechanisms involved.

SEAFLOOR SEDIMENT

Two teams from the 28th Victoria University of Wellington Antarctic Expedition (VUWAE-28) will be in the field early this season. In October both will work in the Granite Harbour area on projects in the New Zealand earth science programme.

For the last three years parties led by Alex Pyne have been carrying out a systematic investigation of seafloor sediments in different parts of McMurdo Sound. In the 1981-82 and 1982-83 seasons their studies extended into

Granite Harbour, a deep basin separated from the rest of the Ross Sea, and thus virtually a closed system. As a result it represents an important study area for sedimentary processes and development of a sediment budget.

If the sea ice is safe and a suitable route can be found across McMurdo Sound to Marble Point and Granite Harbour late this month by a CIROS reconnaissance team, an attempt will be made next month to transport the VUW heated sampling wannigan on a tractor-drawn sledge to Granite Harbour. Using motor toboggans the party will put sediment traps in position in the Granite Harbour area where they will remain until the project ends.

With Alex Pyne, a veteran of six previous expeditions, are Tony McPherson and Paul Currie of the VUW Antarctic Research Centre, and John Watson, an Antarctic Division mechanic and field assistant. Three members of the party will fly south next month. Paul Currie will follow early in November.

BEDROCK STUDIES

Field work on the first stage of the VUW Antarctic Research Centre's three-year programme of bedrock studies of the Transantarctic Mountains will begin next month. Using their own motor toboggan support Paul Fitzgerald (leader) and Mark Webster will work in the Granite Harbour area with Alex Pyne's team until November.

With United States Navy helicopter support the team will work at a number of sites in the dry valleys during December and January. These sites are Lower Victoria Glacier, Mt Barne, Mt Doorly, Ferrar Glacier, and Lake Vida.

Field-oriented bedrock studies are designed to achieve a better understanding of the Transantarctic Mountains. They will cover (1) detailed mapping and structural analysis of key areas for understanding relationships between basement rock units; (2) detailed mapping and fission-track dating to determine the style and history of tectonism at the Transantarctic Mountain Front; (3) paleogeology and tectonics of the Ross Sea region during Beacon sedimentation.

A project on the precipitation of electrons in the D-region of the ionosphere will be conducted at Scott Base, Arrival Heights, and Vanda Station, by David Boteler and Robin Willink, of the VUW physics department with the assistance of base laboratory staff. The team will spend one week in December at Vanda conducting a preliminary magnetotelluric survey, using instruments run by solar panels.

Radio receivers will be installed and operated at Scott Base to record whistlers (dispersed sets of radio frequencies travelling through the magnetosphere from one hemisphere to another). From these recordings it will be possible to investigate the spacial extent of electronic precipitation in the D-region, check on the "Trimpi effect" (large VLF amplitude changes that occur in the Antarctic), and examine the ways frequencies are transmitted through the ionosphere.

Once again the University of Canterbury physics department team headed by Dr Andre von Biel will continue the investigation of the normal and disturbed ionosphere D-region. This project is planned to last 10 to 15 years (at least one solar cycle).

A high-powered transmitter at Scott Base which sends pulses into the atmosphere, and a receiving antenna array at Arrival Heights, are used for a number of experiments. The major experiments are the study of ionospheric winds, D-region electron density profiles on a diurnal and seasonal basis, and the effect of the polar ice-cap on absorption and ionisation.

This season the work will include checking equipment and instruments, calibration, installation of new electronics, and month reporting of results to New Zealand. Drs von Biel and Graeme Fraser, and two technicians, Ray Borrell and Ross Ritchie will check existing equipment and install new equipment; operation and regular reporting will be done by base laboratory staff.

As part of the New Zealand contribution to this season's programmes of the

International Survey of Antarctic Seabirds (ISAS) a team from the University of Canterbury will undertake a census of the Cape Bird colony. Dr Laurence Greenfield of the botany department, and Lynda Logan, will also visit Cape Royds early in December during the census of the Adelie rookery there which will be carried out on four visits between October and January by Scott Base staff.

Work at Cape Bird where the penguin census has been done since 1965 will include recording penguin band numbers and banding of untagged birds, more banding of skuas, and reading skua bands. Systematic observations of other birds and mammals will also be made.

Dr Greenfield will also inspect again the experimental site of Keble Valley, Cape Bird, where he has been investigating re-colonisation by macro and micro flora and fauna. Last season he prepared small oil-contaminated plots of ground to determine the long-term effects of oil on the biology of soils in Antarctica.

Pole all at sea

Seventy-four years ago Douglas Mawson, Edgeworth David, and Forbes MacKay were the first and only persons to stand at the South Magnetic Pole which they reached on January 16, 1909. They fixed its position (72.4deg S/155.3 deg E in Victoria Land) by direct measurements.

Since then the SMP position has been determined only from analyses of global magnetic observatory and survey results. From an analysis made in 1980 by scientists from the Australian Bureau of Mineral Resources the SMP is estimated now to be about 1000km north-west of Mawson's location, some 100km out to sea from the French station, Dumont d'Urville.

In the short-term the SMP, which appears to have been almost stationary since about 1965, is unlikely to move onshore. How it will move in the future is unknown.

Plan to clean up closed Hallett Station

Ten years of exposure to gales, snow and ice drift, have left Hallett Station, one of the original International Geophysical Year stations, in a poor condition. Operated jointly by the United States and New Zealand from 1957 to 1965 the station was closely permanently in 1973.

Since then buildings have been damaged beyond repair; heavy machinery and tools are badly rusted, and food in cans has become inedible or unpalatable because of rust and damp. Most items of value were removed when the station was closed; what remains continues to deteriorate. In addition seepage of oil from drums and near the main fuel tank which still holds 55,000 gallons, represents a potential environmental hazard.

Last season a New Zealand biological research team which worked for two months at Cape Hallett also made a complete inventory/status report on the station. The report covered the present condition and possible future use of the buildings, the state of their contents, seepage from fuel drums, and the distribution of waste materials.

As a result of this report a United States-New Zealand team of four led by Mr Garth Varcee, the Antarctic Division's buildings officer, will spend two to three weeks at Hallett Station in January. The team will travel to Cape Hallett aboard the United States Coast Guard icebreaker Polar Sea and will return to McMurdo Station about January 31. It will make initial assessments of the present state of the station, deal with the leaking fuel drums, and prepare a plan for a major operation to clean up the station in the 1984-85 season.

Located some 643km north of Scott base, the station was built in 1956-summer at the north end of Seabee Spit (now Seabee Hook) a low recurved spit in Moubray Bay which projects about .8km west of the high rocky ridge forming Cape Hallett. "Thirty dirty Seabees" of the United States Navy's Mobile Construction Battalion I completed the building construction in six days.

Like all the "Seven Cities of Antarctica" established by the United States for IGY Hallett Station was built in a hurry and under extreme difficulties. The United States Coast Guard icebreaker Northwind and the cargo ship Arneb arrived off Cape Hallett on December 29 with men, equipment, supplies, and machines to establish the station.

A site of 1.6 hectares was selected for the station on the spit but it was in the middle of an Adelie penguin rookery. Carl Eklund, the biologist who was science leader at Wilkes Station for IGY had estimated in November that the rookery contained 65,000 breeding pairs; a non-scientific estimate of the total population put it at some 150,000.

There was no other suitable site so a decision was made to relocate some 6,000 of the rookery occupants. On December 30 United States, New Zealand, and Australian scientists and men from the two ships were landed by helicopter to begin Operation Penguin Lift under the supervision of an ornithologist. Some protesting penguins tried to return; they were kept out first by a netting fence. It was blown down by a storm and had to be replaced by a barricade of diesel fuel drums.

Operations were halted on New Year's Eve by a 60-knot gale. Both ships were

battered savagely by wind and ice for nearly 24 hours. By late January 1 the Arneb was badly flooded because of holes punched in her hull by ice, and the Northwind was minus a blade from her starboard propeller.

But the storm blew the ice out of Moubray Bay, and the ships were able to anchor 91m from the beach. Shore fast ice was blasted out by Navy frogmen, and on January 2 landing craft began to shuttle cargo to the beach. Seabees swarmed over the site, and prefabricated permanent buildings were hammered together almost overnight.

FIRST THREE

On January 9 six days after construction began the Northwind and the Arneb were under way for McMurdo Sound where the full extent of the damage to both ships could be assessed. Behind them they left a winter team of 11 Americans and three New Zealanders, two years' supply of food, huge stocks of books, films, records, and other recreational equipment.

First New Zealanders to winter at Hallett Station were C. E. Ingham, J. G. Humphries and M. W. Langevad. Their scientific work attracted little public attention back in New Zealand; everyone was more interested in Scott base, Hilary, and the South Pole. But like the men who spent their first winter at Scott base they also were awarded the Polar Medal.

Between 1957 and 1964 another 21 New Zealanders wintered at Hallett. The station was maintained logistically by the United States and New Zealand was responsible for programmes in ionospheric, seismology, geomagnetism, and the greater part of the auroral programme. Every second year a New Zealander was station scientific leader. The leaders were: J. A. Shear (U.S.), 1957; K. W. Salmon (N.Z.), 1958; R. Roberts (U.S.), 1959; R. B. Thomson (N.Z.), 1960; R. W. Titus (U.S.), 1961; C. B. Taylor (N.Z.), 1962; H. Freimanis (U.S.), 1963; N. M. Ridgway (N.Z.), 1964.

On March 6, 1964 a disastrous fire completely destroyed the main scientific

building and the equipment operated by the three New Zealanders each year. Until 1973 the station was occupied only in the summer months, chiefly by United States scientists engaged in biological research. It was also a communications and weather reporting station on the air route between Christchurch and McMurdo Station.

SIAMESE CAT

In its first year Hallett Station proudly claimed the only fur-lined lavatory seat in Antarctica — built by one of the New Zealanders of course. The next year a young Siamese cat named Poppaea wintered at the station and then went to live in the United States instead of back in New Zealand. An unusual visitor in 1958 was a German Shepherd dog which arrived beside the pilot on the flight deck of a United Navy C47 (Dakota).

Two New Zealand hedgehogs arrived during the 1961–62 season as stowaways from Lyttelton aboard the United States Coast Guard icebreaker Eastwind. While ashore they were temporary pets of the New Zealanders. Their visit lasted only a few days; the Eastwind's captain decided they were superfluous crew. The station was in the news again in 1963 when a United States scientist succeeded in growing Kentucky bluegrass out in the open, and in 1964 one of the last three New Zealanders, Neville Green, rescued his young budgerigar from the fire. The bird thus missed the chance of wintering in Antarctica.

Hallett Station had some more serious events in the days when it was a permanent base all the year round. It was the first in Antarctica to recognise in its auroral records during the 1958 winter the effect of nuclear bomb tests in the Pacific.

Hallett's most serious emergency came on October 16, 1958. A United States Air Force Globemaster on a flight from Christchurch hit a hill 48km to the north when coming in for an airdrop to the station. Six of the men aboard were killed in the crash. The New Zealanders joined their American colleagues in helping to rescue the survivors.

U.S. PROGRAMME

West Antarctic ice sheet project

A three-year study of the West Antarctic Ice Sheet, which will begin this season, is one of the major projects in the United States Antarctic Research Programme. Glaciologists will work from field camps along the Siple Coast on the east side of the Ross Ice Shelf to obtain more information about the ice sheet's stability, its response to climatic changes, and its relationship to global climate.

This season more of the 90 projects in the programme than usual will be undertaken from research vessels or supported by Coast Guard icebreakers. The G. W. Melville, operated by the Scripps Institution of Oceanography, will work in the Weddell Sea and the Indian Ocean, the United States Geological Survey's Samuel P. Lee will make an international geological/geophysical survey between New Zealand and Antarctica, the National Science Foundation's Hero will support marine biology projects in the Antarctic Peninsula area, and the Knorr, owned by the Woods Hole Oceanographic Institution, will make an oceanographic survey along the Odeg meridian in the South Atlantic as far south as ice conditions permit.

Only one icebreaker, the Polar Sea, will operate in the Ross Sea this summer. She will break the ice channel to McMurdo Station for the tanker Maumee and the cargo ship Southern Cross, pick up a combined United States-New Zealand party from Hallett Station, and then support an oceanic heat experiment in the Ross Sea.

When the Maumee and the Southern Cross have left McMurdo Sound the Polar Sea will begin a cruise eastward along the coasts of Marie Byrd Land and Ellsworth Land. Scientists aboard will carry out geological work at Siple Island, Pine Island Bay, and Thurston Island.

A veteran icebreaker, the Westwind, now 40 years old, will make two cruises to the Weddell Sea from Punta Arenas, Chile. She has been used by the Coast

Guard for icebreaking in the Great Lakes, and has not been in Antarctic waters since 1967.

On her first cruise the Westwind will join the Melville to support research along the edge of the sea ice for AMERIEZ — Antarctica Marine Ecosystem Research in the Ice Edge Zone. This project includes studies of krill, seals, plankton, and seabirds. The Westwind's second cruise will be to support scientists working on Seymour Island and other islands off the east coast of the Antarctic Peninsula.

MAJOR PROJECT

Scientific projects and logistic support for the United States research programme, and the maintenance of its four permanent stations, all financed and coordinated by the National Science Foundation, are expected to cost more than \$100 million. More than 280 scientists will do research on the continent and in southern waters. They will work with representatives of nine or more other countries with polar interests.

Another major project this season will be a joint investigation with the British Antarctic Survey to gain more understanding of the tectonic development of West Antarctic and its relation to East Antarctica. This project will be continued in the 1984-85 season.

BAS geologists and geophysicists, using Twin Otter aircraft, will conduct aeromagnetic surveys, and a team from the Lamont-Doherty Geological Observatory, led by Dr Ian W. D. Dalziel, will

use motor toboggans to carry out field research in geology, paleomagnetism, geochronology, and geophysics with radio-echo sounding. Both parties will be based in the Martin Hills (82deg 04min S/88deg 01min W) and will also work in the Ellsworth Mountains, near Siple Station, and at Mt Smart and in the Jones Mountains.

More than 20 scientists from four institutions will work in the Siple Coast programme between November and January. Their purpose is to find answers to such glaciological problems as the West Antarctic Ice Sheet's possible instability, the behaviour of the ice during the last glaciation and the last interglacial period, and how the ice sheet grows and shrinks.

RADAR STUDIES

A University of Wisconsin team headed by Dr Charles R. Bentley will conduct radar studies of the ice sheet and subglacial bedrock with a new vehicle-mounted digital recording system supported by a computer at a base camp. The team will gather information on ice thickness, movement rates, how the ice moves, and the internal characteristics of the ice sheet.

An Ohio State University group headed by Dr Ian M. Whillans will study the Siple ice dome and two fast-moving major ice streams which drain the West Antarctic Ice Sheet and feed the Ross Ice Shelf. The group's main objective will be to determine whether the ice is growing or shrinking.

A third team led by Dr Robert A. Bindschadler, of the National Aeronautic and Space Administration's Goddard Space Flight Centre, will assess the present state of the ice sheet and determine its likely response in changes of climate or ocean behaviour. The team will measure the strain at the mouths of the ice streams and on major ice domes. It will also try to establish the precise location of the grounding line of the ice sheet.

Additional information on present and past ice conditions and ice stream dynamics will be obtained by taking ice

temperatures from selected sites at 9m depths. The holes will be drilled and the ice cores retrieved by a team from the Polar Ice Coring Office (PICO) of the University of Nebraska at Lincoln.

MARINE FOSSILS

Another team from Ohio State University headed by Dr John H. Mercer, which includes two New Zealanders, Dr Barrie McKelvey and Carl Thompson, will concentrate its study of the West Antarctic Ice Sheet and its interaction with portions of the East Antarctic Ice Sheet chiefly in the mountains near the south-eastern extremity of the Ross Ice Shelf: those parts of the Horlick and Queen Maud Mountains that border the upper half of the Reedy Glacier, and the Harold Byrd Mountains nearby at lower elevations.

Last season Dr Mercer led a team which discovered a wide variety of marine microfossils scattered along a 1609km stretch of the Transantarctic Mountains. This season's team will study glacial sedimentation in two ice-free areas to assist in determining the size and frequency of Antarctic ice sheet fluctuations some 65 million years ago, and search for more fossils.

Possible radioactive elements in West Antarctica and the relationship of extinct volcanoes in Marie Byrd Land and Ellsworth Land to the glacial and tectonic history of the western part of the continent will be studied by scientists during the Polar Sea's cruise along the coasts. A resource and radioactivity survey will be made for the first time on the coast of the Pine Island Bay — Mt Siple area.

Since 1976 surveys for radioactive elements have been made in portions of south and northern Victoria Land, the Darwin Glacier area, the Ellsworth Mountains, and Marie Byrd Land. These have shown that substantial differences in potential for uranium and thorium exist from area to area. Drs Edward J. Zeller and Gisela Dreschoff, of the Radiation Physics Laboratory, University of Kansas Space Technology Centre, will conduct this season's survey

using a gamma-ray spectrometer carried in the Polar Sea's helicopters.

Geologists from the University of Colorado aboard the Polar Sea will visit volcanoes along the coasts of Marie Byrd Land and western Ellsworth Land. Studies in the Ross Sea area from Cape Adare to Beaufort Island last season indicated that apparently no volcanoes erupted beneath a thick ice sheet as has been found in Marie Byrd Land.

Dr Wesley E. LeMasurier's team is particularly interested in Mt Siple (73deg 15min S/126deg 44min W) and Mt Murphy (75deg 20min S/110deg 44min W). Photographs indicate that Mt Siple (3110m) is a major volcano almost as large as Mt Erebus; whether it is active or dormant is not known. Mt Murphy is critical to understanding past ice thickness levels at the time of volcanic eruptions.

Seymour Island, south of Erebus and Terror Gulf off the north-east tip of the Antarctica Peninsula where the first fossil bones of a land mammal to be found in Antarctic were discovered in the 1981-82 season, will be the main target of scientists from four universities this season. They will search for plant and animal fossils on Seymour, James Ross, Snow Hill, Cockburn, and Vega Islands, supported by the Coast Guard icebreaker Westwind.

Dr William J. Zinsmeister, organiser of the expedition, will head on Ohio State University team, Dr Sanaka Chatterjee will lead a group from Texas Tech University, Dr Michael Woodburne will head a group from the University of California at Riverside, and a New Zealander, Dr Rosemary A. Askin, is leader of the Colorado School of Mines project. All four took part in the 1981-82 expedition which discovered the fossils of a land mammal and marine vertebrates which thrived in the Cretaceous and Early Tertiary periods — 135 to 40 million years ago.

PLANT SAMPLES

Dr Chatterjee's group will search for more evidence of marine Cretaceous vertebrates on Seymour Island. Dr

Zinsmeister will map sedimentary rock outcrops on the islands as part of an effort to understand the development of invertebrate life of the area over geologic time, and Dr Woodburne's group will follow up the discovery of land mammal fossils on Seymour Island by searching for more specimens. Dr Askin's team will collect samples of fossil plant specimens and pollen to try to determine an evolutionary sequence for former plant life on the continent millions of years ago.

Oceanographers from Lamont-Doherty Geological Observatory, and United States and South African geophysicists will go to sea aboard the Polar Sea and the Melville to carry out projects far apart; one in the Ross Sea and the other in the Indian Ocean.

Dr Robert L. Fisher, of the Scripps Institution of Oceanography, will lead a team of 18 scientists from the institution, the Bernard Price Institute of Geophysics, Johannesburg, and the University of Cape Town, which will work from the Melville near Prince Edward and Marion Islands. They will try to determine variations in the geochemistry of the earth's upper mantle, and locate hot spots which may be the cause of the movement of tectonic plates.

Part of the global mid-oceanic ridge, the Southwest Indian Ridge separates the African tectonic plate from the Antarctic plate. The scientists will dredge rock sample along the ridge where the water is 914m to 5486m deep. Variations in the geochemistry of the rocks will tell them where active upwelling is taking place in the mantle.

In a project known as the Ross Sea Heat Flux Experiment the oceanographers aboard the Polar Sea will monitor the flow of ocean heat from the north into the region beneath the Ross Ice Shelf. They will retrieve three current meter arrays deployed last season to collect data on water flowing beneath the ice shelf, and deploy 10 more current meter arrays at selected sites in the Ross Sea for the project which will be continued next season.

Melting at the base of ice shelves is believed to be controlled by oceanic heat

flowing in from northern regions, and is a significant factor in their stability. Glaciologists think that ice shelves may control the size of the West Antarctic Ice Sheet which in turn affects global sea level changes.

Although Siple Station in Ellsworth Land will be closed in January until November, 1985, the level of scientific activity will be high this summer. Stanford University scientists will continue upper atmosphere studies for most of the season, and for the first time an ice core drilling project will be conducted at the station. An attempt to recover a 200m core will be made by the Polar Ice Coring Office team.

United States, French, and Swiss scientists will take part in drilling projects at the Amundsen-Scott South Pole Station. PICO will continue drilling in the 237m hole to obtain more information about past atmospheric constituents and climatic conditions.

Dr Bernhard Stauffer will head a team from the University of Bern, Switzerland, which will help to analyse and process the ice cores drilled by PICO. The Swiss are concerned with atmospheric concentrations of carbon dioxide before the Industrial Revolution, the history of increases from pre-industrial times to 1958, and variations in concentrations during the last few thousand years. Annual snow accumulation at the Pole is such that a 457m ice core will reach back several thousand years.

DEEP DRILLING

As part of the International Antarctic Glaciological Project French and United States glaciologists will attempt to recover a core of 125,000-year-old ice from a depth of 2600m or 200m above bedrock. Research at the Pole has indicated that ice of that age can be found by drilling to 2600m.

Ice cores drilled from the surface of polar ice sheets to bedrock would answer many questions about the climate and atmosphere over the last 125,000 years but no coring equipment that can reach this depth has been designed. Now the Glaciological Laboratory at Grenoble

has designed and tested a thermal probe — the "Climatopic" — to sample melted ice continually from the surface to bedrock. The project will be headed by a leading French glaciologist, Dr Claude Lorius. Analyses of the melted ice samples will be focused on profiles of deuterium and oxygen-18 to describe climatic changes.

A 30.48m-high meteorological tower will be erected at the Pole to gather data on the concentration and rate of change of aerosols in the atmosphere. Dr Austin Hogan of the State University of New York at Albany will head a team that will try to find out how aerosols — fine solids or liquids — are removed from the air and settle on the ice. The precipitation of these materials on the ice is important in maintaining the stability of the atmosphere; the way precipitation occurs is not well understood.

Although many projects in this season's programme will be carried out in West Antarctica, the Weddell Sea, and the Antarctic Peninsula area, scientists will also be busy in the dry valleys of Victoria Land, on Ross Land, and on the sea ice of McMurdo Sound. As in past seasons United States and Japanese teams will work at the summit of Mt Erebus.

SEISMIC TRAVERSE

A 58km traverse of McMurdo Sound from the McMurdo Ice Shelf to a point west of Cape Bird on Ross Island will be made by a team of earth scientists led by Dr Lyle D. McGinnis, of Louisiana State University. Working in an area where the sea ice is 2.1m thick and the water is between 457m and 914m deep the scientists will gather seismic data of the earth's crust to the upper mantle — about 20.9km down. Their primary objective will be to obtain a crustal profile across the boundary between East and West Antarctica. Data acquired last season will be combined with this season's data so that the tectonic history of the Ross Embayment/Transantarctic Mountains can be placed in a global perspective.

Life under thick ice in McMurdo Sound and under the Ross Ice Shelf will

be studied by a research team from the Scripps Institution of Oceanography headed by Dr Paul K. Dayton. In the past life was believed to be sparse everywhere under the ice shelf, but recent data obtained from deep-water photography and by divers suggest that it is abundant and varied near White Island about 28km from McMurdo Station where the ice is between 18.2m and 30.4m thick.

Underwater photographs will be taken by the team at depths of between 60ft and 1500ft at seven sites under the ice near Ross Island. The team will work at White Island, Heald Island, Minna Bluff, Capes Royds and Crozier, and the Dellbridge Islands. Surveys will be

made of rapid swimming pelagic life forms in the sound and under the ice shelf. Coupled with current and density measurements the data collected will help to define better the ecological processes under thick ice.

A geochemist from Miami University of Oxford, Ohio, will lead a group of four scientists in a study of lakes in the dry valleys of Victoria Land. Dr William J. Green's group will concentrate on learning more about the geochemical processes that affect algae and other microscopic organisms in Lakes Fryxell, Hoare, Miers, and Joyce, and also about how trace metals are transported, removed, and recirculated in the lake waters.

Prelude to spring for two winter teams

Six flights from New Zealand by ski-equipped Hercules aircraft last month were a welcome prelude to Antarctica's spring for the 85 Americans and 11 New Zealanders who have spent the winter on Ross Island. They brought mail from home plus fresh fruit and vegetables, and gave Ross Island's winter community, which includes two American women, its first direct contact with the outside world for more than six months.

Three United States VXE-6 Squadron Hercules aircraft made the six flights from Christchurch — one less than last year — to prepare for the United States and New Zealand scientific programmes of the 1983-84 season. All 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.

But the prelude to spring was suddenly silenced by the harsh notes of winter on August 29. Three aircraft making the last flights landed at Williams Field, the permanent ice runway 13km from McMurdo Station in deteriorating weather. Instead of a one-hour stay on the ice the aircraft had to remain over-

night and were unable to fly back to Christchurch until August 30.

A snowstorm reduced visibility to zero and prevented vehicles from taking passengers from one aircraft to McMurdo Station and Scott Base. As a result 60 people — two air crews of nine each, 35 passengers, including 12 New Zealanders, and seven ground crew, had to shelter from the storm for nearly eight hours in the first aircraft to land. It had refuelled and was able to keep one engine running to maintain heat inside. Grapes and bananas, part of the fresh fruit cargo, provided some sustenance for those jammed together in the aircraft.

Winds, blowing snow, and low cloud delayed the first flights south until August 26 when two were made. Another was made on the evening of August 27 but poor visibility caused the postponement of two more planned for August 28.

When the three aircraft which began the last flights on August 29 were about 20 minutes past the point of safe return McMurdo Station reported that the weather was getting worse. Visibility dropped quickly after the first aircraft

landed but the 35 passengers were able to get off at the fuel pit and were then taken to the station.

But the 35 passengers on the second aircraft were not so fortunate. Vehicles could not take them away and a fuel line would not reach the aircraft so everyone had to move to the first aircraft which could provide heating by running one engine.

Meanwhile the third Hercules landed with only 360kg of fuel left, and in zero visibility. The pilot had to taxi his aircraft towards the control tower with the aid of instructions and radar vectors. During a break in the storm the crew of nine managed to reach the tower on foot.

When the weather finally cleared the passengers and ground crew on the first aircraft left for McMurdo Station and Scott Base. The two crews remained to monitor the running engine which had kept everyone warm.

Even the return flights were dogged by difficulties. One aircraft developed an oil leak from one engine and flew home on three engines. Another had pressurisation problems about 50km from McMurdo Station and had to return for repairs. But all three were back in Christchurch late on the evening of August 30.

After the air drop of mail and fresh food on June 24 the sight of new faces and aircraft on the ice instead of overhead was warmly welcomed by the 83 men and two women at McMurdo Station and the 11 men at Scott Base. When Winfly ended the spring population had grown to more than 240 men and two women at McMurdo Station and 24 men at Scott Base.

In spite of the hazards of winter operations the Hercules aircraft carried a total load of 48.9 tonnes on their six flights south. This included 22.8 tonnes of general cargo, 394 kilograms of personal and official mail, and 3.5 tonnes of fresh fruit and vegetables. The rest of the load was 22.1 tonnes for passengers and their baggage. On the return flights the aircraft brought back 2.7 tonnes of cargo, 318kg of mail, and seven

passengers, four of whom made the round trip.

Among the 176 passengers on the flights were technicians, equipment operators, cooks and construction workers who will prepare for the major airlift of men and materials for the summer by Hercules and Starlifter aircraft. The construction team will prepare the seasonal ice runway in McMurdo Sound for the flights by wheeled aircraft which begin on October 3.

Captain Brian Shoemaker, the support force commander, flew in the first aircraft to meet the McMurdo Station winter team and to initiate preparations for the new season. The aircraft was flown by VXE-6 Squadron's commanding officer, Commander M. Radigan. Fourteen New Zealanders, one of whom returned to Christchurch, were on the flights. They included 11 men from the Ministry of Works and Development and the New Zealand Army who will make an early start on construction work at Scott Base, and two Antarctic Division staff who will begin preparations for CIROS (Cenozoic Investigations in the Ross Sea), the long-term offshore drilling project in McMurdo Sound.

Sixty-one of the American passengers on Winfly went south to prepare for the United States Antarctic Research Programme (USARP). They included Mr Eric Chiang the National Science Foundation's representative at McMurdo Station, Mr R. Robbins, deputy resident manager at the station, representing ITT Antarctic Services, contractors to the NSF for support services, also 59 members of the contractors' staff.



Australia to buy marine research ship

Australia plans to acquire a specialised ice-breaking marine research vessel for its summer Antarctic research programme, and introduce air transport of staff to its three bases, Casey, Davis, and Mawson. The new transport system announced last month by the Minister of Science and Technology (Mr Barry Jones) is expected to be fully operational by 1988-89. Provision was made in the Budget for \$2.555 million to be spent this season on the first stages of the new system.

Plans for a new transport system were announced by the Liberal Government only three weeks before the General Election. ("Antarctic", March, 1983, P. 20). These were reviewed, like other major expenditure proposals, by the new Labour Government. Some changes have been made but the general concept of the marine research vessel is the same as proposed early this year.

Under the new system Royal Australian Air Force wheeled Hercules aircraft will fly between Hobart and a compressed snow runway at Casey. Light aircraft will be used to deploy staff between Casey and the other two stations, Davis and Mawson.

Site evaluation trials of the proposed runways at Casey and Davis will be made first, and the whole project will be considered by the Parliamentary Public Works Committee early next year. Environmental impact studies of all projects will be made to ensure that no harm will be done to the Antarctic ecosystem.

In addition to its marine science activities the research vessel will be required to carry and deploy research parties to otherwise inaccessible areas by long-range helicopters. Resupply of cargo to Antarctic bases will continue to be undertaken by chartered ice-strengthened vessels.

Expressions of interest in the design and construction of the research vessel will be invited overseas and in Australia later this year, and will be followed by the issue of tender invitations. A decision on the country of construction

will be made when tenders have been evaluated.

Plans for the vessel are that it should undertake marine biology and geoscience cruises in the waters of the continental shelf adjacent to Australia's Antarctic territory and in the Southern Ocean mainly in the summer. For the remainder of the year the vessel will serve as a national science facility in Australian waters.

Transport studies by the Department of Science and Technology indicate in general that the Antarctic research programme calls for a 6000-tonne ship 85m to 95m long with a range of 14,000 nautical miles, and a service speed of at least 12 knots. It would have the ability to navigate in up to 9/10 pack ice and break level ice of 0.8m thickness continuously.

Other requirements include a heli-deck and hangar for two helicopters two-berth cabins for 30 scientists and the capacity to carry 60 passengers for short periods. Also needed would be laboratories and facilities for marine biology, geology, geophysics, and chemistry, and oceanography, hydrography, meteorology, and environmental monitoring.



RAUER ISLANDS

Winter journeys over sea ice

Although the 21m auxiliary schooner Dick Smith Explorer has been locked in the ice of Prydz Bay, East Antarctica, for nearly six months the four men and two women aboard her have not been confined to winter quarters since they saw the sun depart on May 30. Led by Dr David Lewis the members of the Oceanic Research Foundation expedition have been busy tagging seals, catching fish, and hauling sledges on field trips across the sea ice to carry out scientific projects around the Rauer Islands in the south-east part of Prydz Bay.

Since late March the Dick Smith Explorer has been in her winter anchorage — a small shallow bay off Filla Island, the largest of the Rauer Islands. The group of rocky coastal islands is between the Sorsdal Glacier Tongue and Ranvik Bay to the south. Filla Island is about 55.5km from the Australian base, Davis, on the mainland. Ice began to form around the DSE in April, and when it started to thicken the cracking and heaving tilted the ship 10 degrees to starboard. But the ice pressure was eased by cutting a trench on the port side.

Low temperatures and winter darkness have not stopped the expedition from making sledge journeys to stock a food depot at Cape Drakon, 12m from the ship or longer trips southward. On July 13 David Lewis and the American anthropologist, Mimi George, who is deputy leader, made the first passage across the ice from Filla Island to Davis, 55.5km to the south-west — a nerve-racking three-hour journey between 41m-high tottering ice cliffs and shattered poorly frozen ice floes to seaward.

After an extended reconnaissance south of the Rauer Islands which was expected to end last month David Lewis plans to make extended sledge hauling trips again to the south, including the Larsemann Hills and Amanda Bay, until the middle of November. Science projects are expected to include seal tagging, seabird observations, Emperor penguin counts, lichen and moss collection, and fishing.

Before the sun departed on May 30 field and ship's food supplies were reorganised by Gill Cracknell, the English geomorphologist, and the Australian geologist, Jamie Miller. With the Danish naturalist, Jannik Schou they made two trips with supplies to stock the Cape Drakon depot. A few hours of twilight each day and the light of the moon and the aurora enabled the team to continue scientific work, and Norman Linton-Smith, the Australian radio operator and base engineer, and Jamie Miller recorded the voices of seals under the ice for 24 hours.

SLEDGE HAULING

On June 6 David Lewis, Mimi George, Gill Cracknell, and Jannik Schou, returned to the DSE from a 120km reconnaissance of the sea ice route south of the Rauer Islands which took them seven days of sledge hauling and walking, mostly in company. The ice was more than half a metre thick.

Ice cliffs and glacier tongues with rare rock bluffs marked the coastal route. The party camped by the Chaos Glacier bluffs and made a one-day reconnaissance to the Ranvik Glacier Tongue 25km south of Cape Drakon. Gill Cracknell was able to collect lichens and mosses from normally unapproachable bluffs.

Another depot laying trip was made to Cape Drakon on June 17. Gill Cracknell led Jannik Schou and Jamie Miller on

the 12km trip which took 7½ hours instead of the three of the previous trip although the sledges carried 115kg, half the previous load. Navigation was difficult because of the darkness, mist, and blowing snow. On the way back in a gale the empty sledges flipped and flattened the party.

Meanwhile Mimi George and David Lewis spent two days in a tent by a seal hole 2km from the ship with a hydrophone. Weddell seals and a Crabeater shared the hole, breaking new ice frequently with scrapes and grunts, and pushing the underwater recording microphone.

WEEK OF SNOW

In the first week of June temperatures dropped down to minus 38deg Celsius. A week of snowfall and warmer weather followed but an accumulation of 20cm of snow on the sea ice made sledge hauling a nightmare. Three hours of mid-winter daylight was used to make snow sculptures in a temperature of minus 9 deg C accompanied by a cold wind. Celebrations ended after dinner with songs to the music of Gill Cracknell's guitar.

Hauling conditions were vastly improved by later gales which cleared the sea ice of much snow and glazed the remainder. The ice in the bay broke out to seaward but the route south to the Rauer Islands was intact.

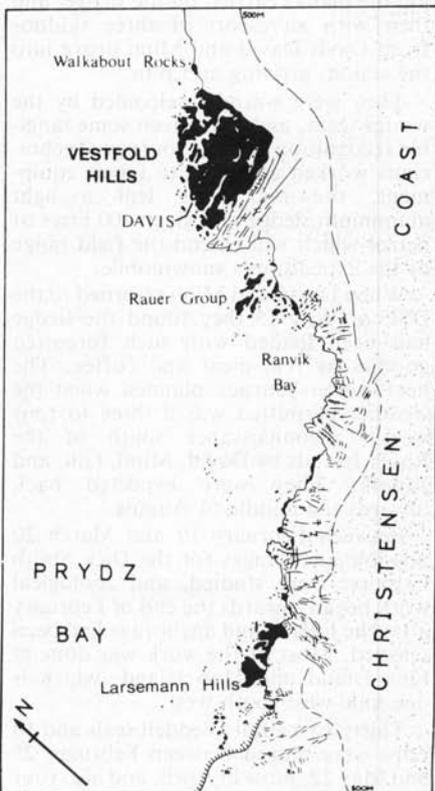
More supplies were sledged to the Cape Drakon depot between June 25 and 29 by Gill, Jannik, Jamie, and Norman, who built an igloo for four while they were there. Before the end of the month the team had to cope with the problem of increasing ice pressure on the Dick Smith Explorer.

As the bay froze thicker it buckled and cracked, tilting the ship 10 degrees to starboard. A precautionary measure was to make all hands available take turns digging to check that the propeller and rudder were clear, and then cutting a trench along the port side to ease the ice pressure. Digging continued daily and polystyrene sheets were placed over the trench to retard refreezing.

From July 5 to 7 Mimi and David camped on the northernmost Rauer

islet. They made a reconnaissance of the unstable sea ice fronting the Sorsdal Glacier. Gill and Jamie continued investigations of the glacier from July 10 to 12. They took water sample temperatures from the thinly frozen breakout line in an attempt to ascertain the causes of the glacier's notorious instability.

Then on July 13 Mimi and David became the first to cross the ice from the



Rauer Islands to Davis. They set out at 2 p.m. on the little Yamaha snowmobile towing the party's heavy Eskimo sledge as a gift to Davis. Mimi's contact lenses popped out of her glasses when the snowmobile had to charge a poorly frozen lead but she was able to drive all the way without them.

Although the sun had half risen at 2 p.m. driving past the tip of the Sorsdal

Glacier at 3.15 p.m. was a nerve-racking experience for both Mimi and David. The little snowmobile had to pass between 41m-high tottering ice cliffs above to the right and shattered poorly frozen floes to seaward.

In the gathering darkness of the late afternoon David and Mimi were delighted to see figures waving from Kazak Island, the southernmost of the Vestfolds. One last lead was crossed using the planks carried on the sledge, and then with an escort of three skidoos from Davis David and Mimi drove into the staion, arriving at 5 p.m.

They were warmly welcomed by the winter team, and were given some tangible recognition of their journey. Technicians worked all hours to repair equipment, the two were lent a light aluminium sledge and given 400 litres of petrol which will extend the field range of the expedition's snowmobile.

When David and Mimi returned to the DSE on July 15 they found the sledge had been loaded with such forgotten goodies as real meat and coffee. The next winter journey planned when the weather permitted was a three to four weeks' reconnaissance south of the Rauer Islands by David, Mimi, Gill, and Jannik. They were expected back towards the middle of August.

Between February 19 and March 20 possible anchorages for the Dick Smith Explorer were studied, and zoological work began towards the end of February after the Filla Island anchorage had been selected. Most of the work was done at Filla Island and Hop Island, which is one mile west-south-west.

Thirty-two adult Weddell seals and 10 pups were tagged between February 25 and May 22, most in April, and also four immature Crabeaters. Ten fish were caught in March with lines and three in traps at depths of 10m. Lines were used thereafter and catches were 31 in April, 54 in May, and four in June in deep water by an iceberg.

Lichens and mosses were collected from the mainland through the seaward islands of the Rauers and at a bluff near Chaos Glacier. Ten of the 41 samples came from the Chaos Glacier area.

Flocks of up to 100 Antarctic petrels were seen in the Rauers at the beginning of May. Thirty non-breeding Giant petrels were observed twice on Hop Island late in February, and an Emperor penguin was sighted off the Rauers on May 4.

Phytoplankton sampling has been done in 18m of water near the ship since April. Earlier two seabottom samples were taken in the Larsemann Hills area at 30 fathoms, and off Stiennes, the rock point east-north-east at 40 fathoms. They yielded very small quantities of sediment.

Vostok still coldest

Vostok, the Soviet station on the Polar Plateau, still retains the title of the coldest place on Earth. A temperature of minus 89.6 deg Celsius (minus 129.2 deg Fahrenheit) was recorded at the station on July 21. This made Vostok, which is 3490m above sea level, 1.3 deg colder than it was on August 24, 1960, when a temperature of minus 88.3 deg C (minus 126.9 deg F) was recorded.

An American station, Plateau, in Queen Maud Land, which was closed in 1969, holds second place on the scale of cold. A temperature of minus 86.16 deg C (minus 123.1 deg F) was recorded there on July 20, 1968.

Third place on the scale is held by the Amundsen-Scott South Pole Station. A record low temperature of minus 82.7 deg C (116.86 F) was measured there on June 23 last year. It was the lowest figure since the station was established in 1957.

This year the South Pole temperatures dropped in July. For most of the month they were normal for the winter — about minus 73.3 deg Celsius. On July 15 a temperature of minus 74.8 deg C was reported, and on July 17 there was a heat wave — of sorts. The temperature rose to minus 50.7 deg C.



Automatic weather stations south of Casey

Three improved automatic weather stations will be established inland from the Australian station Casey next year. Data from these stations will provide a climatic record from the interior of Australia's Antarctic territory, and will be used by the Antarctic Division's glaciological section for a study of surface katabatic winds.

A prototype station designed and built by the division's instrumentation section was established in December, 1981, at 68 deg 39min S/60deg 33min E — a site 130km south of Mawson Station and at an elevation of 1800m. Since then it has successfully provided meteorological data for more than 17 months.

Measurements of surface meteorological data, including air and snow temperatures, atmospheric pressure, and wind speed and direction, are made continuously by the station. This data is transmitted by the ARGOS data collection system on board NOAA (National Oceanic and Atmospheric Administration) satellites to a centre in France from

where it is relayed to the Antarctic Division. Wind data was not available for the whole of last year because extreme weather conditions caused intermittent faults and eventual failure of the wind sensors which were replaced early this year.

Next year the three improved stations will be established during the 1984 glaciological traverse from Casey along 110 deg E longitude at approximately 74deg S (3200m elevation), 70deg S (2400m) and at 68deg S (1600m). These stations will be powered by lithium cells supplemented by silicon solar cells.

Batteries in use at the prototype station — potassium air depolarised cells — are expected to provide power for more than five years. They are buried several metres in snow to insulate them from periods of extreme cold but winter temperatures approach the lower limit at which they will operate. The mean air temperature for 1982 at the elevated site was minus 30.2 deg Celsius.

Uemura abandons ascent of Vinson Massif

After a winter at the Argentine base, General San Martin, in Marguerite Bay, on the Antarctic Peninsula, the Japanese climber and explorer, Naomi Uemura, abandoned his plan to climb the Vinson Massif (4897) the highest peak in Antarctica, in December last year. He intended to make a solo journey by dog team to the northern Sentinel Range of the Ellsworth Mountains, make the ascent which would have been the third since 1966, and complete a round trip of about 3000km early last month.

In return for Argentine support Uemura intended to make scientific investigations of meteorological conditions in Ellsworth Land. However, his programme was delayed because the portable data platform he needed to maintain satellite communication was at

the Argentine Air Force station Vicecomodoro Marambio, on Seymour Island.

Then Uemura gave up the idea of using dogs for the whole journey. Arrangements were made for Argentine Air Force Twin Otter to fly from Marambio to San Martin, pick up Uemura Massif, and then pick him up again after he had completed the ascent.

Arrangements for the provision of fuel at the United States Siple Station in Ellsworth Land to enable the Twin Otter to refuel on the long flight from Marambio to San Martin caused further delays. Uemura intended to make the climb between December 13 and 18; by the end of the month he was reported to be on his way home.

BAS NEWS

Winter cruise to study krill and seals

A winter cruise by the Royal Research Ship John Biscoe as part of the long-term Offshore Biological Programme (OBP) and a joint geological/geophysical project extending south of the Ellsworth Mountains with United States scientists are included in the British Antarctic Survey research programme for 1983-84. In the field the summer season is likely to be the most ambitious ever undertaken because an increase in the annual budget for 1983-84 from about six million sterling to 10 million will enable the level of research activity to be increased.

Scientific work which was resumed on South Georgia last season will be continued this season but only at the small biological station on Bird Island at the north-western extremity of the island. The BAS station at Grytviken, manned by servicemen since the Falklands conflict will not be reopened this coming summer. Servicemen will continue to maintain the meteorological records.

OBP work by the John Biscoe began in the last week of July. This is the first time that a BAS ship has been south during the winter, though the RRS Discovery II, circumnavigated the continent in the winter of 1932. (This was only the fourth circumnavigation and the first ever in winter.)

On June 21 the John Biscoe sailed from Southampton, and then on to South Georgia by way of Rio de Janeiro. Grytviken was reached on July 24 and OBP work started two days later in Cumberland East and West Bays. Unfortunately, heavy weather prevented sea trials of equipment on the voyage south, and many problems were encountered when work began.

In spite of the bad start, the voyage is expected to be scientifically very productive. The first part will consist of a South Georgia zone survey, including oceanographic stations and an acoustic survey of krill, and the second part will concentrate on individual krill patches.

Fourteen scientists are participating and most will fly home when the OBP work is completed in mid-October. The remaining biologists will then carry out a

six-week programme on Weddell seals and ice-associated ecosystems at the edge of the Weddell Sea pack ice. After this, the ship will be engaged in relieving the Antarctic Peninsula stations and supporting field parties.

RRS Bransfield is due to sail from Southampton at the beginning of November. She will be primarily concerned with the relief of Bird Island (South Georgia), Signy (South Orkney Islands) and Halley (Brunt Ice Shelf) stations.

PLANE REBUILT

One of the two Twin Otter aircraft wrecked in a storm at Rothera in November, 1981, has now been rebuilt and test-flown in Britain. It will operate in the Antarctic with the other two BAS aircraft in the 1983-84 summer. A second aircraft, wrecked at the same time, may also be rebuilt. The three aircraft available will be in constant use throughout the summer.

As usual the aircraft will be based at Rothera. Two of them will be used throughout December and January in a joint geological/geophysical project

with United States scientists extending south from the Ellsworth Mountains. Four BAS men and four from Lamont-Doherty Geological Observatory, Columbia University, will continue work in the Ellsworth Mountains and then travel south to the Thiel Mountains (lat. 86°S).

While working on the intervening rock exposures they will be based in the Martin Hills. Fuel was flown into the area by United States Navy Hercules aircraft last season. One BAS aircraft will support the field parties while the other will vary out aeromagnetics and ice-depth sounding in the same area. The field parties will also work at Mt Smart and near Siple Station.

Throughout the summer, other parties will continue work on the Ronne Ice Shelf. Four geophysicists will take seismic and gravity measurements in the southern part, and a glaciological group will work on ice dynamics in the south-central part.

MAPPING WORK

Geologists will also work in north-western Palmer Land, south-east Graham Land, and eastern and central Alexander Island, and glaciologists on the George VI Ice Shelf. Others will carry out a series of landings on the west coast of the Antarctic Peninsula and off-lying islands, filling in gaps in the geological maps.

Biological work continues at Bird Island and Signy, and observatory geophysics at Faraday (Argentine Islands) and Halley. Programmes at Halley will be transferred from the old station to the new one built last summer. This will be done while the Bransfield is at the sta-

tion from late December to mid-February and can provide plenty of manpower to move heavy equipment.

Fitting-out of the new Halley station has continued during the winter. It was visited by parties from the old station (14km away) and some had to stay longer than intended because of strong winds. A number of Halley men also visited the nearby Emperor penguin rookery, and estimated that about 20,000 birds were present.

Strong winds accompanied by above average temperatures have affected the other BAS stations. At Rothera, strong winds up to 70 knots and temperatures up to 3.5 deg Celsius have prevented consolidation of the sea ice and removed it intermittently. This has confined travel to Adelaide Island, and effort has been concentrated on preparing equipment and facilities for the summer programmes.

Local activities have included the twice-yearly ritual of digging out and raising the flight control caboose (mobile hut) at the piedmont airstrip. Dog teams have been used for transport as well as snowmobiles.

Signy Station recorded its second highest winter temperature of 8 deg C in July (exceeded only by 11.1 deg measured in 1981), and Bird Island has had a considerably amount of rain rather than the usual winter snow, which has made the biologists' work considerably more unpleasant. Visits by helicopters from ships of the Falkland Islands naval group en route to and from Grytviken, have provided a welcome diversion from routine at Bird Island.

Joint Services expedition to Brabant Island

A British Joint Services expedition will work on Brabant Island, the largest unexplored island in Antarctica, off the west coast of the Antarctic Peninsula, from November, 1983 to March, 1985. The expedition plans to make a general scientific survey of the island, collecting data and specimens for research groups and climbing the peaks. It will also do physiological research for the Institute of Naval Medicine.

Leader of the expedition is Commander Chris Furse, R.N. He was deputy leader of a services expedition to the Elephant Island group in 1970-71, and leader of a second expedition to the group in 1976-77.

Eight men will be on the island at any one time. The first summer party of eight men is likely to winter and some will stay on for the second summer. There will be at least one civilian member — a research student geologist from Nottingham University.

Brabant Island (65 deg 15 min S/62 deg 20 min W) lies off the west coast of the Antarctic Peninsula immediately north-east of Anvers Island (where the United States Palmer Station is situated) and nearby Wiencke Island (where the British station Port Lockroy was established in 1944 and Damoy summer air facility in 1975). Brabant is about 60km from north to south and 12-20km from east to west. It is very mountainous (rising to over 2500m) and almost entirely covered by ice.

In 1898 de Gerlache's Belgian Antarctic expedition made the first landing on the island. De Gerlache, Amundsen, Arctowski, Cook and Danco spent six nights ashore, in the first recorded tent in Antarctica. (Later, the Belgica was beset in the Bellingshausen Sea and the

expedition became the first to winter within the Antarctic Circle.)

Although Brabant Island lies on one of the established sea routes south along the coast of the Antarctic Peninsula, the island is so precipitous and inhospitable that only three parties appear to have landed there since 1898, and no-one has camped on it. It has been mapped in detail using Falkland Islands Dependencies Aerial Survey Expedition (1956-57) photography and triangulation and BAS (formerly Falkland Islands Dependencies Survey) triangulation, but it remains the largest unexplored island in Antarctica. Virtually nothing is known of its interior, so any scientific information would be of great interest.

Footnote: Brabant Island's highest peak is Mt Parry (2520m). It was named by Captain Henry Foster, R.N., when H.M.S. Chanticleer visited the island in 1829. De Gerlache named the island for the Belgian province of Brabant in recognition of the support given by its citizens to his 1897-99 expedition.

India becomes 28th treaty member

India, which has sent two expeditions to Antarctica since 1981, has acceded to the Antarctic Treaty and intends to seek consultative status. The country's accession last month brings the treaty membership to 28. Of these 14 are consultative members and 14 acceding members.

Earlier this year Dr S. Z. Quasim, Secretary of the Department of Ocean Development, who led the first expedition to Queen Maud Land in 1981-82, said that India planned to continue its annual expeditions until 1985. By then a permanent station would be built in Queen Maud land and manned all the year round. Planning for the third expedition this summer is now in progress.

Although the first expedition code-named Operation Gangotri spent only

10 days on the continent scientists aboard the chartered Norwegian research ship Polar Circle carried out a wide range of oceanographic studies in the Southern Ocean and in the Indian Ocean. A base camp was built on the Prince Olav Coast at 69deg 59 min S/11 deg 07min E, a solar-powered unmanned weather station named Dakshin Gangotri was established 80km to the south, and scientists conducted meteorological, geological, and biological research.

Operation Gangotri cost about \$US2.1 million. Last season India spent \$US3.5 million on Operation Gangotri II which retrieved data from the weather station, erected two huts at the site, and marked out a 3048m runway on the ice with powder dyes to define its limits.

ANTARKTIS II

West Germany's ice shelf project

West Germany will send one expedition to Antarctic this season. The research and supply ship *Polarstern* will work in Bransfield Strait, and the Scotia and Weddell Seas. It will supply Georg von Neumayer Station in Atka Bay, and will take part in the Filchner Ice Shelf glaciological project which will be based at Filchner Station on the Filchner-Ronne Ice Shelf.

This season the Antarktis II expedition will evaluate two fixed-wing ski-equipped aircraft in operations from ice runways at George von Neumayer and Filchner Stations. One is a Dornier 128-6 twin-engined utility transport known as the Sky Train.

A short takeoff and landing aircraft the Dornier 128-6 is a high-wing aircraft with a crew of two and accommodation for eight passengers. It has a range of 642km. Dornier's second aircraft to be tested in Antarctic conditions is a twin-engined turboprop mixed cargo-passenger aircraft. The Dornier 228-100 is also a high-wing aircraft which carries 15 passengers and a crew of two. It has a range of 1970km.

On her second Antarctic cruise the *Polarstern* will leave Bremerhaven this month and will return early in April. Her cruise has been divided into seven legs for different research projects.

Before the *Polarstern* reaches Atka Bay early in January scientists will do biological and geological research, and air chemistry and oceanographic surveys in the Scotia Sea, Bransfield Strait, and the eastern Weddell Sea. The ship will use Punta Arenas and Ushuaia for refuelling and other purposes.

Late in December the *Polarstern* will sail from Punta Arenas for Atka Bay. There she will resupply Georg von Neumayer Station and exchange winter teams. In January she will sail for Filchner Station, the summer station established on the Filchner-Ronne Ice Shelf in January last year at 77deg 09min S/50deg 38min W.

Supplies and the two Dornier aircraft will be landed at the station, and then

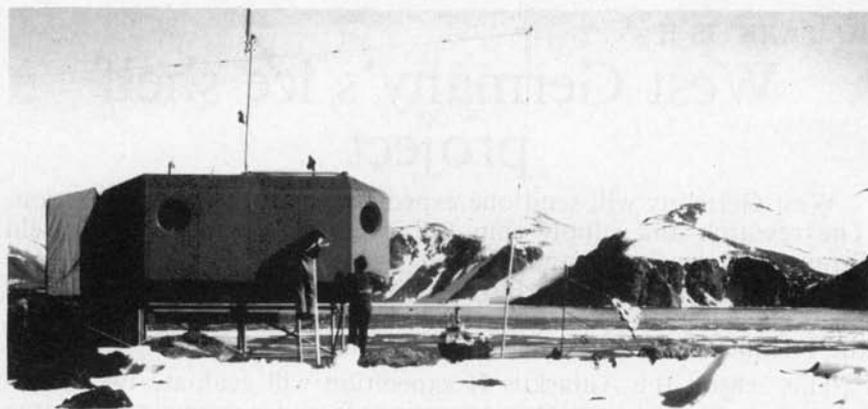
the *Polarstern* will take part in the Filchner Ice Shelf Project, using her two helicopters. Later she will cruise in the southern Weddell Sea where scientists will carry out geophysical, meteorological, biological, and oceanographic projects.

About 20 scientists will take part in the Filchner Ice Shelf Project. The programme includes mapping the shelf and studying the ice dynamics. Other fields of study will be geodesy, geophysics, glaciology, photogrammetry, and meteorology.

Towards the end of February the *Polarstern* will return to Atka Bay. She will leave Antarctic waters for Cape Town early in March, and is expected back in Bremerhaven about April 5.

Support for the West German programme this season will be given by the Chileans. In joint projects West German scientists will be flown from Punta Arenas to Rodolfo Marsh Station on King George Island in the South Shetlands, and also transported by ship. The two Dornier aircraft will be supplied with fuel at Punta Arenas and Rodolfo Marsh.

In less than three years West Germany has established four stations in Antarctica. The first was the Lillie Marleen Hut in Northern Victoria Land. It was placed at the foot of Mt Dockery in the Everett Range by the GANOVEX I expedition



Gondwana Station, established during the GANOVEX III expedition in January this year, is the youngest of the four West German stations. It is at the foot of Mt Melbourne in Gerlache Inlet, Terra Nova Bay, at 74deg 38min S/164deg 13min E.

Photo: Greg Mortimer

of the Federal Institute for Geosciences and Resources (BGR) in January, 1980.

In February, 1981 the first permanent station was opened. Georg von Neumayer Station in Atka Bay was established by the Alfred Wegener Institute for Polar Research at 70deg 37min S/08deg 22min W.

Filchner Station 1450km from Atka Bay was opened in January, 1982 as the headquarters for summer programmes. It was established by the Alfred Wegener Institute.

Unlike George von Neumayer Station the Filchner station is not built into the ice but on top of it. Containers with living quarters for 12, a snow melting plant, and a power station, are set on a platform placed on 14 pillars 1.5m above ice level to avoid snow drifting.

A third summer station called Gondwana was established in January this year by the BGR GANOVEX III expedition. It is in Gerlache Inlet, Terra Nova Bay, near Mt Melbourne, at 74deg 38 minS/164deg 13 min E. Besides a hut similar to the Lillie Marleen Hut there are three other buildings, one for food storage, one for equipment, and the third for a power station, workshop, and snow melting facilities.

Gondwana Station is accessible by ship and aircraft. Runways can be laid out on the sea ice in front of the station or in the nearby Browning Pass area.

In 1984-85 the station will be used for the first time during an aero-magnetic survey by BGR scientists. This geophysical and geological survey will be part of a tripartite programme by the United States, New Zealand, and West Germany.

Mawson diaries

Publication of the diaries of Sir Douglas mawson held in the Mawson Institute at the University of Adelaide is expected later this year. Editing of the diaries is likely to be completed by August.

A research assistant has been appointed to assist the director of the institute, Dr Fred Jacka, with the editing of the diaries. The transcription was completed some time ago. An archivist has been appointed for 12 months to completing cataloguing of Mawson's papers, a task halted several years ago because of lack of funds.

Soviet ships circumnavigate Antarctica

Two Soviet naval hydrographic research ships, the Admiral Vladimirsky and the Thaddei Bellingshausen completed a circumnavigation of Antarctica last season. They left the naval base of Sebastopol in December last year and followed roughly the routes of Bellingshausen's two ships, Vostok and Mirny which circumnavigated the continent in 1819-20.

One project in which the ships were engaged was to determine the exact position of the South Magnetic Pole off the Adelie Coast. On February 9 the Admiral Vladimirsky made an unexpected and unannounced visit to McMurdo Sound where she stayed nearly three hours.

Three research ships took part in a programme of oceanographic studies last season, focusing on the Antarctic circumpolar current and its interaction with the Antarctic Polar Front. After relieving Bellingshausen on King George Island in the South Shetlands the Professor Zubov operated mainly in the Argentine Basin to the north of the Scotia Ridge which the Russians call the South Antillean Arc.

A second ship, the Akademik Mstislav Keldysh, worked in the area where the Atlantic-Indian Ridge, which the Russians call the African-Antarctic Ridge, joins the South-west Indian Ridge (around 50 deg S/30 deg E). The third ship, the Dmitri Mendeleyev, focused on the area south-west of the Campbell Plateau where the South-east Indian Ridge and the Pacific-Antarctic Ridge converge north of the Balleny Islands. She called at the New Zealand port of Dunedin early in February.

Eight ships including the Professor Zubov, took part in the operations of the 28th Soviet Antarctic Expedition (SAE-28). There were some errors in the report in the June issue of "Antarctic", which was based on early information about proposed ship movements.

Some 57 expedition members, including the leader, Nikolay Kornilov, travelled part of the way south aboard the Professor Viz, making her 11th trip, and were transferred to the Kapitán Markov at a point 190 nautical miles from Mirny. The Kapitán Markov then proceeded to Mirny. She spent about three weeks off the station in resupply operations that were hampered by ice movements and bad weather.

After the transfer of passengers the Professor Vize sailed to the Kerguelen Islands where she met the passenger ship Bashkiriya at Port-aux-Francais. There she took on expedition members who had travelled from Leningrad aboard the Bashkiriya.

From Port-aux-Francais the Professor Vize proceeded to Mirny and then to Prydz Bay. There she took part in the establishment of the new seasonal base Soyuz at Beaver Lake near the Amery Ice Shelf. Then she travelled to Maputo, Mozambique, for resupply.

In regular seasonal operation in the Weddell Sea the cargo ships Kapitán Myshevskiy and Pavel Korchagan, both newcomers to Antarctica, reactivated Druzhnaya I on the Filchner Ice Shelf at 78 deg S, and Druzhnaya II (75 deg S) at the base of the Antarctic Peninsula on the Ronne Ice Shelf. These stations were closed for the winter after two months' operation.

Winter staff for the permanent stations were transported by Ilyushin-18 aircraft from Maputo to Molodezhnaya, and aboard the Mikhail Somov, which sailed from the Soviet Union early in February with scientists and support staff for four stations, including Leningradskaya on the Oates Coast. Last of eight ships in SAE-28 was the tanker BAM, one of the Finnish-built Samotlor class of 12,000 — tonne tankers which took a cargo of oil products from the Black Sea refining centre of Batum.

Brazil to build summer station

Brazil which sent two expeditions to Antarctica last season plans to establish a permanent station, possibly on the Princess Martha Coast of Queen Maud Land, but not for several seasons. This season a summer station will be built in the Antarctic Peninsula Area.

A contract for the construction of a modular station by December 5 at a cost of about \$US240,000 was signed in Brasilia last month. The contract is between the Ministry of the Navy and a Brazilian company which manufactures railway equipment.

No indication of where the summer station will be sited has been given in

Brazilian reports. But there have been suggestions that it will be on the Weddell Sea coast. Last season the Barao de Teffe, formerly the Thala Dan, called at stations in the Antarctic Peninsula area and then worked in the Weddell Sea and off the Princess Martha Coast. Her last call was to the West German station, Georg von Neumayer in Atka Bay.

Brazil's second expedition last season used the research vessel Professor W. Besnard. A biological oceanographic research programme was carried out in Bransfield Strait by scientists from the Institute of Oceanography, University of Sao Paulo.

Shirase's maiden voyage to Syowa

A glaciological traverse from Mizuho Station 300km south-east of Syowa Station to 75deg S/35deg E will be made this season by members of the 24th Japanese Antarctic Research Expedition (JARE-24). The traverse will be carried out from November to January, and a temporary camp will be established at the terminal site. By 1988 a third permanent research station will be built there.

This year the new 11,647-tonne research and supply icebreaking ship Shirase, commanded by Captain Tomat-

su Sato, will make her maiden voyage to Antarctica with members of the summer and winter parties of JARE-25. She will be south of 55deg between early December and early March.

Japan's research programme will begin officially on November 14 when the Shirase will sail from Tokyo for Fremantle where she is due on November 28. From Fremantle she will sail for Syowa Station where she is due at the end of December.

U.S. inspection of 14 stations

No activities contrary to the letter or the spirit of the Antarctic Treaty were encountered by a United States inspection team which visited 14 Antarctic stations of eight other nations last season. The team, led by Dr Albert S. Chapman, of the State Department, included Mr Ronald A. Gaiduk (State Department), Commander Maria Kazanowska, U.S. Navy, and Colonel John A. Raymond, U.S. Army.

During its 48-day cruise aboard the United States Coast Guard icebreaker Polar Star the team conducted inspections in accordance with Article VII of the Antarctic Treaty. The stations were: Leningradskaya, Mirny, Molodezhnaya,

Novolazarevskaya (Soviet Union), Casey, Mawson, Davis (Australia), Dumont d'Urville (France), Syowa (Japan), Sanae (South Africa), Georg von Neumayer (West Germany), Halley (Britain), General Belgrano II and Vicecomodoro Marambio (Argentina).

When the Polar Star reached Palmer Station on March 7 she completed her 69-day westward circumnavigation cruise round the Antarctic Continent. The cruise began when she arrived at Palmer Station on December 24, 1982. She sailed for McMurdo Station on December 28, and began the westward circumnavigation when she departed on January 21, 1983.

Hang gliding French yachtsmen

A French yachtsman, Jerome Poncet, and his Australia-born wife, Sally, who left the New Zealand port of Lyttelton for the Antarctic Peninsula on December 13 last year in their 15m schooner-rigged yacht *Damien II*, made their landfall at Anvers Island on January 16 after 26 days at sea from the Chatham Islands. Also aboard were their two children, four-year-old Dion and Liev, who is 1½, Tina Troup, of Christchurch, and a Breton sailor, Patrick Cudennec.

After their arrival at the United States Palmer Station on Anvers Island the Poncets took two scientists from the station to Cape Monaco, the south-west tip of the island. Then the *Damien II* took a zig-zag course southwards. Island groups were investigated for the presence of Chinstrap, Adelie, and Gentoo penguins, cormorants, and other bird colonies. Bird counts were made for the International Survey of Antarctic Seabirds (ISAS).

On February 8 the *Damien II* reached Avian Island at the southern tip of Adelaide Island and at the entrance to Marguerite Bay. This was the island where the Poncets were based in 1978 for more than a year. It has a rookery of 80,000 Adelie penguins and many nesting birds.

From Avian Island the *Damien II*, with the crew still bird spotting, headed for the British Antarctica Survey base Rothera on Adelaide Island. There the crew encountered again the French yacht *Graham*, which was also cruising in the Antarctic Peninsula region.

Last season was particularly good for navigation in Marguerite Bay as there was considerably less sea ice. Both yachts therefore headed together for Horseshoe Island where the crews spent a week. They climbed peaks on Pourquoi Island, skied, and Jerome Poncet made two flights with his hang glider on Horseshoe Island.

Two peaks, Mt Verne (1645m) in southern part of Pourquoi Pas Island, and Mt Arronax (1585m) in the northern

part, were climbed. Patrick Cudennec and Christian de Morliave and Michel Franco climbed Mt Verne, and Philippe Cardis and Luc Frejus made the ascent of Mt Arronax on skis. Jerome Poncet and Tina Troup crossed Horseshoe Island on skis. It has peaks rising from 600m to 900m.

From Horseshoe Island the *Damien II* and the *Graham* sailed south together. They stopped at the Argentine base, General San Martin. There Jerome Poncet, Olivier Carre, Christian de Morliave and Tina Troup climbed the low peak of Millerand Island on skis.

Neny Fiord produced some of the gustiest weather the yachts had encountered in a summer that was predominantly calm and sunny. The two moored under Red Rock Ridge (690m) between Neny Fiord and Rymill Bay. Patrick Cudennec and Christian de Morliave remained there to make a rock climb.

Then the rest of the two crews sailed to an area of fast ice between the Refuge Islands on the south-west side of Red Rock Ridge and the coast. This provided an excellent runway for Michel Franco's two-seater motorised glider, and he was able to give everyone a flight.

Beyond this point the two yachts parted company. *Damien II* tried unsuccessfully to reach Alexander Island to the south-west but turned back on the second day when the pack ice became heavier and the weather showed signs of deteriorating.

By February 27 the *Damien II* was back at Avian Island. Once the weather settled the yacht continued its 900km voyage north in stages up the coast with the crew still spotting new bird colonies.

From the South Shetlands the *Damien* headed north to the Falkland Islands. The Poncet family sailed *Damien II* from Port Stanley to Montevideo for the winter. In September parents and children will go south again to spend the summer in the Antarctic Peninsula area and at South Georgia.

THE READER WRITES

DISCOVERY HUT

Sir,

I read with disbelief ("Antarctic", June, 1983) that it has been seriously suggested that a plastic geodesic dome be erected over the Discovery hut at Hut Point. That the suggestions has its source from a staff member of the National Museum, an institution one would expect to be aware of historic sensitivity, seems astounding. Such an aberration would destroy all of the historic atmosphere of the site as well as placing the building at considerable risk.

Such a dome would reduce the available light and artificial lighting would be then required. There is no form of illumination that I am aware of that does not produce heat. Any raising of the temperature within this and the other huts would constitute a much greater threat to the contents than any raised by Mr Fry.

It would also increase the fire risk and destroy completely the genuine and very special air of history that most visitors feel when they enter such places.

I am amazed that it should now be considered necessary to "tidy up", and light the building when it never was so in its 80-odd years of survival through polar history. As a member of the four-man team that restored the hut in 1964 I can say with firm conviction, that it is as it has always been since the Aurora party departed in 1917, untidy, dirty and dimly lit. In the good name of historic authenticity, may it long be allowed to remain so.

The greatest threat to Hut Point comes from the presence of men. A road running close to the building places it at risk from falling equipment or vibration from heavy machines. The fuel tanks on its back door can only be viewed with trepidation. A dome would not be of any earthly use should these fears ever be realised.

I believe the hut is at threat from the over-attention of "experts". Such people

swore that the building would collapse when we removed the ice from inside, then when proved wrong, wanted to demolish the building and re-erect it on the roof of the Canterbury Museum.

Now they want to interfere with its contents and create a tidy, clean and brightly lit artificial monstrosity that would convey nothing of its genuine interior environment. Experts? Yours etc.

BADEN NORRIS

Sir,

I believe that Scott's hut at Hut Point should be preserved by whatever means is necessary. It is one of the best-known landmarks in all of Antarctica, perhaps because it is so visible at McMurdo. When I first saw the hut in 1960, it was nearly filled with snow and ice, the outer walls had a variety of graffiti on them, and the general environs were in disarray. Through the years the New Zealand Antarctic Society and others have done an excellent job in restoring the hut and maintaining it.

There is some merit in leaving the hut to whatever fate the elements might determine, which is a kind of ultra-environmentalist viewpoint. Instead, however, I believe the museum approach is probably the only means of preserving the hut for not only our lifetimes but others as well. A dome similar to the one described in New Zealand Antarctic Record (Vol 4, No. 3, 1983, P. 8) is probably the most feasible way of doing this. The dome design could include a few large sections of clear plexiglas or similar durable material, which, from the inside, would permit aesthetic views of McMurdo Sound, Victoria Land, and the Royal Society Range. Winter Quarters Bay would provide a little more of the historical aspect of the hut, but such a view would also include McMurdo's rubbish dump, unfortunately.

Constructed properly, the inside of the dome could provide the security necessary to display artefacts, memorabilia, maps, etc. of many aspects of polar history on opaque panels of the dome. Forethought should also be given to possible repercussions to the building and permafrost because of the dome's presence. Changes to the permafrost because of the "greenhouse" cover and heat entrapment could affect the integrity of the building as a result of shifts in the foundation.

The dome could be constructed so as to allow for easy dismantling of panels

to allow access on any side by construction equipment or vehicles in the event that major repairs or modifications might become necessary. Some kind of venting apparatus should be included to rid the interior of moisture buildup during peak times of occupancy.

There are numerous details related to the ultimate design and construction of such an enclosure, but the basic concept should be considered seriously as a matter of preserving this important aspect of Antarctic history. Yours etc,

JOHN SPLETTSTOESSER

South Pole ventures postponed

Two private expeditions — one British and one French — which planned to make journeys to the South Pole next year from Cape Evans and the Bay of Whales respectively are reported to have postponed operations for a year. Originally two Englishmen hoped to manhaul sledges to the Pole, and the Frenchmen proposed to reach it with dog teams.

Earlier this year Robert Swan, a 27-year-old-tree surgeon and self-styled professional explorer, and 32-year-old Roger Mear, a professional mountaineering instructor, announced their plan to haul sledges 1365km from Cape Evans to the Pole this summer to recreate Scott's journey in 1911-12. They proposed to fly to McMurdo Sound in a chartered Hercules aircraft on October 25.

Proposals that the chartered aircraft should carry cargo for the Americans on its flight between New Zealand and Antarctica in return for transport of Swan and Mear from the Pole to McMurdo Station by a United States Navy ski-equipped Hercules were not accepted by the United States National Science Foundation. In addition, according to Mear, the Melbourne firm responsible for the Hercules charter "has gone bust".

Now Swan and Mear propose to reach their starting point in Antarctica by sailing a yacht from Britain next year. The

expedition's change in plan was revealed by Mear to a New Zealand journalist in London last month.

In December, 1984, Swan and Mear and six others will leave Britain by yacht. They intend to winter in McMurdo Sound and in a prefabricated hut in preparation for an early start from Cape Evans as soon as conditions permit.

A doctor, an engineer, a cameraman, and a sound technician will be among the crew of the yacht. Only Swan and Mear will take the sledges south in the summer of 1985-86.

No advance depots will be set up along the route and there will be no air support. Swan and Mear will be in radio communication with McMurdo Station and Scott Base.

Twelve French sailors, mountaineers, divers, and skiers, who planned to sail three 16m boats from New Zealand to the Bay of Whales in December, 1984, winter on the Ross Ice Shelf in 1985, and make a summer journey by dog sledge to the Pole are also reported to have delayed their project for a year. The expedition, led by Bertrand Dubois, intended to use 60 dogs, 20 carried in each boat for the Pole journey.



Captain Hedblom: polar medicine authority

A United States authority on cold weather medicine, Captain E. E. Hedblom, who was staff surgeon with the Naval Support Force, Antarctica, from 1955 to 1959, died on November 27 last year in Brunswick, Maine, after a brief illness. New Zealanders who knew Captain Hedblom during the first five years of Operation Deep Freeze remember him as a giant of a man, usually clad in outside overalls with a big red cross on the back, who had a fondness for simple practical jokes and a cheerful disregard for the rules against the consumption of alcohol on United States Navy ships.

During his service with the Department of Cold Weather Medicine, United States Navy Medical School in Bethesda, Maryland, Captain Hedblom was largely responsible for the production of the Antarctic Manual which covered living conditions, clothing, nutrition, supplies, equipment, cold injuries, safety and survival. The revised and rewritten third edition became the widely known Polar Manual.

When Deep Freeze I ended Captain Hedblom wrote a brief set of "Polar Do's and Don'ts" on hygiene and personal safety to assist men going on Deep Freeze II. One of the bluntly written don'ts described what happened to a New Zealand politician visiting Antarctica who disregarded it.

This pamphlet was not published but in manuscript form served as a guide for the first Japanese expedition in 1956-57. A request in 1959 by the Royal Australian

Air Force for information the care of cold weather casualties produced another brief pamphlet. Then in the same year the two pamphlets were updated, condensed and combined to meet a request for medical guidance by the Belgian Antarctic expedition and the first edition of Antarctic Manual was born.

Captain Hedblom edited later editions of the Polar Manual, drawing on the records and observations of United States Navy doctors with polar experience, and the advice of scientists and polar explorers. Some like Sir Hubert Wilkins, Paul-Emile Victor, and Captain Harry Kirkwood, R. N., were friends and shipmates. Others who knew him well included Phillip Law, Bernt Balchen, Vilhjalmur Stefansson, and Dr Bernard Gunn, who was injured in New Zealand's first fatal Antarctic accident when a snowcat went into a crevasse near Cape Selborne in 1959.

After his five summers in Antarctica Captain Hedblom was medical consultant to the Chief of Naval Operations, the Commander, Naval Support Force, Antarctica, and the Arctic Institute of North America. He was also cold weather consultant to the Commandant, U.S. Marine Corps. In 1961 he published the first specific statistics of morbidity over the five years to 1961 of United States winter bases in Antarctica, and United States Navy operations within the Antarctic Circle.

Veteran of BANZARE expedition

One of the veterans of Mawson's last Antarctic research expedition, Dr William Wilson Ingram, died in Sydney on November 25 last year aged 94. He served as medical officer and biologist with the British, Australian, New Zealand Antarctic Research Expedition (BANZARE) on the Discovery's voyages in the 1929-30 and 1930-31 summers.

Dr Ingram was born in Scotland and was a graduate of Aberdeen University. He served in France during the First World War, was wounded, and won the Military Cross. After the war he settled in Australia and for 45 years until 1974 was director of the Kolling Institute of Medical Research which is attached to the Royal North Shore Hospital. Then

he was consultant physician until his retirement in 1979.

Ingram Bay (68deg 35min S/72deg 20min E), an embayment of the ice shelf coast of MacKenzie Bay at the western extremity of the Amery Ice Shelf sighted from the air on February 11, 1931, was named for Dr Ingram. But because of its temporary nature the embayment is not named on Australian maps.



Miss Beatrice Smith, one of the few survivors of the "Mawson Club," died in Christchurch early last year. She belonged to a group of women students at Canterbury University College, now the University of Canterbury, who, during the First World War, completed and tabulated magnetic observations taken in Antarctica by Mr Eric Webb, the New Zealand chief magnetician with

Mawson's Australasian Antarctic Expedition of 1911-1914.

Mr Webb, an associate of the college School of Engineering, who lives in retirement in England, was only 22 when he joined the expedition. When he returned he was swept up almost immediately into the First World War, and as a result of his war service was unable to analyse the results of his observations.

Professor C. C. Farr accepted the job, and, in turn, persuaded 10 of his women physics students to undertake the very detailed work involved. Computers were unheard of in those days, and the students took nearly two years and a half to complete their task, using nearly all their spare time, including the vacations of those who lived in Christchurch.

Mawson later called the group "the magnetic ladies of Canterbury College." When Miss Smith died the original group was reduced to four.

MICROLITES AND COPEPODS

Gold exists on a large scale in the Antarctic. It can be obtained by following the Alaskan experience of thawing out the gravel.

No, the report does not come from "Antarctic Geoscience" and was not written in 1983. The author is the distinguished Australian geologist, Edgeworth David, who was with Shackleton's 1907-09 expedition, and the quotation comes from a lecture he gave to the Royal Institution in Sydney 57 years ago.

* * *

A slightly different view of the future of Antarctica comes from an American writer, John Calvin Batchelor whose book has not attracted the most favourable attention. He is responsible for "The Birth of the People's Republic of Antarctica" published recently by the Dial Press. According to the "New York Times Book Review" of May 29, 1983, the book begins in the known world.

A Swedish-American narrator and here, Grim Fiddle, is the illegitimate product of an encounter in a Stockholm bar

in 1973 between an American draft evader and a local girl. Grim Fiddle "sails ever southward to new reunions and losses and the bloody achievement of power in Antarctica where he wins a kingdom and a dangerous bride, and almost loses his soul. "All this, and South Georgia too, for US\$16.95.

* * *

Pierre Boule, author of "Bridge on the River Kwai," has written an adventure story with humour and suspense called "La Baleine des Malouines" or "The Whale of the Falklands." The hero or rather the principal heroine is a huge good-natured blue whale.

By her presence the whale confirms to the admiral commanding the British fleet on the way to the South Atlantic the warning of the Duke of Edinburgh transmitted by the Admiralty: "Attention Cetaceans often appear on radars like submarines."



Private expedition to restore Mawson's hut

A group of Australian adventurers plans to sail from Hobart to Commonwealth Bay in November next year to restore Mawson's hut, built for his 1911-13 Australasian Antarctic Expedition (AAE). The expedition also proposes to retrace and try to complete Mawson's eastern journey along the coast of King George V Land in 1912-13 when his companions, Lieutenant Belgrave Ninnis and Dr Xavier Mertz, died.

Code-named Project Blizzard the expedition, expected to cost \$A250,000, will be led by William Blunt, an architect, and Dr Ross Vinning, a medical research scientist, both of Sydney. They led a private expedition to Heard Island last summer. Two South Australians, Jonathan Chester, a freelance photographer, and Robert Easther, a teacher, who also went to Heard Island, have joined the co-leaders to prepare for Project Blizzard.

Geologists, physicists, meteorologists, carpenters, and museum experts, will be among the 20 members of the expedition. Most of them will go south in a ship which will take equipment and materials to Commonwealth Bay. The others will sail a yacht — possibly the 13m steel-hulled *Domino* — from Hobart.

When the expedition reaches Commonwealth Bay about December 10 first priority will be the restoration of Mawson's hut, which is expected to take two weeks. The building will be cleared of snow and ice, and the outer planking and damaged framework will be replaced, using material given by the Australian Antarctic Division.

Three men will then attempt to retrace Mawson's journey. They will use motor toboggans instead of dogs, and expect to complete the journey in 28 days.



Ross Dependency birds

Financial and logistic support for research into the distribution, population, and ecology of the birds of the Ross Dependency have been received by the New Zealand committee of the International Survey of Antarctic Seabirds (ISAS). A joint contribution of \$25,000 has been made by B.P. Oil N.Z. Ltd and the Department of Scientific and Industrial Research.

One contributor, B.P., has provided \$14,000 for ISAS projects in the Ross Dependency. The DSIR contribution of \$11,000 represents the cost of logistic support for future research work.

Since the New Zealand ISAS committee was established some 41 per cent of the 34 known Adelie penguin colonies in the Ross Dependency have been surveyed. Two new colonies have been discovered, and several major reports have been prepared.

Recommendations for future ornithological research in the Ross Dependency have been prepared by the committee. These refer in particular to oil exploration/exploitation and krill harvesting, and their effect on seabirds and penguins.

Desmond Bagley, one of the world's top-selling thriller writers, who died in Southampton on April 12, visited McMurdo Station and Scott Base in 1968. He began writing another thriller inspired by his Antarctic visit but since 1979 the book has not been mentioned in the publishing world.

When Bagley was at Scott Base he used two pocket tape recorders to retain his impressions of everything he saw there. He explained later that he used tapes to recall people and places and stimulate his imagination.

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 nations at work in the far south. It has a worldwide circulation.

Yearly subscription NZ\$8.00, Overseas NZ\$9.00, 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.

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\$6.00 (or equivalent local currency). Membership fee, overseas and local, including "Antarctic", NZ\$13.00.

New Zealand Secretary: P.O. Box 1223, Christchurch

Branch Secretaries: Canterbury: P.O. Box 404, Christchurch.
Wellington: P.O. Box 2110, Wellington.

“LOOKING SOUTH”

“Looking South”, published by the New Zealand Antarctic Society to mark its first 50 years, will appear next month. Copies of the book can be ordered and paid for now. Mailing will begin in November–December.

Orders from: Book Project, N.Z. Antarctic Society, P.O. Box 2110, Wellington, N.Z. at NZ\$7.50, post free or Treasurer, N.Z. Antarctic Society, P.O. Box 1223, Christchurch N.Z. Overseas payments should be converted to the equivalent in New Zealand currency.

ANTARCTIC POSTCARDS

A new set of postcards depicting aspects of Antarctica is now available from the New Zealand Antarctic Society. They show Scott Base, Emperor penguins on the sea ice of McMurdo Sound, a New Zealand dog team outside Scott's hut at Cape Evans, and a Scott Base husky.

These cards sell at four for \$1 plus postage. Surface mail postage rates are 30 cents (New Zealand) and 50 cents (overseas).

Orders accompanied by cheque or money order should be addressed to Cards, P.O. Box 1223, Christchurch, New Zealand. Overseas payments should be converted to the equivalent New Zealand currency.

