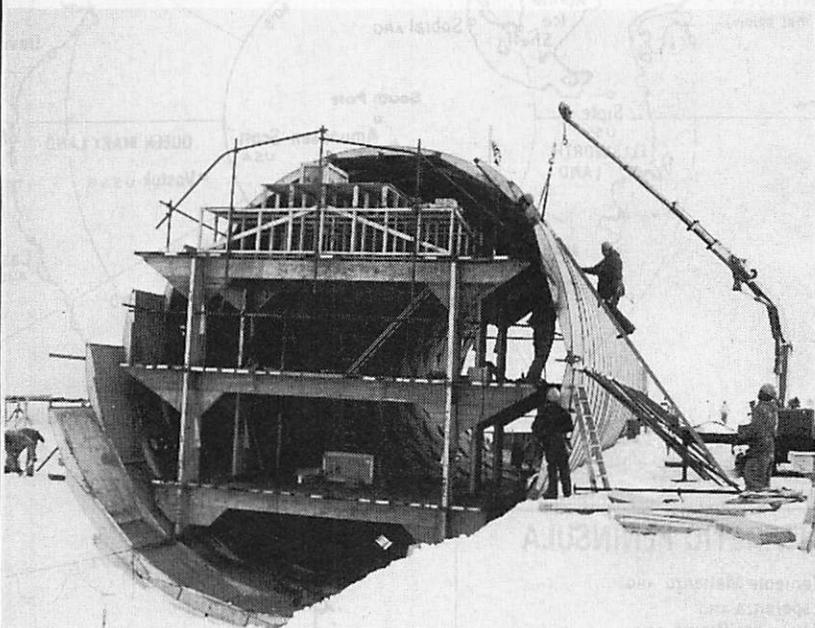


# ANTARCTIC

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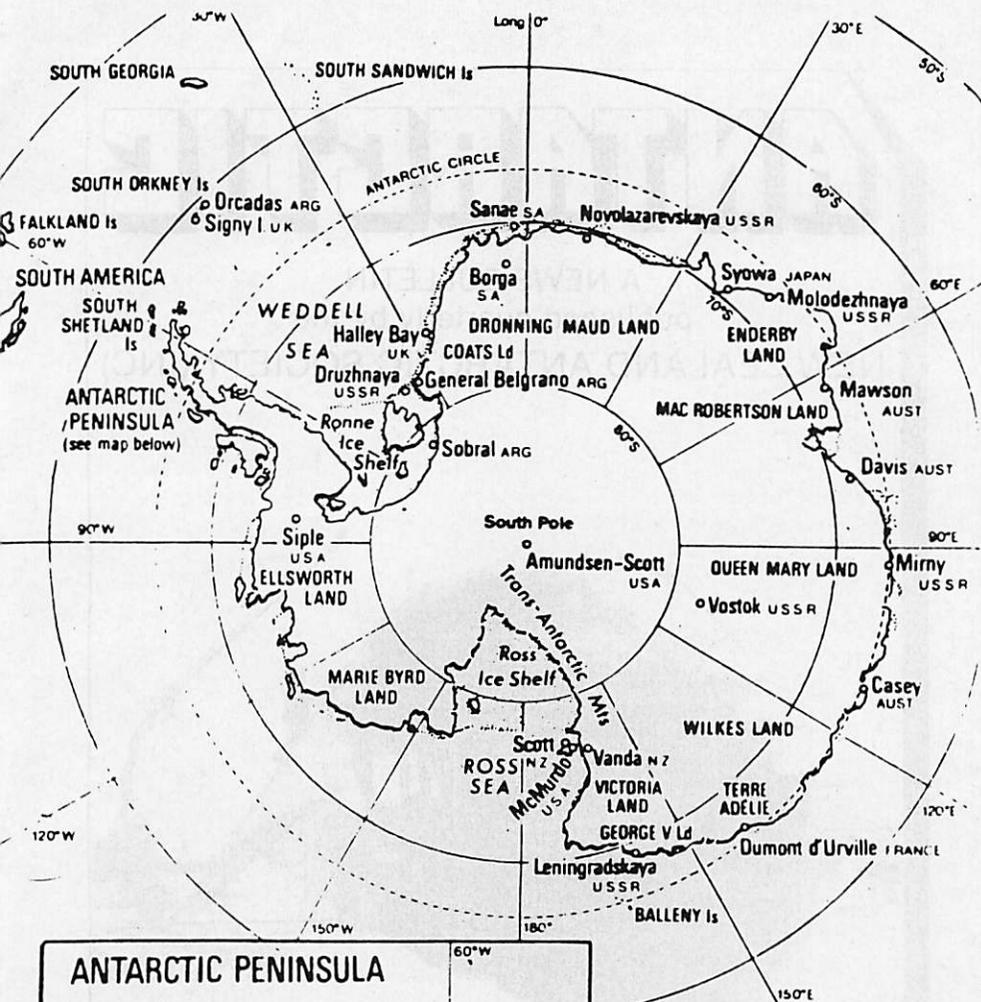
Halley, the British Antarctic Survey's station on the Brunt Ice Shelf, Coats Land, was rebuilt last season for the third time since 1956-57. This picture taken in March shows one of the four wooden tubes, each of which houses a two-storey building, under construction in a pre-shaped and compacted snow hollow.

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**Vol. 10, No. 2**

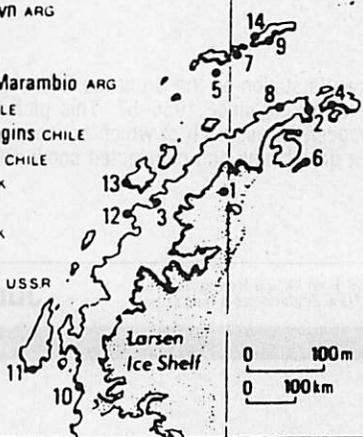
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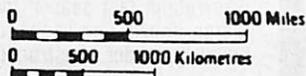


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- 9 Presidente Frei CHILE
- 10 Stonington I. UK
- 11 Adelaide I. UK
- 12 Argentine Is. UK
- 13 Palmer USA
- 14 Bellingshausen USSR



## ANTARCTICA



### ABBREVIATIONS

ARG ARGENTINA  
AUST AUSTRALIA

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

# ANTARCTIC

(successor to 'Antarctic News Bulletin')

**Vol. 10, No. 2. 110th Issue. June, 1983**

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Address all contributions, inquiries etc. to the Editor.

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# Ross Island huts' relics for museum

Twenty relics recovered 26 years ago from the three historic huts built by Scott and Shackleton on Ross Island have now come to the Canterbury Museum's Antarctic Centre. The relics were removed from the huts early in 1957 by Paul-Emile Victor, the noted French Arctic and Antarctic scientist and explorer. Paul-Emile Victor was then head of Expeditions Polaires Francaises, responsible for French scientific programmes in Greenland and Adelie Land. He saw the historic huts when he visited McMurdo Station as the guest of Operation Deep Freeze.

More than nine months ago Paul-Emile Victor's "souvenirs" as they were described in the auctioneers' catalogue, were to have been sold in Paris on October 5 and 6. They were part of the explorer's polar library which included Arctic and Antarctic books, personal manuscripts, autographs, philatelic items, and 220 photographs from the Antarctic expeditions of Jean Charcot in 1901-03 and 1909-10.

Catalogues for the sale were widely circulated, and the listing of items brought back from Mawson's hut in Commonwealth Bay, the main base for his 1911-13 Australasian Antarctic Expedition, which Paul-Emile Victor visited in 1956, caused an uproar in the Australian media. The catalogue listed a tinned plum pudding, 15 pieces of white leather thongs used for dog harness, and five small nails, but newspapers added some of the items from the Discovery hut and claimed that a shaving mug from there had belonged to Mawson.

Questions were asked in the Australian Parliament, demands were made by various people for the return of the Mawson items, and Paul-Emile Victor was alleged to have removed the articles illegally from the hut. Finally the Australian Government instructed its embassy in Paris to ask the auctioneers to withdraw the Mawson items from sale.

In the meantime the New Zealand approach was pitched on a lower key. It

was recognised that when Paul-Emile Victor visited Scott's huts at Hut Point and Cape Evans, and Shackleton's hut at Cape Royds they were not recognised officially as historic sites, and there were no restrictions on the removal of relics. After the Antarctic Treaty came into force in 1961 New Zealand became responsible for the historic huts and other sites in the Ross Dependency. Since then no relics have been removed officially from the huts without the permission of the director of the Antarctic Division, Department of Scientific and Industrial Research.

## RELICS WITHDRAWN

A personal approach was also made to Paul-Emile Victor by Mr J.C Wilson, who retired early this year as director of the Canterbury Museum. In a message to the explorer he suggested that the Antarctic Centre would be the most suitable place to display the relics, and recalled Paul-Emile Victor's knowledge of the museum gained through his visits to Christchurch.

Finally most of the relics were withdrawn from the auction and given by Paul-Emile Victor to the new French National Museum of Science, Technology and Industry which is expected to be opened in 1985. But the museum authorities decided that the Antarctic relics were not entirely suitable for a museum of science and technology.

Eventually the question of where the relics should go was referred to the Scott

Polar Research Institute in Cambridge. It was recommended that as the items had been used by British explorers they should go to British museums. As New Zealand is now responsible under the Antarctic Treaty for historic sites and artefacts in the Ross Dependency the items from the Ross Island huts have come to the Canterbury Museum.

Eleven of the Scott relics are from the hut built at Hut Point for the first expedition (1901-04). Among them are a blue enamel mug, a tin opener, shaving soap in a metal case, a shaving brush, and anti-blizzard goggles. Smaller items are a dozen horseshoe nails, pony oats from a sack in the hut, and a packet of safety matches (one used).

In the 1956-57 season the summer was particularly warm, and the ice which almost completely filled the hut melted, exposing packing cases containing provisions. These included two tins of coffee and a tin of tongue.

Packed in square hermetically sealed metal tins, the coffee was specially prepared for the expedition in 1901 by Tower Tea Ltd. One tin had been opened from the bottom but the coffee was still preserved in a separate package.

In a catalogue note Paul-Emile Victor said some of the coffee was drunk in 1960. The drinkers were himself, Sir Edmund Hillary, and Maurice Herzog, the noted French alpinist who made the first ascent of Mount Annapurna in the Himalaya.

From the hut at Cape Evans Paul-Emile Victor recovered eight relics, among them tins of Bird's baking powder and concentrated egg powder, and pemmican made by J.D. Beauvais, of Copenhagen. Other items included a boot sole and two heel plates, an awl used for sewing dog harness, and a playing card — the five of diamonds.

Only one relic was removed from Shackleton's hut at Cape Royds which was built for his 1908-09 expedition. It was a tin of Liebig's extract of meat, marketed under the brand of Lemco, still in its original wrapping, and carried an inscription in pencil — Royds.

A nail and two matches were relics of Rear-Admiral Byrd's first expedition in 1928-30. They were found on the ice at Little America I where the expedition wintered, and were given to Paul-Emile Victor by his friend, Dr Paul Siple.

## N.Z. research projects for 1984-85

Proposals for research projects to be considered for inclusion in the 1984-85 New Zealand Antarctic Research Programme are invited by the Ross Dependency Research Committee. Research proposals can cover any of the earth, life or atmospheric sciences and be directed to a better understanding of the unique environment of Antarctica, its geological and geophysical structure, or those natural phenomenon most suited to research conducted from southern latitudes.

Research proposals can be either short of long term, and based at New Zealand's Antarctic stations or in the field, depending on the logistic support required. Proposals should include a detailed outline of past research in the topic, biographical notes on team members, an outline of anticipated

work, and details of required logistic support.

Applications, which close on August 31, 1983, are reviewed by the biological, physical or earth sciences working groups of the RDRC. Applicants will be informed of the status of their proposals in late December, 1983.

An information package on research directions, available facilities and how to prepare a proposal is available along with a support information form from:

The Secretary  
R.D.R.C.  
C/o DSIR Head Office  
Private Bag  
WELLINGTON



# Plastic dome to preserve Scott's hut

Enclosure of Scott's Discovery hut at Hut Point within a plastic geodesic dome to prevent its collapse and the deterioration of its artefacts, has been suggested by Mr J. Fry, a National Museum conservator, in an article contributed to the "New Zealand Antarctic Record". Mr Fry worked at the historic huts on Ross Island in the 1981-82 and 1982-83 season to obtain material for a report on the preservation and future management of historic sites, buildings, and artefacts in the Ross Dependency.

On behalf of the Historic Sites Management Committee of the Ross Dependency Research Committee Mr G. Turner, senior planning surveyor of the Lands and Survey Department, and secretary of the committee, and Mr Fry, made a study of conservation problems in the 1981-82 season. They visited Cape Evans, Cape Royds, Hut Point, and Granite Harbour. A party led by Mr D. L. Harrowfield, of the Canterbury Museum, assessed the condition of the buildings on Ridley Beach, Cape Adare, which were put up in 1899 by Borchgrevink's Southern Cross Expedition, and the hut built there by Scott's Northern Party in 1911.

Last season Mr Fry was accompanied by Mr G. Dougherty, of the Chemical Division, Department of Scientific and Industrial Research, who represented the New Zealand Antarctic Society. They worked for three weeks at Cape Royds, Cape Evans, and Hut Point mainly to determine the extent of the conservation problem identified in the previous season.

Permission was given for the team to remove 108 tins of foodstuffs containing acidic materials from the three huts for conservation treatment at the National Museum. Seal blubber at Cape Evans and a heap of seal meat inside the Discovery hut were measured and photographed with a view to producing replicas.

Results of the two seasons' study will be embodied in a report to the Historic

Sites Management Committee. It will cover not only the conservation issues and some of the answers but also historical aspects, and long-term planning concepts to preserve the hut sites and artefacts in the Ross Dependency. These are New Zealand's responsibility under the Antarctic Treaty.

Enclosure of the Discovery hut in another building would solve most of the problems raised by the condition of the hut and its contents, lack of knowledge of its history, of the five expeditions that have used it, and of other expeditions that have set up bases in the Ross Dependency in the past. These points are made in the "Antarctic Record" article.

Mr Fry says that the hut could be illuminated, fitted with fire protection devices, and powered from the nearby pumping station. Between the walls of the hut and its shelter maps, photographs, and artefacts could be displayed. These would relate to the five British expeditions, and these Ross, Amundsen, Shirase, Byrd, and Ellsworth. The space could also have audio-visual equipment, and provide a base for a caretaker-guide during certain periods in the summer.

In this article Mr Fry refers to the effect of windblown pieces of ice and scoria on the hut timbers. He says it is only a matter of time before sufficient timber is removed and the structure starts to collapse. There are indications that the hut is slowly collapsing because

of the wind, snow loading or movement of the permafrost.

Inside the hut there are similar structural problems. Floor and ceiling panels have come loose, and there is a fresh crack in one of the ceiling joists. Continual filling of the hut with snow and ice although every conceivable crack has been sealed, means that clearing almost every year damages the floor and walls.

During the summer the ice melts and the humidity rises, Metals start to corrode and paper objects are softened and stained by the moisture. More damage results when visitors handle objects to study them in the available light from the windows. Tins of liquid foodstuffs have started to leak.

After 81 years the hut is now situated in the middle of McMurdo Station's fuel storage facilities and is near the road leading to the wharf in Winter Quarters Bay. "For a person who knows little of the condition of the hut, its unlabelled contents mean very little. It is dark, dirty, and the objects are in a state of disarray.

### AURORA ANCHOR

Because of bad weather and lack of helicopter support Messrs Fry and Dougherty were unable to complete all the work programme last season. But they were able to study the effects of high winds on the hut and external stores at Cape Royds and spend more time at the three huts. Some of the work done is recorded below.

**Cape Evans:** A complete photographic inventory of the hut contents and items listed in the inventory made by D. L. Harrowfield in 1977-78.

Installed specimens inside and outside the hut to monitor the rate of corrosion for comparison with Australian and New Zealand rates.

Studied chemicals in the hut to determine if they constituted a fire hazard. Sampled petroleum containers for analysis by Chemistry Division, DSIR.

Emptied about half of the Lyle golden syrup tins, washed, dried, and oiled the insides as a temporary protective

measure. Removed all tins of jellies and jams which were prone to leak for conservation treatment.

Located the second Aurora anchor and roughly plotted its position. A more accurate location was fixed by a Lands and Survey Department surveyor, Tony Hawke.

Recorded numbers of visitors during 1981-82 season.

**Cape Royds:** Constant high winds and an overall snow coating inhibited much of the work planned for the exterior of the hut and study of the various supply dumps.

Tinned foodstuffs in Mawson's laboratory were examined and an inventory was prepared to indicate their state of deterioration. Selected tins were removed for conservation treatment.

An inventory was made of tins of feed in the main part of the hut. All tins of acidic foodstuffs were removed for conservation treatment.

**Hut Point:** A complete photographic inventory and a partially written inventory were undertaken. Items listed in Harrowfield's inventory were photographed.

Tinned foodstuffs containing acidic materials were removed for conservation treatment. The contents of fuel cans were studied, and a sample was taken from an unlabelled can for analysis by the Chemistry Division, DSIR.

Studies were made of the condition of the memorial cross to Scott's party on Observation Hill and Vince's cross on Hut Point. Photographs were taken of both.

Records were made of the number of visitors during the 1981-82 season, and visitors to date during the 1982-83 season.



# Antarctic Society's 50th anniversary

Fifty years ago on November 2 the New Zealand Antarctic Society had its beginnings in Wellington. To mark the historic occasion the society will publish "Looking South" an illustrated history of its activities since 1933. In addition it will issue a limited first-day cover on November 2, 1983.

"Looking South" which has been written by Neville Peat, assisted by other members of the society, has a foreword by Sir Vivan Fuchs, former director of the British Antarctic Survey and leader of the Trans-Antarctic Expedition, and an afterword by Sir Holmes Miller, deputy leader of the New Zealand section of the TAE, and now chairman of the Ross Dependency Research Committee. The book tells the story of a society — the second oldest of its kind in the world — which has made a notable contribution to New Zealand's Antarctic interests.

Over the years the society has brought together as members such men as Sir Edmund Hillary, Murray Ellis, John Claydon, and Trevor Hatherton, all involved with the establishment of New Zealand's presence in Antarctica, and veterans of Scott's last expedition, William Burton, now the last survivor, Mortimer McCarthy, and William McDonald. Lesser-known but equally devoted members are the volunteers who, since 1960, have helped to restore and maintain the huts built by Scott and Shackleton on Ross Island.

First-day covers issued by the society will carry a special New Zealand Post Office date stamp. They will be cancelled at Scott Base, New Zealand's scientific station on Ross Island in the Ross Dependency.

Included in the price of the covers is the full set of six current Ross Dependency stamps issued on January 20, 1982. These were designed by Maurice Conly, who has also designed an attractive colour illustration for the covers.

Full details about the purchase of "Looking South" and the first-day covers are given on order forms inserted in this issue of "Antarctic." Additional forms can be obtained from the Treasurer, N.Z. Antarctic Society, P.O. Box 1223, Christchurch, New Zealand.

## NEW PRESIDENT

In the society's anniversary year the president is Squadron Leader W.C. Hopper, R.N.Z.A.F. (retd) who was elected at the annual meeting of the council earlier this year. He has been a member of the society since 1958.

Squadron Leader Hopper's first experience of Antarctica was in November, 1958, when he went south for his newspaper to provide photographs and reports of United States and New Zealand activities. Since then he has made six visits to Antarctica.

From 1961 to 1964 Squadron Leader Hopper was the Wellington branch publicity officer. He was a member of the committee for a number of years, and was chairman from 1966 to 1967. In 1966 he joined the Royal New Zealand Air Force to undertake recruitment publicity. He retired at the end of last year.

Vice-president of the society is Mr H. Burson, who has been the New Zealand treasurer since 1975. He went south in 1971 as an historic huts caretaker. Since then he has served on the Canterbury branch committee and was a vice-chairman from 1975 to 1978.

Other officers of the society are: Secretary, Mr G. D. Sylvester; treasurer, Mr H. Burson; editor of "Antarctic,"

Mr J. M. Caffin; honorary solicitor, Mr R. G. McElrea; honorary auditor, Miss I. O. Orchard.

One of the society's first volunteers to take part in the restoration of the historic huts, Mr Eric R. Gibbs, of Taihape, has accepted office as one of the society's two patrons. The other patron is Mr H. F. Griffiths, of Dunedin, a former New Zealand president and founder of the Dunedin and Canterbury branches.

Mr Gibbs, who was awarded the society's conservation trophy in 1975 for his work on restoration of the historic huts between 1960 and 1965, has had a

life-long interest in Antarctica and has a notable collection of Antarctic stamps and covers. He first went south in 1960 to work on the huts at Cape Evans and Cape Royds under the leadership of the late L.B Quartermain.

In 1963-64 Mr Gibbs returned as leader of another Antarctic Society party of three men to clean up and restore the older hut at Hut Point used as a store and a theatre by Scott's Discovery expedition. He went back again in the 1964-65 summer with one companion to complete the structural strengthening of the hut.

## Mid-winter mail drop to Pole

A third mid-winter mail and supply drop to 20 Americans at the Amundsen-Scott South Pole Station was made on June 21 by a United States Air Force Starlifter. The aircraft which was refuelled in the air by a KC10 tanker on its flight from Christchurch also dropped mail, fresh food, and equipment by parachute into the darkness of Williams Field on the Ross Ice Shelf for 94 men and two women at McMurdo Station and Scott Base on Ross Island.

Another flight was made to McMurdo Station on June 24 because of the volume of cargo. This year the Starlifter's load for the two flights was 333.5 tonnes. The drop at the Pole was 1.9 tonnes, and the two drops for McMurdo Station and Scott Base totalled 31.6 tonnes.

This was the fifth mid-winter mail and supply drop in eight years, and the first to require two flights. To make the first drop to 83 men and two women at McMurdo Station, 11 men at Scott Base, and 18 men and two women at the Pole Station, the Starlifter flew 5600 miles from Christchurch to the Pole and back, and was in the air for 15 hours and 5 minutes. The second flight took 10½ hours.

On the first flight the Starlifter left Christchurch at 4.10 a.m. For part of the way south the aircraft encountered 100-knot head winds. But 53 bundles of

mail, fresh food, and replacement parts, were dropped for McMurdo Station and Scott Base, and nine bundles at the Pole Station where the temperature was minus 42deg Celsius, and the wind speed was 28 knots.

Blowing snow and low visibility prevented the second drop to McMurdo Station and Scott Base on June 23. The Starlifter left at 6.30 a.m. the next day when terminal weather and visibility were good, dropped 80 bundles, and returned to Christchurch at 5 p.m.

A KC10 tanker flew south from Auckland to carry out the mid-air fuelling operation on both flights when the two aircraft were just north of McMurdo Station. This time the KC10 flew to Christchurch after the second flight instead of to Auckland as it did last year.

## "Antarctic" index"

Completion of the index to Volume 9 of "Antarctic", which covers the years 1980 to 1982, has taken longer than expected, and it will not be printed until later this year. Subscribers will be advised of the cost as seen as possible, and also when copies will be available from the treasurer of the New Zealand Antarctic Society, P.O. Box 1223, Christchurch.



# China becomes Antarctic Treaty member

China has acceded to the Antarctic Treaty and plans to establish a permanent research station on the continent when conditions permit. The accession of the People's Republic of China last month brings the treaty membership to 27. Of these 14 are consultative members and 13 acceding members.

Notice of China's intention to seek membership was given by Mr Wu Heng, director of the Chinese National Antarctic Research Committee in Peking on May 11. He said that the standing committee of China's National People's Congress had decided to seek membership to "help" Chinese scientists further their co-operation with other countries in polar research and the earth sciences.

Mr Wu said China planned to set up its own research station in Antarctica "when conditions permit." It had plans to establish a polar research institute, train more specialist scientists, and increase the number of scientists visiting Antarctica.

China has been interested in Antarctica affairs since 1977. Observers have attended the 1980 and 1982 meeting of the Scientific Committee on Antarctic Research, and since the 1979-80 season Chinese scientists have worked with the Australian and New Zealand research programmes.

New Zealand has been associated with the long-term plans of the People's Republic of China to establish a station on the continent, and there have been discussions on scientific and logistic questions since 1979. China has also received support and co-operation from Australia, Japan, Chile, and Argentina.

Chinese scientists first worked with Australian National Antarctic Research Expeditions (ANARE) during the summer of 1979-80 when two scientists spent a month at Casey. They visited Scott Base and McMurdo Station and had discussions with the New Zealand Antarctic Division.

A national committee on Antarctic research was formed in 1981, and a geomorphologist wintered at Casey that year. Scientists wintered at Australia's three continental bases, Mawson, Casey, and Davis, last year. This winter there is a glaciologist at Casey, and a biologist is at Davis.

Last season Mr Wu Heng, the deputy director of the research committee, Mr Guo Kun, the deputy director of the Low Temperature Scientific Research Institute, Mr Li Xiong Chaung, and an interpreter, Mr Zhou Changlin, visited Canberra, Melbourne, and Sydney, and the Australian Antarctic Division's headquarters in Tasmania. They also visited Wellington, and Christchurch where they had discussions at the Antarctic Division.

Between November and December Mr Wu Heng and Mr Guo Kun went south for several days to gain an insight into operations on the continent, and the extent of New Zealand's science and support role. They visited Scott Base McMurdo Station, Vanda Station in the Wright Valley, and field parties at Lake Fryxell in the Taylor Valley.

China is expected to send its first expedition to Antarctica by 1985. To prepare for the construction of a base and a research programme on the continent eight Chinese scientists completed a training course at the Japanese National Institute of Polar Research in Tokyo last year.

For three months Japanese scientists at the institute taught their Chinese counterparts how to build and run an Antarctic base, and how to live and conduct research projects under harsh polar

conditions. The course included lessons on assembling and operating snowmobiles, installing communications and fuel supply systems, and procuring and shipping equipment for Antarctic use.

Japan intends to continue its co-operation with China's plans for Antarctic activities. The institute will send scientific papers and other reference material to the National Antarctic Research Committee in Peking.

### MARINE RESEARCH

China's future research programme could extend to participation in the Biological Investigations of Marine Antarctic Systems and Stocks (BIOMASS). The possibility of a co-operative marine research programme with United States oceanographers was raised last year in discussions with Dr S. Z. El-Sayed, convener of the International Group of Specialists on Southern Ecosystems and their Living Resources.

In the northern summer Dr El-Sayed, of the Department of Oceanography, Texas A and M University, visited China to discuss studies of the Antarctic ecosystem. He was asked to prepare a

programme in which Chinese oceanographers could take part.

Last winter Mao Xinghua, head of the Marine Biology Laboratory, First Institute of Oceanography, Qingdao, and a senior staff member, Zhang Kun-cheng, spent three months on a familiarisation course at Texas A and M. They also took part in a marine research cruise in the Gulf of Mexico aboard the university's research vessel Gyre.

Officials in the Chinese scientific community want ideas on what a co-operative marine research project should cover, and how much equipment and human resources would be needed. The proposal would go from the First Institute of Oceanography to the National Bureau of Oceanography, and then to the National Commission for Science and Technology.

If approved after review by all three organisations the programme could begin as early as the coming southern summer. The project would capitalise on the experience of four other Chinese oceanographers now engaged in research at Texas A and M.

## Plan for hovercraft at Davis

Six years after New Zealand made the first trials of a hovercraft in Antarctica the Australian Antarctic Division has called tenders for the construction of a hovercraft for use at Davis Station. The vehicle will be used for biological sampling by scientists in summer and autumn when sea ice is too weak to support people or machines but still too thick for boats to operate.

New Zealand's Antarctic Division first tested a small hovercraft from Scott Base in the 1976-77 season. Major trials were conducted in the 1977-78 season, and then the hovercraft was returned to Christchurch early in 1979. Although the hovercraft performed satisfactorily it did not offer enough protection for the driver in low temperatures and was too small for effective Antarctic operations. But the information gained from the trials was circulated to other countries to

assist them in any plans to use hovercraft for Antarctic operations.

Last year the hovercraft was sold by tender. The Invercargill buyer planned to use it for commercial eeling on southern rivers.

In the 1980-81 season the 22nd Japanese Antarctic Research Expedition (JARE-22) conducted trials of an experimental hovercraft designed for ship to shore use and inland transport across the ice-cap. Results of the trials from Syowa Station are not known.

Built by the Mitsui Engineering and Shipbuilding Co. Ltd, the MV-PP05A weighs 2.8 tonnes, has a payload of 600kg and carries a driver and crew of two. It was designed to operate in a minimum temperature of minus 20deg Celsius, and cruise at 30kmh over a smooth surface in a 7m head wind.

## ANARE REPORTS

# Autumn traverse from Casey

Australia's summer research programme at the three Antarctic stations, Mawson, Casey, and Davis, and the sub-Antarctic station on Macquarie Island, ended on March 31 when the *Nanok S*, which made the eighth and last voyage of the 1982-83 season, returned to Hobart. She became beset in new pack ice near Davis on March 11 and was released on the evening of March 18 after an unexpected break-up of the ice.

This winter there are 103 men and women at the four ANARE bases, nine less than last year. Of these 18 are on Macquarie Island, 29 at Casey, 27 at Davis, and 29 at Mawson.

India, the People's Republic of China, and New Zealand are represented in the Antarctic winter teams. Dr Vinod Dhargalkar, who is a marine biologist from the Indian Oceanographic Institute at Goa, is at Davis, and there are two Chinese guest scientists, Qian Songlin, a glaciologist, at Casey, and a biologist, Jian Jialun, at Davis. New Zealand is represented by a communications officer, Gary Anderson, at Mawson, and a carpenter, Phillip Liley, at Casey.

For the third successive winter there is a woman doctor at one of the continental bases. She is Robyn McDermott, of Canberra, who is medical officer at Mawson. Her predecessors were Louise Holliday, who wintered at Davis in 1981, and Julie Campbell, who spent last winter at Mawson.

Macquarie Island's five women included Peta Kelsey, of Claremont, Western Australia, who is a geophysicist with the Bureau of Mineral Resources, Nerida Sullivan, senior communications officer, of Penrith, New South Wales, who was on Macquarie in 1981, and the second radio operator, Judy Turner, of Bagdad, Tasmania. Gay Wooley, of Maroubra Bay, New South Wales, the first woman meteorological observer to serve at the station, has spent two years at Darwin. The cook is Vicky Aitken, a former home economics teacher from Melbourne.

Before the Casey team settled in for the winter five men were out in the field on the autumn traverse. They left on March 1 and returned to the station on May 2 after more than two months in the field, much of it spent travelling over an area never before traversed by surface vehicles.

During the 58-day journey the traverse party covered some 993km. The main purpose of the traverse was to extend glaciological observations of the ice-cap to the west of Casey along the 2000m contour line.

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*Strong winds at Lanyon Junction which blew the living van off its sledge and onto its side caused the first winter glaciological traverse to be aborted on May 27. The occupants, Tim Medhurst and Michael Martin were unhurt but the van and ice radar sustained some damage. The equipment will be recovered and repaired in time for the second winter traverse.*

---

*When the accident happened there were even stronger winds at Casey. They reached a speed of 128 knots.*

---

Studies of the ice sheet near Casey are part of the International Antarctic Glaciological Project which is investigating the ice sheet of East Antarctica. Traverses have been made south and east of Casey over the past decade as

part of the project. This year sees the first work being carried out to the west.

Temperatures during the autumn journey fell to minus 45deg Celsius, the average being minus 35deg. Twelve of the 58 days were unsuitable for travel but for the remaining time visibility was low and the wind blew constantly at 20 to 30 knots. Only 10 days were clear with sunshine. The surface over the new part of the route consisted mainly of high rolling sastrugi.

Observations made along the route included ice thickness, ice density, snow accumulation, gravity and magnetic measurements. In addition markers were established at 50km intervals along the new part of the route, their positions being obtained very accurately by using doppler measurements from polar-orbiting satellites.

Present plans call for the establishment of more markers and other observations further to the east during the spring traverse from Casey which is expected to depart in September. To support this longer journey depots of fuel and other supplies were set up during the autumn traverse.

A 24-year-old glaciologist, Tim Medhurst, led the traverse party. With him were George Hedanek (plant inspector), Peter James (surveyor), Bob Abeyskera and Brian Harvey (diesel mechanics). They used three D5 tractors on their journey, one towing sledges loaded with fuel.

### KRILL GROWN

Australian scientists have made a extremely significant contribution to the international investigations of Antarctic krill. An ANARE scientist, Dr Tom Ikeda, has grown krill in a laboratory through all stages of their life cycle. He is the first research scientist ever to achieve this result.

About 40 krill have been grown from eggs laid by females caught by scientists during the Nella Dan's marine research cruise in the Prydz Bay region last November-December. The eggs, which were laid in a laboratory aboard the ship on December 23, were carefully nur-

tured for the next four months in the Antarctic Division's laboratories at Hobart before reaching the first juvenile stage in mid-April.

Dr Ikeda, who is a senior research scientist with the Antarctic Division, has tried twice before to sustain krill through their growth cycle. Both attempts failed when refrigeration equipment keeping the krill at the temperature of their natural environment broke down. United States scientists have attempted to grow krill from eggs in a laboratory but a bacterial disease killed them when only about half-way through their growth cycle.

Dr Pat Quilty, deputy director (research), Antarctic Division, says that Dr Ikeda's important achievement will allow further detailed investigations of the biology of krill, providing information that is essential to the long-term management of krill stocks. Scientists now will not necessarily have to go to Antarctica to answer many of the questions about krill. They can do it in Hobart.

### HEAVY ICE

Nanok S, one of three ships chartered by ANARE which made eight voyages south during the season, struck more than her fair share of bad weather on her three voyages. She encountered difficult ice on her first voyage to Casey, and again in December-January when she carried machinery, materials, and more than 700 tonnes of pre-mixed dry concrete, for the rebuilding programme at Casey, Davis, and Mawson.

Cargo for Casey and Davis was delivered successfully in early and mid-January but heavy fast ice in Kista Strait and Horseshoe Harbour delayed the arrival of the Nanok S at Mawson in late January. Ice conditions at Mawson last winter were the severest on record since the station was established early in 1954. The Nanok S had to push through the fast ice in short thrusts forward, and then retreat before moving forward again. But in spite of the delayed arrival the ship was unloaded in very fast time and she arrived back in Melbourne on schedule on February 7.

On her final voyage Nanok S made a bad start. She took 17 days to reach Mawson from Melbourne the longest voyage on record on the route, and entirely because of the weather. For much of the journey the ship could make only six knots, half her normal speed. Then on the first day out after leaving Mawson for Davis she was hit by a 70 knot blizzard.

Delays and the exceptionally bad weather meant that the Nanok S did not arrive at Davis until March 9. She was thus in an area of considerable new ice at a time of the year when the pack ice could only be expected to get thicker.

### SHIP BESET

Sea ice normally begins to form in the Prydz Bay region during the first week of March. Planning for the 1982-83 season was based on this factor and the Nanok S was therefore scheduled to leave the region around that time. But sea ice began to form a week earlier than normal. The Nella Dan encountered considerable new ice in the Prydz Bay region on February 24.

Unloading at Davis was carried out around the clock and the Nanok S left at 6 a.m. on March 11. Later in the day she became beset. The Kapitan Markov, a Soviet ice-strengthened cargo ship, was allocated the task of assisting her but she had been released before the Soviet ship could reach the scene.

Within 24 hours of her release the Nanok S had cleared the pack ice region and headed for Hobart. Her troubles were not over; she encountered some difficult weather on the way north and she did not reach Hobart until March 31 after a voyage which lasted 47 days.

On the Nella Dan's last voyage of the season she made a one-day visit to Heard Island on March 12. With visits by two private expeditions in January and February the first three months of 1983 were the busiest the island has seen for 20 years.

During a five hour period ashore members of the expedition carried out brief scientific programmes in biology, geology, and geophysics. Collections

were made of seaweeds, starfish and sea spiders, terrestrial plants, and small invertebrates, and rock samples.

When members of the party inspected the buildings at the old ANARE station (1947-55) they found it to be in a very bad state. The huts were a complete write-off as were those of the United States PAGEOS expedition of 1969-70. However, three French huts erected for the joint French-Australian summer expeditions of 1970-71 are still solid and can be used to support basic summer expeditions.

Both the Nella Dan and the Nanok S reporting sighting icebergs at 49deg S in February and March. The iceberg 'outbreak' seemed to be confined to the area between 110deg and 140deg E. Nella Dan's last sighting was at 49deg S/136deg E, only 1000km south-west of Hobart.

### TRANSPORT PLAN

Plans for a new transport system for Australia's Antarctic research programme, which were announced by the last Government only three weeks before the General Election, are to be reviewed by the new Labour Government. The review, which may take up to three months, is in accord with the new Government's intention to re-examine all major expenditure proposals initiated by the previous Government before the election.

## Three drops to Macquarie

Three airdrops to the winter party of 18 at the Australian sub-Antarctic base on Macquarie Island have been made this year by the Royal Australian Air Force. The first was made on May 5 when 1730kg were dropped, the largest amount since these operations began in 1977.

Weather permitting the last two drops were planned to be made this month. The first was arranged for June 16 and the second for June 25.

## David Lewis and team in winter quarters

After sailing 5750 nautical miles from Australia and battling against gales, pack ice, and snowstorms, the Oceanic Research Foundation's ship Dick Smith Explorer is now in winter quarters, frozen into the ice of Prydz Bay, East Antarctica. The 21m auxiliary schooner and the international group of four men and two women aboard her will remain in the Rauer Islands area 40km south-west of the Australian base, Davis, until November. When the scientific research programme of the expedition is completed the ship will return to Sydney in March next year.

Led by Dr David Lewis the expedition, which is the third Antarctic research expedition organised by the ORF, left Sydney on November 14 last year and sailed from Albany, Western Australia, on December 13 for Prydz Bay, the deep embayment between the Lars and Ingrid Christensen Coasts of East Antarctica. The Dick Smith Explorer arrived at Davis on February 9 and left on February 16 for the Rauer Islands in the south-east part of Prydz Bay.

Damage suffered by the Dick Smith Explorer in the pack ice was repaired with the help of the staff at Davis, and samples of the expedition's fuel were cold tested. As a result Davis exchanged it for 2300 litres of Antarctic diesel fuel to keep the ship's two generators running during the winter.

Members of the ORF expedition worked with zoologists, geologists, and meteorologists of the summer team at Davis during their stay. In a field exercise the Danish naturalist, Jannik Schou, and the Australian zoologist, Jamie Miller, were taken by helicopter to a frozen fiord to learn the techniques of seal tagging.

Originally Dr Lewis planned to winter in the Larsemann Hills area 110km from Davis. But when he arrived at Davis the Larsemann Hills were inaccessible because of heavy pack ice.

Ice conditions in Prydz Bay were abnormal last season. There was a dearth

of summer gales which usually break up the pack. The even rarer onshore south-west winds last season blew the pack on to the coast and consolidated it.

On February 11 David Lewis and the deputy leader, American anthropologist Mimi George, flew to the Rauer Islands by helicopter to make a reconnaissance of areas for possible suitable winter quarters. In a message to the ORF David Lewis indicated that the expedition would visit the Larsemann Hills in the Dick Smith Explorer before the summer ended, ice permitting, and begin work on seal censuses and other research.

But the message also suggested that most probably the ship would winter in one of several protected bays in the Rauer Islands. From there field trips could be made across the 64km of sea ice by sledge and motor toboggan to the Larsemann Hills after the freeze began in March and April.

In a report to the ORF early in April David Lewis said that the choice of winter quarters had proved excellent despite several 160km an hour blizzards which had disintegrated ice to the west. The ship was warm and comfortable, and a research programme was under way. It included seal tagging, a seabird census, fish collecting for ANARE scientists, and a study of beach dynamics.

On April 8 David Lewis and Mimi George returned from a nine-day reconnaissance of the Rauer Islands, hauling

their sledge over the sea ice. During the trip they made a survey of ice conditions, and the state of several potential winter quarters sighted during the helicopter reconnaissance in February.

Two severe blizzards broke out

seaward ice from the western Rauers, and all along the coast south-westwards. This forced the team to spend two arduous days portaging the sledge and gear across one of the islands to a ridge of fast ice.

## SAE-28

# Two new ships used in support operations

Two vessels, both operating in Antarctic waters for the first time, were used last season by the 28th Soviet Antarctic Expedition (SAE-28) to set up seasonal stations in the Weddell Sea area, and to carry scientists and support staff and supplies for the programme. They were the ice-class cargo ships Kapitan Myshevskiy and Pavel Korchagin.

SAE-28 was commanded by Nikolay A. Kornilov, a deputy director of the Arctic and Antarctic Institute in Leningrad, who made his fifth trip south last season. Aleksandr N. Artem'yev is in charge of the 1983 winter group at the seven permanent stations.

A new seasonal field station named Soyuz in the Beaver Lake area (78deg 48min S/68 deg 20min E) at the northern end of the Prince Charles Mountains near the Amery Ice Shelf was established last season by the Soviet research vessel Professor Vize which made its 11th trip last season. ("Antarctic," March, 1983). A second research vessel, the Professor Zubov, also on her 11th trip, was the first SAE-28 ship to leave the Soviet Union. She relieved and resupplied Bellingshausen on King George Island in the South Shetlands, and then continued scientific work as part of the Poles-South oceanographic programme in the Southern Centre.

Druzhnaya I on the Filchner Ice Shelf was operated last summer for the eighth successive year, and also Druzhnaya II which was set up on the east coast of the Antarctic Peninsula at 75deg S on the Ronne Ice Shelf. SAE-28 also made seasonal use of Komsomol'skaya, the former winter station at 74deg 06min

S/94deg 35min E between Mirny and Vostok.

Both the Weddell Sea summer stations were set up by the Kapitan Myshevskiy and the Pavel Korchagin. The former vessel, launched in the Soviet Union in 1970, made history in May-June, 1978, when she was convoyed by the Soviet nuclear icebreaker Sibir' from Murmansk to the Bering Strait along a route passing north of the offshore islands of Siberia. The trip was intended to test the design of ice-class ships that might be capable of year-round Arctic navigation.

SAE-28 also used the cargo ships Kapitan Markov and Pioner Estonii, and the tanker Samotlar which took a cargo of oil products for the bases from the Black Sea refining centre of Batum. The fleet was headed by the flagship Mikhail Somov which took most of the winter scientists and support staff south in early February.

Last season the passenger ship Bashkiriya sailed from Leningrad instead of her home port Odessa. This time she was used to take members of the expedition to Maputo, Mozambique, for the 4900km flight to Molodezhnaya.

## BAS NEWS

# New Halley station ready next summer

Next summer the British Antarctic Survey's new Halley Station is expected to be fully operational. The station was completely rebuilt last season for the third time since its establishment in 1956. This was the biggest logistic task ever undertaken entirely by BAS, and major construction of the complex of two-storey buildings housed in four inter-connected permanent wooden tubes was completed in 10 weeks.

This winter there are 66 men at BAS stations. Of these 13 are at new Halley and 15 are at the old station, which was built in 1972-73. There are 12 men at Faraday in the Argentine Islands, 12 at Rothera on Adelaide Island, and 11 at Signy in the South Orkneys.

There is no BAS winter team at Grytviken, South Georgia. The station is still manned by servicemen who have resumed the meteorological observations interrupted last year by the Argentine invasion. The Bird Island biological station at the north-west extremity of South Georgia has a BAS winter team of three this year.

Bird Island was closed in April last year because of the South Atlantic conflict, and was reopened by two BAS ornithologists in September. Three other BAS staff spent the last two weeks of September inspecting Grytviken and were able to salvage some scientific records. Three more BAS scientists and two from the United States joined the Bird Island team at the end of November and worked at the station during the summer season.

New Halley is 14km from the previous site and 18km from the inlet where the Royal Research Ship Bransfield was moored when she brought men and materials for the rebuilding project. The ship arrived in the area on December 19 — a month earlier than usual.

When the Bransfield departed 10 weeks later the 62 men working on the project had completed all the major construction. General interior fittings and mechanical and electrical services will be added by the 12 men of the winter team,

and the station should be fully operational next summer. A team on the Bransfield next season will assist in the transfer of heavy equipment from the old station which will then be closed down as it is now moving uncomfortably close to the ice front.

## SEVERE STORM

Excellent weather throughout much of January and February greatly facilitated the building operations. However, a severe storm at the end of February, and the consequent breaking back of the fast ice, forced the Bransfield to leave her sheltered anchorage. It also halted outside activities at the old and new stations and grounded an aircraft which had arrived from Rothera, Adelaide Island. Fortunately, the ice ramp up to the top of the ice shelf remained intact and was still usable for reloading the ship in preparation for sailing for Signy, South Orkney Islands, at the beginning of March.

Continuing gales and high seas slowed down the Bransfield's passage north and she did not reach Signy until a week later. She remained there two days before continuing on to Bird Island to deliver more cargo and pick up the summer team. The ship then attempted to join HMS Endurance, the Royal Navy's ice patrol ship, south-west of Hope Bay

to collect the summer field parties from James Ross Island, but the route was blocked by heavy pack ice.

These field parties were eventually taken off the *Endurance*, on March 15 while the *Bransfield* proceeded to King George Island, in the South Shetlands. BAS men airlifted from Rothera were collected from the Chilean Rodolfo March Station and the ship then inspected the old British base in Admiralty Bay. A three-masted schooner, *Idus de Marzo*, carrying the first Spanish Antarctic Expedition, was anchored near the base and most of the 20 aboard went ashore. The expedition hoped to set up a base on King George Island.

Then the *Bransfield* returned to the Falkland Islands to take on fuel and cargo and, after a brief call to Punta Arenas to disembark home-bound summer parties, proceeded to Rothera. She arrived there at the beginning of April, picked up the field parties and sailed north again the next day to deliver fuel to Faraday Station, Argentine Islands.

#### SITE SURVEY

A party was then landed at Petermann Island, to perform the sad task of erecting a memorial cross and holding a service for the three men who were lost in the area in July, 1982. Then the ship returned to Rothera to stand by while the summer tasks were completed. These included a site survey by a Canadian expert for a hard airstrip.

On Horseshore Island the old base hut used by field parties, was repaired and restocked, and a depot was set up on Jenny Island. The *Bransfield* finally left the Marguerite Bay area in mid-April.

On the way north she called at Faraday, the American Palmer Station, the BAS Damoy air facility on Wiencke Island and the old BAS base nearby at Port Lockroy. After a final call at the Falkland Islands she sailed home by way of Rio de Janeiro and arrived at Southampton on May 19.

Meanwhile the *Endurance*, visited Bird Island, Signy, Faraday and Rothera in the first half of March. She returned to Bird Island at the end of the month.

Next month the R.R.S. *John Biscoe* will undertake a winter cruise as part of the long-term Offshore Biological Programme. She returned home early at the end of February for that reason.

Towards the end of July the ship is expected back in the operational area around South Georgia. The cruise will consist of two phases: a South Georgia zone survey, incorporating a series of oceanographical stations and an acoustic survey of krill, followed by an experimental phase working closely with krill patches. In mid-October the ship will proceed to Punta Arenas, Chile, and most of the biologists will then fly home.

Her next task will be a six-week programme studying Crabeater seals and ice associated ecosystems at the edge of the pack ice in the north-eastern part of the Weddell Sea.

Air operations went extremely well this season, and full use was made of the two Twin Otter aircraft by augmenting the air unit of three pilots and two mechanics with two more pilots in January. One aircraft made a brief visit to Punta Arenas, by way of Rodolfo Marsh Station, in mid-February, to pick up urgent supplies for Halley. These were flown to Halley a few days later and, after two weeks' delay because of bad weather, the aircraft returned to Rothera by way of Fossil Bluff in George VI Sound, having picked up some members of the Ronne Ice Shelf party en route.

Geophysical flights were continued over the Ronne Ice Shelf by the second aircraft until they were completed in late February. Aeromagnetic and gravity measurements were then made over the area linking the Ronne Ice Shelf and Antarctic Peninsula networks, and the aircraft finally picked up the rest of the Ronne field party and returned to Rothera by way of Fossil Bluff.

Some photographs were then taken over Alexander Island for the glaciologists and geologists, the remaining field parties were taken back to Rothera in early March, and Fossil Bluff was closed for the winter. The two aircraft left Rothera for Punta Arenas a



**Nearing completion in March this year are the main structures of the new Halley station — four wooden tubes each of which houses two-storey buildings.**

BAS Copyright

week later, one flying by way of Rodolfo Marsh Station, and were ferried to Britain.

Before the onset of winter parties from the stations made a number of short journeys. A party visiting the Jalour Islands, near Faraday in March, was surprised to encounter a Magellan penguin. This was the first time that a Magellan had been reported anywhere in the Antarctic Peninsula area. They are normally found at the southern tip of South America and in the Falkland Islands.

A small celebration was held by the geophysicists at Faraday in April to mark the closing down of the radiation programme which had run continuously for 23 years, and at Adelaide Island visits were made to the old Adelaide station 60km to the south-west and to the Fuchs Ice Piedmont beyond.

In the South Orkneys work was completed on the new jetty at Signy. All staff gave a hand with the final concreting (12 tonnes mixed and poured in four hours) before resuming the scientific programmes.

Two boat parties tried to replenish depots on nearby Coronation Island, but one was unable to land because of

rough seas. One man later slipped and broke his leg, but the doctor has reported that it was fortunately a clean break and is healing well.

At Halley a number of visits were made from the old station to the new. Ionosphericists began constructing an array of aerials at the new station in preparation for moving the advanced ionospheric sounder next summer.

Two parties travelled towards the hinge zone (the junction of the floating and grounded ice shelf) in April. A depot was replenished and glaciological stakes raised. Other groups visited the Emperor penguin rookery and travelled along the coast towards the Stancomb-Wills Glacier. All were back at base in time for the annual "sundowners" party.

In late February the United States Coast Guard icebreaker Polar Star arrived at Halley and a team from the Arms Centre and Disarmament Agency inspected the station in terms of the Antarctic Treaty. The National Science Foundation research vessel Hero, based at Palmer, visited Faraday in early March, about the same time as the French yachts Damien II and Graham return from the Marguerite Bay area.

## CHILEAN PROGRAMME

# Exploration flights by Air Force

Establishment of a summer sub-base on Charcot Island in the Wilkins Sound area south-west of Alexander Island, an Antarctic Peninsula traverse from General Bernardo O'Higgins Station on the east coast of Trinity Peninsula to Duse Bay on the Weddell Sea coast, and aerial exploration by the Chilean Air Force to the southern part of the Antarctic Peninsula, were among the activities in last season's research programme sponsored by the Chilean Antarctic Institute (INACH). Two ships were used during the season — the 240 tonne motor-ship *Capitan Luis Alcazar* for research programmes, and the 2785-tonne ice-strengthened naval transport *Piloto Pardo*.

More than 60 scientists, including five from West Germany, took part in the programme, and there were six observers from the People's Republic of China, Uruguay, and Peru. Scientists in the INACH programme worked on islands in the South Shetlands and off the Antarctica Peninsula, in Bransfield, Gerlache, and Bismarck Straits, and at the three permanent bases, Arturo Prat, Bernardo O'Higgins, and Rodolfo Marsh.

To transport scientists and base staff Chile used the two ships and nine aircraft, two Twin Otters, two Hercules aircraft, and five helicopters, two of which operated from the *Piloto Pardo*. Between January 3 and March 5 when she returned to Puerto Montt, the *Capitan Luis Alcazar*, which has accommodation for 38 passengers, supported research projects. She worked in Bransfield Strait (King George Island), Gerlache Strait (Punta Spring, Hughes Bay) and Bismarck Strait (Anvers Island).

During the season the *Piloto Pardo*, which carried two Bell Jet Ranger helicopters, operated in Bransfield and Gerlache Straits. To relieve and supply bases in the South Shetlands and on the Antarctic Peninsula she made several trips from Punta Arenas, Tierra del Fuego, between December and January.

A new sub-base was established by the Chilean Air Force on Charcot Island (69deg 43min S/75deg W) in the Wilkins

Sound area. An advance party from Rodolfo Marsh prepared a 2500m ice runway, and during the summer an exploration group of 19, including two scientists, worked from the sub-base with aircraft and helicopter support.

For the third consecutive year the base Gabriel Gonzalez Videla, established in Paradise Bay on the Danco Coast in 1951, was opened last summer from January to February. The Air Force reactivated the base in December, 1980, for an exploration project known as Skua Polar I. Then in the 1981-82 season an Air Force team of 13 men was sent to the base to instal meteorological and communications facilities for air operations on the Antarctic Peninsula.

An additional objective was to provide helicopter support for scientists from the University of Chile who have started to develop a research programme in the area. In the 1981-82 season a new hangar was built near the base.

Another sub-base, Adelaida (67deg 34min S/68deg 08min W) and a new refuge, both constructed by the Air Force in the 1981-82 season, were also occupied in January and February this year. Adelaida is on Adelaide Island, and the new refuge is on Ardley Island in Maxwell Bay off the south-east end of King George Island.

In the 1981-82 season two Twin Otter aircraft flew a party of 10 from Rodolfo

Marsh to set up a camp on Adelaide Island for construction of the sub-base. Materials and equipment were flown south, Twin Otters making eight flights, and Hercules aircraft five.

Two buildings constructed of light materials, and with accommodation for six men, were placed on Ardley Island. They were equipped for use by the Air Force and scientific field parties.

During last summer the sub-base Yelcho on Doumer Island in the Palmer Archipelago was used again. Scientists also worked from the refuge Spring at Punta Spring on the Danco Coast.

An international co-operative programme of geodesy and glaciology between INACH and the University of Hannover was continued on Anvers Island and at Punta Biscoe. With Air Force support two field camps were established 20km inland. A West German group headed again by Dr Gunther Seeber, and Chilean scientists, conducted ice movement studies, using Dopple measurements, and verified measurements made in the 1981-82 season on Anvers Island and at Punta Spring.

Seismological and ionosphere recordings, and tide measurements, were continued at the permanent stations, Bernardo O'Higgins and Rodolfo Marsh. Physicists from the University of Concepcion conducted upper atmosphere studies on King George Island, and measurements of gamma radiation were made by the Chilean Nuclear Energy Commission on King George Island, and Greenwich and Doumer Islands. Geological field parties also explored some mineral zones on Brabant and Anvers Islands in the Palmer Archipelago, and conducted isotopic studies of trace elements on Deception Island.

Oceanographic studies were conducted in Bransfield Strait from the Capitan Luis Alcazar, which was chartered for a second season by INACH from the Chilean Maritime Corporation. Other biological projects included studies of marine mammals, ornithology, the ecology of fishes, and the ecology, ecophysiology, and evaluation

of species and communities of Antarctic plants and sub-Antarctic terrestrials. One scientist from the University of Kiel worked with scientists from the University of Valparaiso in the South Shetlands and on Navarino Island, Tierra del Fuego, studying the ecology of Antarctic plants and sub-Antarctic terrestrials.

Biologists from the National Museum of Natural History and the University of Chile studied marine mammals on King George Island, Livingston Island, and the Byers Peninsula in the South Shetlands. Another party conducted ecological studies of three types of penguins on Ardley Island.

Since 1978 satellite data collection platforms (DCPs) have been installed at Rodolfo Marsh and Bernardo O'Higgins, and in Duse Bay. Last season's traverse from Bernardo O'Higgins to Duse Bay across Trinity Peninsula — a distance of about 60km — was made for the revision and maintenance of the DCP.

Three women took part in the scientific programme last season. Liliana Nilo Fonseca was one of two scientists from the National Museum of Natural History who worked in the South Shetlands to obtain information about the anthropology and archaeology of the Antarctic and sub-Antarctic. Maria Quero Bernal and Beatriz Caorsi Ponce, of the University of Chile, were stationed at Rodolfo Marsh where they analysed flora bacteria in the skin and mucus of base staff, and checked probable alterations caused by Antarctic living conditions.

Two projects concerned with Antarctic living were carried out at Rodolfo Marsh between January and March with the support of the Corporation for the Promotion of Production (CORFO). The Catholic University of Chile project was a study of human settlements, and the University of Chile of project was an investigation of hydroponics as a means to produce fresh vegetables.

Both observers from the People's Republic of China were on King George and Livingston Islands, and at Rodolfo Marsh in November and December. One

studied the marine mammals programme and the other was concerned with the meteorological work at Rodolfo Marsh. Two observers from Uruguay and two from Peru were aboard the Capitan Luis Alcazar in January and February.

Between October last year and this month the Chilean Air Force made nine flights between Punta Arenas and Rodolfo Marsh, its main Antarctic air base. Two flights south were made from Rodolfo Marsh over Wilkins Sound in November, and one in December. Single flights between Punta Arenas and Rodolfo Marsh will be made in April, May and June.

Air transport between Punta Arenas and Rodolfo Marsh was also provided

by the Air Force for the scientists from the University of Hannover. Four United States scientists from the Point Reyes Bird Observatory who continued their behavioural and ecological studies of Adelie, Chinstrap, and Gentoo penguins in Admiralty Bay, King George Island, were flown from Rodolfo Marsh to the Polish Arctowski Station and back at the end of the month. Helicopter transport to Arctowski was provided for four scientists from the Institute for Marine Science, University of Kiel.

After the summer programme ended 46 men remained at the permanent bases for the 1983 winter. There were 23 at Bernardo O'Higgins, 11 at Arturo Prat, and 12 at Rodolfo Marsh.



West Germany's new polar research and supply ship, the Polarstern, made her maiden voyage to Antarctica last season. She is shown above leaving port with flags flying and escorted by tugs.

Built for the Federal Ministry of Research and Technology at a cost of DM190 million, the Polarstern is considered to be the most up-to-date polar research ship in the world. She is 118m long and 25m wide, and can travel at up to 18 knots. Her equipment includes a 12.5m research launch named Polarfuks, and three covered motor lifeboats.

To improve her performance as an icebreaker the Polarstern is fitted with jets below the waterline which exude a mixture of air water from the bow. Air is pushed under the ice, lifts it, and makes it easier to break. The air and water mixture also runs along the ship's hull, tak-

ing with it broken ice which otherwise would build up.

A new hull design is claimed to add to the ship's icebreaking capacity. The lower part of the bow has been built in a concave shape, and the hull is clad in twin layers of special sheet steel up to 43mm thick.

## Byrd's last seven

There are only a few veterans of Byrd's first expedition in 1928-30. Of the 41 men who wintered with Byrd at Little America I in 1929 only seven remain. They are Dr Laurence Gould (geologist and second-in-command), Henry Harrison (meteorologist), Kennard Buber (aviation mechanic), Edward Goodale (dog driver), Norman Vaughan (dog driver), and Dean Smith (pilot).

## Japan's plans for third station

Japan plans to set up its third Antarctic station in eastern Queen Maud Land by 1988. Next season's Japanese National Antarctic Research Expedition will explore a route to the proposed site of the station which will be about 630km west of Syowa at about 75deg S/30 deg E.

Syowa, the main Japanese station, on East Ongul Island in Lutzow-Holm Bay, was established in 1956. Its second permanent station is Mizuho about 300km to the south-east of Syowa on the inland ice sheet. It was opened first in 1970 and since 1976 has been manned winter and summer.

Since 1982 the JARE glaciological programme has been concentrated on eastern Queen Maud Land where there has been little exploration in past seasons. Four the next four years, in-

cluding 1983, Mizuho Station will be the centre for glaciological field studies of an area between 20deg E and 50deg E, and from the coast to about 80deg S.

Plans for the future glaciological programme outlined in 'Antarctic,' December, 1981, indicated that an inland station would be maintained for one winter at about 75deg S/30deg E. This month's announcement suggests that for several seasons before 1988 the station will be used as a summer field camp only.

## Larger winter team at Arctowski

Poland has a slightly larger winter team this year at Arctowski Station in Admiralty Bay on King George Island, South Shetlands. There are 13 scientists and technicians at the station compared with nine in 1982.

Led by a biologist, Dr Marek Zadanowski, the team sailed from Gdynia early in January aboard the cargo ship *Zawichost* commanded by Captain Tadeusz Maslyk. It is expected to return to Poland in April next year.

Dr Zadanowski's five research workers from the Institutes of Ecology, Geophysics, and Meteorology, and Warsaw and Lodz Universities, are Antoni Adamowski and Stanislaw Marszczek (meteorologists), Drs Ryszard Ligowski and Aleksy Lukowski (biologists) and Jerzy Sacewicz (geophysical engineer). The deputy leader for technical services is an engineer, Zbigniew Galazka, who has a team of six technicians, including a radio operator and a cook.

Science programmes include the population dynamics and migration of Antarctic seals, environmental protection at and around the station in relation to human activities, and a study of the

concentration of heavy metals and Cl hydro-carbons in abiotic compounds and selected marine and terrestrial organisms. Continuous recordings are being made all winter of seismic activity and variations in the Earth's magnetic field.

Last summer two West German biologists worked at the station. They were picked up by the research and supply ship *Polarstern* on her way back to Bremerhaven after her first Antarctic cruise.

## Indian scientist at Davis

One of the 28 men who are wintering at Davis this year is an Indian marine biologist, Dr Vinod Dhargalkar, of the Indian Oceanographic Institute at Goa. He is a specialist in seaweeds, and his research will be done mainly in the fiords and lakes of the Vestfold Hills near Davis.

Dr Dhargalkar, who went south aboard the *Nanok S*, is expected to work at the Australian Antarctic Division for three months on his return before he goes back to India.

## New field base built at Grunehogna

A new field base at Grunehogna in the Ahlmann Ridge mountain range of western Queen Maud Land was established by the South African National Antarctic Expedition last season. The base, which is about 250km from Sanae on the Fimbul Ice Shelf, will enable geologists and surveyors to do more work each summer with long-range helicopter support on projects in the second phase of SANAE's earth sciences programme which was instituted in the 1980-81 season.

Last season the SANAE research and supply ship *Agulhas* made two trips south from Cape Town. When she sailed in the middle of December she carried the SANAE-24 relief team as well as new snow vehicles, fuel, building materials, and Public Works Department construction workers who were to build the Grunehogna base.

On the way south the *Agulhas* stopped at Bouvet Island where two automatic weather stations were installed. She arrived at Sanae just before Christmas and sailed early in the New Year for an 11-day marine survey which included dredging and the deployment of weather buoys in the mid-Atlantic Ridge area.

Towards the end of January the *Agulhas* sailed directly to Sanae. She remained there for three days and returned with the Public Works Department construction team and summer staff in the third week of February.

In June-July the *Agulhas* will make a special research cruise to support a multi-national study of the upper atmosphere by scientists from South Africa, the United States, France, Brazil, and West Germany. The purpose is to increase global understanding of how the earth's atmosphere and magnetic field are influenced by solar radiation.

Since the early 1970's South Africa's atmospheric science programme has been extended from Sanae, and now includes similar but less intensive investigations at Marion and Gough

Islands, and also aboard the *Agulhas* as it steams between Cape Town and these stations. Interest has included a strong focus on the South Atlantic anomaly region where the earth's magnetic field is weaker than anywhere else. It lies approximately between 30-50deg S and 0-50deg W. This is the area where the *Agulhas* began its cruise this month.

Grunehogna is the third field base to be established in the mountains of western Queen Maud Land south of Sanae since 1969. It consists of six buildings — three for sleeping, a living room, a power shack, and a store — and will accommodate 18.

In 1969 a small base known as Borge Base was established in the Borge Massif 380km south of Sanae. The first Grunehogna was 215km south of Sanae in the Ahlmann Ridge mountain range at 72deg 02min S/ 02deg 48min W. Earth scientists wintered at these bases and were able to start field work earlier in the spring.

By 1975 virtually all the exposed rock reasonably accessible by snow vehicles from Sanae, Grunehogna, and Borge had been geologically studied and mapped. Further work was then halted until air support became available. Two long-range Puma helicopters operated and maintained by the South African Air Force under contract to the Department of Transport became available in 1980 and the second phase of the earth sciences programme was started.

Geological activities are aimed primarily at the Ahlmann Ridge, Borg Massif, Kirwan Escarpment, and Jutulstraumen Glacier regions of western Queen Maud Land. Present research is in the main related to better understanding of the Africa-Antarctic break-up as western Queen Maud Land is assumed to have lain adjacent to the eastern coast of Southern Africa before Gondwanaland broke apart.

In addition attention is being focussed on the flat-lying platform sediments equivalent to the Waterberg Group in the Transvaal. A large proportion of South Africa's mineral wealth is won from sedimentary basins. Studies of the ancient sedimentary basin in western Queen Maude Land could have relevance to the identification of exploration targets within South Africa.

South Africa has 35 projects in its present Antarctic research programme which cost 1.123 million rand in the 1982-83 financial year. An outline of these projects and an indication of future research, were given by Mr A. Harvey, the South African Consul-General in New Zealand when he addressed the Wellington branch of the New Zealand Antarctic Society earlier this year. Some of his information has been incorporated in this report.

Fourteen of the research projects are carried out mainly at or from Sanae, 13 mainly on Marion Island, and eight from the Agulhas. Five of the 35 have an interest in Gough Island, and one is focussed on the French Kerguelen and Amsterdam Islands, and the Prince Edward Islands.

Oceanography is the newest of the sub-programmes in the national Antarctic programme. South African scientists made two preparatory BIOMASS research cruises into the Southern Ocean, using the Protea in 1978 and the Agulhas in 1980. Scientists from South Africa and the United States were aboard the Agulhas for FIBEX (First International BIOMASS Experiment) in 1981 when ships and scientists from South Africa, France, Japan, and Australia concentrated on the Indian Ocean sector of the Southern Ocean.

In terms of future research Mr Harvey says it is believed that the biological oceanographers should continue to focus on the BIOMASS programme and participate actively aboard two ships — the new Sea Fisheries Research Institute's Africana and the Agulhas — in the Second International Biomass Experiment (SIBEX) planned for the 1983-84 and 1984-85 summer seasons. They should also begin to concentrate more on the sub-Antarctic ocean region surrounding the Prince Edward Islands.

A new research project known as MOES (Marion Offshore Ecological Study) is being planned for the 1983-84 season. From this project information on the nature and abundance of living resources within about 200km of the islands should start becoming available over the next few years.

Chemical and physical oceanographers wish to focus on the oceanic frontal systems south of South Africa — the Antarctic Polar Front (APF) between the Southern Ocean and the sub-Antarctic and sub-tropical regions. They are also expected to become more concerned with interpretation of the findings of the BIOMASS programme.

## Frigate's dash

A round trip of 2500 nautical miles was made last December by the South African Navy frigate President Pretorius to bring medical help to an injured scientist at the research station on Marion Island, one of the Prince Edward Islands, which are 1241nm from Cape Town. One of three scientists doing mammal research was injured while putting up a radio antenna, being hit in the eye when a wire broke.

As it was thought that specialist treatment was needed the frigate, with a doctor on board, was diverted on December 14. She reached the island at dawn on December 18 and during her 90-minute stay the injured scientist was lifted aboard by a Wasp helicopter. On December 21 the President Pretorius arrived back from Simon's Town, her home port.

# Brazil's two Antarctic expeditions

Brazil, which sent its first two expeditions to Antarctic last season, is expected to establish a permanent base somewhere on the Weddell Sea coast but not for several seasons. Last season's expeditions used two ships — the Barao de Teffe, formerly the Thala Dan, and the Professor W. Besnard.

After calls at stations in the Antarctic Peninsula area the Barao de Teffe worked in the Weddell Sea and off the Princess Martha Coast of Queen Maud Land. Her last call was to the West German station, Georg von Neumayer, in the Atka Bay area.

A marine biology and oceanographic research programme was undertaken in Bransfield Strait aboard the Professor W. Besnard by scientists from the Oceanographic Institute of the University of Sao Paulo. The two-stage programme was a preliminary to future Brazilian participation in the Second International Biological Experiment (SIBEX) which is part of the Biological Marine Systems and Stocks Programme (BIOMASS).

In an article on Latin American activities and interests in Antarctica by Celia Heil, of the United States National Science Foundation's Division of Polar Programmes, which summarised published material from Latin American newspapers and other sources, it is suggested that last season's expeditions, assisted by Chile and Argentina, was Brazil's formal application to consultative membership of the Antarctic Treaty. Brazil acceded to the treaty in 1972.

According to the article one objective of the expeditions was to establish a base on the Antarctic Continent somewhere on the Weddell Sea coast outside the territories claimed by Argentina and Chile. The purpose was for the exploration and exploitation of oil reserves and krill.

But these reports do not square with official statements from the coordinators of the Brazilian programmes. There were earlier reports that a permanent station would be built in the Atka Bay area in the 1983-84 season; the

answer was that the precise location of the station had not been determined, and the first expeditions were in the nature of a reconnaissance designed to give Brazilian scientists knowledge of an area where they will work in future seasons.

## TWO HELICOPTERS

When the Barao de Teffe sailed from Rio de Janeiro on December 20 last year she carried a crew of 48 officers and men of the Brazilian Navy, four pilots and seven mechanics to operate her two helicopters, and an Antarctic navigation expert, Captain Peter Granholm, who commanded the ice-strengthened polar ship Thala Dan before she was bought by the Brazilian Ministry of Marine in May last year from her Danish owners, J. Lauritzen Lines, for \$3 million. She also carried two mountaineering and survival specialists, a New Zealander, Peter Barry, and Adalbert Kolpatzik, both of the Paulista Alpine Club.

Three areas of work were outlined in the ship's programme. The first covered training in navigation and helicopter operations, and free diving; the second was to test equipment and instruments for marine biology and physical oceanography research. Radio reception equipment was carried for research into VLF propagation by a team from the Spanish National Research Institute.

Headed by the Director of Hydrography and Navigation (M. Marinha)

the Barao de Teffe expedition included 12 scientists and technicians. The ship was commanded by Captain Fernando Andrade Pastor de Almeida, and his deputy was Captain Arthur Orlando Brederodes Pires.

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*Brazil has named her polar research ship, once the Thala Dan, and new Barao de Teffe, in honour of the Baron of Teffe, Admiral Antonie Luiz von Hoonholts, a noted seaman and hydrographer. He was one of the first to survey the Brazilian coast and rivers.*

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Scientific leader was a hydrographer — meteorologist, Captain Eugenio Neiva, of the Interministerial Commission on Marine Resources (CIRM) which drafted the initial Brazilian Programme of Antarctic Activities (PRO-ANTAR). Captain Marco Antonio Bompert, a hydrographer and geologist, was from the Directorate of Hydrography and Navigation.

### FIVE WOMEN

Five of the scientific team are women — two biologists, Dr Isabel Gurgel (State University of Rio de Janeiro) and Dr Monica Montu (Federal University of Parana), an ecologist and doctor of medicine, Dr Maria Judith Cortesao (Secretariat for the Environment), a geographer, Jane Mocellin (Federal University of Rio Grande do Sul), and a physicist, Dr Vera Lucia Kuntz (Institute of Space Research).

Others in the team were two scientists from the Department of National Minerals Production, an electronics technician from the Institute of Space Research, and the two survival specialists.

There were five observers from the Ministry of Foreign Affairs, the Army and Air Ministries, the Naval Artillery Corps, and the Industries Federation of the State of Sao Paulo. Foreign observers were two Chilean Navy officers, one from the Peruvian Navy, and an Argentine Navy meteorologist.

Two film cameramen and a photo-

grapher from the Secretariat for the Environment took part in the expedition. Newspaper coverage was provided by a writer and a photographer from a Brazilian news agency.

After leaving Rio de Janeiro the Barao de Teffe's first call was at Rio Grande, the port of the State of Rio Grande do Sol. The university there has provided an area for storage of supplies and other material for future expeditions.

Brazilian plans are for the university at Rio Grande to be used as a departure point, for logistic support for the Antarctic programme, and staff training. Facilities will be provided at the university's marine centre to process sea products harvested from Antarctic waters.

British and West German scientists have expressed interest in participating in the Antarctic programme at the university. During the two years of preparation the expeditionary group was in close touch with the Scott Polar Research Institute and the Chilean Antarctic Institute, and received scientific and technical advice from the United States.

From Rio Grande the Barao de Teffe proceeded to the Antarctic Peninsula area where she called at six stations — Bellingshausen (Soviet Union), Arturo Prat (Chile), Arctowski (Poland), Palmer (U.S.A.), Almirante Brown (Argentina) and Faraday (Britain). In the third week of January she resupplied at Punta Arenas, the Chilean port of Tierra del Fuego, and then sailed for the Weddell Sea. She return from the Princes Martha Coast directly to Rio Grande where she arrived at the end of February.

### MARINE RESEARCH

An oceanographic research ship, the Professor W. Besnard took 12 scientists and technicians on each of her two cruises. The majority were from the University of Sao Paulo. Two were from the Superintendency of Fisheries Development.

Captain Adilson Luiz Gama was in charge of the ship for the university's

Oceanographic Institute. His deputy was Pilot Valdir de Casta Freitas. Scientific leader on the first cruise was a biologist, Dr Motonaga Iwai, of the University of Sao Paulo.

With Dr Iwai were biologists from his university, and the Federal Universities of Rio Grande and Parana. Others in the team were a medical officer, a meteorologist, and electronic engineer, and electronics and laboratory technicians.

On the second cruise the scientific leader was a geologist, Dr Valdenir Furtado, of the University of Sao Paulo. His team included a chemist, biologists,

an electronics engineer, a physical oceanographer, a meteorologist, and a fisheries development biologist.

After leaving Santos, the port of Sao Paulo, the Professor W. Besnard made a stop at Rio Grande towards the end of December. She stopped at Ushuaia, the Argentine port of Tierra del Fuego early in January to refuel and take on more supplies.

In the third week of January she called at Punta Arenas for the same purpose. Her last call was at Ushuaia again in the third week of February, and she arrived back at Santos early in March.

## First Spanish research expedition

Spain, which acceded to the Antarctic Treaty on March 31, 1982, sent its first scientific expedition to Antarctica last season. The research vessel *Idus de Marzo* (Ides of March) was in the Antarctic Peninsula area in February.

Originally a group of sailors, scientists, and journalists announced a plan to make a seven weeks' voyage to Antarctica in the auxiliary schooner *Idus de Marzo*. The purpose, according to Spanish newspaper reports, was to influence public opinion and the Spanish Government as the first step towards the establishment of a Spanish base in Antarctica. ("Antarctic," September, 1982).

Since then the Spanish Government is reported to have sponsored the activities of the expedition. Representatives of the Spanish Navy, Ministry of Marine, and Institute of Oceanography, were among the 23 members of the expedition.

Built in July last year at a cost of about 140 million pesetas (\$US 1,125,000), the *Idus de Marzo* belongs to the Tourist Schooners Company, and is owned by Javier Babe and Santiago Martinez. She is 32.5cm long, three-masted, and her two 165 h.p. diesels give her a speed of 10.5 knots.

Krill research and a study of the submerged volcanic crater at Deception Island in the Antarctic Peninsula area, were included in the Spanish research

programme. The expedition also called at United States, Argentinean, and Chilean bases after it arrived in Antarctic early in February.

In the middle of December the *Idus de Marzo* sailed for the Canary Islands. She left Las Palmas on December 31 and in January called at Brazilian, Argentinean, and Uruguayan ports. Nine scientists from the Spanish Institute of Oceanography joined the expedition in Argentina, and then the *Idus de Marzo* sailed for the Chilean port of Punta Arenas, Tierra del Fuego.

## Mawson bronze at station

Australia's greatest Antarctic explorer, Sir Douglas Mawson, is remembered in bronze at the research station named after him. A bronze bust 80cm high by an Adelaide sculptor, John Dowie, was brought to Mawson, the oldest of Australia's three Antarctic stations, in January.

Last year a twin of the bust was unveiled in Adelaide to commemorate the centenary of the geologist's birth. This year the \$4000 bust for Mawson was taken south by Penny Greet, a PhD research student at the Mawson Institute for Antarctic Research in Adelaide.

## Vostok's ordeal by fire and ice

Twenty Soviet scientists and technicians who wintered at Vostok last year spent 227 days with only minimum power, heat, and light after a fire in the powerhouse destroyed the three main diesel units and all the standby generators. The fire was on April 12, and for more than seven months the men relied on two worn-out diesel units patched up to provide essential power for cooking in the electric kitchen and melting snow for water; a small kerosene heater; and candle-like devices made from wicks dipped in diesel fuel. Their ordeal ended on November 23 when the annual tractor-sledge train from Mirny arrived with a spare diesel generator, fuel, food, and other supplies.

No word of the fire in which the powerhouse engineer, Aleksei Karpenko, was killed when he entered the burning building to save the diesel units, was made public until early this year. Interviews were then published in Soviet newspapers while the 20 survivors of the winter team were on their way home aboard the passenger ship *Bashkiriya* which reached the Black Sea port of Odessa on March 13.

On April 12 at 4 a.m. a mechanic, Sergei Kuznetsov, was awakened in his quarters by the smell of smoke. Through the window of his hut he saw a black plume of smoke curling skyward from the powerhouse.

Outside the temperature was minus 59.2° Celsius, and there was a strong wind. Scientists and technicians, aroused from sleep, were unable to control the unusually smoky blaze which lasted only 15 minutes. Fire extinguishers did not function in the low temperature, and no smoke masks were at hand. Karpenko, was overcome by heat and smoke.

Apparently the fire was of electrical origin, and had been set off by a short circuit when the insulation of some wiring cracked in the dry and rarefied air. For a while flames from the fire seemed about to threaten the fuel stores but these were saved by a change in the wind.

With the onset of the winter night Vostok, which is on the Polar Plateau near the South Geomagnetic Pole at an altitude of 3477m, was without contact with the outside world except by radio until the arrival of the Mirny tractor-sledge train late in November. In late February the last regular supply aircraft, a ski-equipped Ilyushin-14, left for the main Soviet station, Molodezhnaya. It had to return in March to evacuate a physicist who was suffering from altitude sickness — a risky flight late in the season.

Vostok was without power or heat. Every light was out and temperature were dropping rapidly in the station buildings. Led by the station chief, Pyota Astakhov, the winter team first moved perishable goods and food into a hut which had a small kerosene heater. Then they doubled up on bunks in three small huts.

Next priority was to re-establish radio contact. Molodezhnaya had failed to raise Vostok in any of the four regular daily sessions, and everyone there was puzzled and worried.

Late on April 12 the men at Vostok managed to crank up a worn-out diesel engine that had been used in an ice-coring project. It barely worked but Molodezhnaya made out the faint Morse signals: Trouble with diesel power plant. Must keep this session short. Over and out.

Astakhov radioed the details on April 13. The news was then passed on to the Arctic and Antarctic Institute in Leningrad which is responsible for the Soviet Antarctic research programme. Emergency relief plans, including an air-drop by a heavy cargo aircraft from the Soviet Union, were considered and discarded because of the winter darkness, high winds at Vostok, and low temperatures.

So the Vostok team settled down for a grim winter. Over two months mechanics patched up a second scrapped diesel unit that had been left in cold storage. But while power was available to cook food and melt snow there was always a shortage, and care had to be taken to prevent overloads.

A minimum amount of heat was provided by candle-like devices consisting of wicks twisted partly out of asbestos fibre and dipped in diesel fuel. These gave off clouds of soot because of incomplete combustion caused by lack of oxygen in Vostok's rarefied atmosphere.

Temperatures around the primitive heating devices were 20 to 25 deg C, but dropped rapidly to below zero beyond two or three metres. The abrupt temperatures gradient caused the aluminium walls of the huts to buckle,

and the makeshift heaters had to be watched around the clock because of the fire danger.

In spite of their bleak existence the Vostok men continued some meteorological observations and magnetic studies. The deep-drilling project started in 1979 as part of the International Antarctic Glaciological Project, was also continued.

Last year the hole drilled through the polar ice-cap had reached almost 2135m. In spite of the makeshift power supply the ice-coring project took the drill down another 82m.

Vostok's ordeal by fire and ice ended on November 23 with the arrival of the men from Mirny. The new power plant they brought was put into operation promptly. This time the standby units were carefully stored some distance away.

This report is based on an article written by Theodore Shabad for the "New York Times". Mr Shabad who pieced the details together from the published Soviet interviews, is a joint editor of "Polar Geography and Geology", which prints English translations of papers on polar research from Soviet, Japanese, and European sources. He also provides news notes on current Soviet activities in the Arctic and Antarctic.

## Soviet plans to ski to South Pole

Two Soviet teams plan to ski to the South Pole next season. A women's group of 12 former cross-country skiers, which includes psychologists, doctors, and engineers, has announced its intentions in Moscow, and members of a men's group which reached the North Pole on skis in 1979 is already in Antarctica.

When the Pioneer Estonii sailed from Leningrad last year in support of the 28th Soviet Antarctic Expedition her passengers included members of the North Pole ski expedition sponsored by the newspaper Komsomol'skaya Pravda, and the leader, Dimitri Shparo, who is a Moscow University physicist

and veteran of many polar journeys in the Soviet Antarctic. The North Pole expedition of seven, described as sporting and scientific, left Ostrov Genrietta, an island in the East Siberian Sea on March 16, 1979, and skied over 1500km of sea ice to the North Pole where it arrived on June 1 after 78 days' travel.

Soviet reports have not indicated the exact routes the skiers follow to the South pole. Valentina Kuznetsova, leader of the women's group, says their line of route will be to a zone where a Soviet expedition is working.

This group is reported to have gained considerable experience on six high-altitude expeditions. The women used

tents on these expeditions, carried 50kg packs, and pulled the rest of their baggage on small sledges. Valentina Kuznetsova claims her team will be able to cover 800 to 1200kms in six to eight weeks. The North Pole team averaged about 20km a day.

A Soviet tractor train which reached the South Pole in 1959 left Mirny on September 27 and arrived at the Amundsen-Scott South Pole Station on December 26. It covered a distance of 2687km.

This is not the first time Soviet women

have said they would ski to the Pole. In 1974 "Komsomol'skaya Pravda" reported that a group of women known as Metelitz (Snowstorm) planned to make a ski journey of 1609km from Vostok to the Pole in 50 days.

In 1974 the women intended to dedicate their expedition to International Women's Year which had been designated for 1975 by the United Nations. International Women's Year was duly observed; no Soviet women reached the Pole on skis or any other way.

## Lindblad Explorer to cruise in Ross Dependency

Between November and March next year the Antarctic cruise ship Lindblad Explorer will make four voyages to Antarctica. Her last cruise will be to the Ross Dependency, and her Antarctic and sub-Antarctic cruise programme will end at Lyttelton.

During the summer the Lindblad Explorer will take tourists to the Antarctic Peninsula area, and to South Georgia, the South Shetlands, and the South Orkneys. For the last three cruises passengers will fly from Santiago, Chile, to join the ship at Punta Arenas, the Chilean port of Tierra del Fuego. The first cruise will start from Montevideo, Uruguay.

On the first cruise the ship will leave Punta Arenas on November 19 for the Falklands, South Georgia, the South Orkneys, and the Antarctic Peninsula. Weather and ice permitting, passengers will go ashore at Port Stanley, Carcass, West Point, and New Islands in the Falklands. The South Georgia section of the cruise will include calls at the Bay of Isles, Stromness, Grytviken, and Royal Bay.

Calls will be made at Laurie and Coronation Islands in the South Orkneys. In the Antarctica Peninsula area the ship will visit Admiralty Bay, King George Island in the South Shetlands, Paradise Bay, Port Lockroy, Anvers and Decep-

tion Islands and Hope Bay. The ship will return to Punta Arenas and the cruise will end at Santiago on December 13.

Between December 14 and January 5 the Lindblad Explorer will follow the same programme on her second cruise. The third cruise will visit the same areas also, starting on January 6 from Punta Arenas and returning there on January 28.

On the final cruise from South America to New Zealand the Lindblad Explorer will leave Punta Arenas on January 29. After visits to Admiralty Bay, Deception Island, Paradise Bay, Port Lockroy, and Anvers Island, she will sail for the Bellingshausen Sea.

After cruising past Peter I Island the ship will enter the Amundsen Sea and then proceed round the coast of West Antarctica into the Ross Sea. She will cruise off the Ross Ice Shelf to McMurdo Sound. Passengers will go ashore at Cape Royds and Cape Evans to visit the historic huts on Ross Island, providing ice and weather are favourable, and also call at McMurdo Station and Scott Base.

When the Lindblad Explorer leaves McMurdo Sound she will cruise north off the coast of Victoria Land, and possibly call at Cape Hallett and Cape Adare. She will pass the Balleny Islands and then begin the sub-Antarctic section of the programme.

## Plan to manhaul sledges to Pole

Two Englishmen hope to manhaul sledges 1365km from Cape Evans to the South Pole next year summer to recreate Scott's journey in 1911-12. They are Robert Swan, a 27-year-old tree surgeon and self-styled professional explorer, and 32-year-old Roger Mear, a professional mountaineering instructor. Both had Antarctic experience in the 1980-81 season with the British Antarctic Survey at Rothera on Adelaide Island off the Antarctic Peninsula and Fossil Bluff in George VI Sound.

Present plans are for the two men to fly to McMurdo Sound from Christchurch in a chartered Hercules aircraft on October 25. They intend to leave the historic hut at Cape Evans on November 1, the same date on which Scott began his southern journey 72 years ago, and hope to arrive at the Pole on January 17 next year, conforming as closely as possible to Scott's itinerary and his arrival date (also January 17). Their proposed route is across the Ross Ice Shelf and up the Beardmore Glacier to the Polar Plateau.

No advance depots will be established along the route, and the two men will have no air support on the journey although they will be in radio communication with McMurdo Station and Scott Base. Each of the two sledges will have a load of about 161kg. This includes about 98kg of food, 14kg of fuel, 32kg of equipment, and 15kg of personal gear. The weight on each sledge will drop about 1.5kg daily which means that each man will be hauling about 130kg up the Beardmore Glacier, and 87kg over the last 321km to the Pole.

Swan expects the expedition will cost NZ\$180,000, two-thirds of which will be needed to charter the Hercules aircraft which will fly the two men and a film crew from Melbourne to Christchurch, and then to McMurdo Sound to begin the journey. Much of the money has been raised with grants and sponsorship of equipment the men will use. Swan and Mear will make a film on their way to the Pole, and there is also a book planned.

One problem still to be solved is

transport back to McMurdo Station if the two men reach the Pole. When Swan left New Zealand in April he flew to Washington to discuss with the United States National Science Foundation an offer of about 10 tonnes of cargo space on the chartered aircraft's flights between New Zealand and Antarctica. In return Swan and Mear want to be brought back from the Pole with some of their equipment by a United States Navy ski-equipped Hercules.

If the National Science Foundation does not agree to the proposal the expedition will not proceed this year. But Swan has said publicly in New Zealand that the journey may be made in the 1984-85 summer even if he has to make his own arrangements to be picked up by an aircraft from the Pole.

Although Swan and Mear began planning their expedition while they were at Rothera, the idea of recreating Scott's journey originated with Swan after he had read polar history while studying for his B.A. degree in ancient history at Durham University. Since then he has gained Antarctic experience, spent six months cross-country ski-ing in northern Norway, and climbed in Wales, the European Alps, the Andes, Antarctica, and New Zealand. He cycled from Cape Town to Cairo in seven months when he was 19, and has taken part in a Royal Navy expedition to Mt Kenya.

Mear, who has a B.A. degree in fine arts, is now an instructor at the British National Mountaineering Centre in Wales. He has climbed in Europe, the Himalaya, South America, Alaska, and Antarctica.

## SUB-ANTARCTIC

# Heard Island expeditions' varied fortunes

Two private Australian expeditions worked on Heard Island, the isolated sub-Antarctic island in the Indian Ocean 4000km south-west of Perth, in January and February this year. One sailed there in a 25m ocean-going ketch, *Anaconda II*; the other used a converted whale chaser, *Cheynes II*.

Both expeditions included scientists, amateur radio operators, and mountaineers, and had two main objectives — to attempt the second ascent of Big Ben, the island's 2743m active volcano, and to make contact with thousands of radio "hams" all over the world. The Heard Island Expedition was a success; the Heard Island DX Association expedition came close to ending in disaster.

Fourteen men and four women left Hobart on January 6 for Heard Island aboard the *Cheynes II*, which had been chartered by HIDXA. Members of the expedition were drawn from Australia, Britain, the United States, Austria, and Norway. They expected the voyage of 3500 nautical miles to take 35 days. Instead it took 66 days.

Consistently bad weather and a series of mishaps slowed the progress of the *Cheynes II*. She reached Heard Island, but on the return voyage the old ship ran short of fuel when she was 750nm from Albany, Western Australia. To conserve fuel the ship was under sail for 13 days, using one sail plus several made from a truck tarpaulin. With this emergency rig the *Cheynes II* sailed 833nm in 309 hours at an average speed 2.4 knots — a record for a steam vessel under sail.

Arrangements were made for another ship, the *Saxon Onward*, to meet the *Cheynes II* with 30 tonnes of fuel about 540nm from Albany. But heavy weather delayed the *Saxon Onward*, and the *Cheynes II*, having used nearly all her steaming fuel to reach the rendezvous, had to shut her engines and rig her sails again.

When the ships met the sea was too rough for refuelling, and the *Saxon Onward* had to take the *Cheynes II* in tow.

It took seven days to tow the unlucky expedition ship to Albany where she arrived on March 16. Everyone aboard had to live on baked beans and tinned tomatoes during the last few days, and there was only enough food for three days when the expedition ended.

## FUEL PROBLEMS

With Mr Bob Barnett, owner of the *Cheynes II* as skipper, the expedition left Hobart on January 6, taking the southern route to Heard Island. The ship was forced to turn back only 80nm out after consuming huge quantities of fuel plugging into gales which reduced her average speed to about two knots.

While the ship was being refuelled in Hobart Mr Barnett left the expedition and appointed a freelance ship's master, Mr Laurin MacEwan, as skipper in his place. The *Cheynes II* sailed again on January 9, this time on the northern route to Heard Island.

Three days later 300nm from Hobart fuel consumption figures showed that the *Cheynes II* would be unable to make a direct trip to Heard Island. A detour of 1000nm was made to refuel at Albany. Steaming tests on the way convinced the skipper that the ship could make the trip from Albany to Heard Island and back on only 80 per cent of her stored fuel.

On January 18 the Cheynes II reached Albany, refuelled, and sailed two days later. She made good progress until January 31 when she began to run low on fresh water for her boilers, and was forced to make another diversion to Iles Kerguelen to refill her water tanks at the French research station there.

Fresh fuel consumption calculations showed that the ship could reach Heard Island but would have to sail part of the way back to Albany to conserve fuel stocks. Expedition members were determined to go on, and the Cheynes II which had reached Iles Kerguelen on February 2, sailed the next day after taking on water.

### MILD WEATHER

Almost one month after leaving Hobart the expedition reached Heard Island on February 5 and stayed there for 12 days. Unusually mild weather on nine of the 11 days spent on the island enabled the expedition's four scientists to complete their studies. ("Antarctic," March, 1983, p. 41). The mountaineers and the amateur radio operators had less success.

An Austrian-Australian mountaineering group attempted to climb Big Ben by the untried western approach. But daytime temperatures were between six and eight degrees Celsius. As a result the mountain was very wet, and there was a constant danger of avalanches.

Amateur radio operators made contact with 14,500 "hams" in 138 countries, but the figure was about 25,000 less than hoped for originally. The operators were hampered by atmospheric and interference from other signals.

During the expedition's last two days on the island a heavy storm blew up and the Cheynes II used extra fuel to keep off the shore. She left the island in heavy weather on February 17, and after two days and a half of steaming back to Albany the skipper confirmed that she did not have enough fuel to make the 1500nm to port.

Sails were rigged, engines were shut down, and the Cheynes II continued under sail on February 20. After Mr

Barnett had been advised on February 23 of the lack of fuel arrangements were made by radio on March 1 for the two ships to rendezvous for the transfer of fuel so the Cheynes II could reach Albany under her own steam.

But the ship's troubles were not over. The engines were restarted so she could steam to the rendezvous. On March 7, however, sails had to be hoisted again because fuel was running low, the Saxon Onward had left Hobart two days later than intended, and her speed had dropped to five knots instead of the expected 10.

Two days later the Saxon Onward reached the Cheynes II. The weather was too rough for safe refuelling, and the expedition's last seven days were spent at the end of a tow line.

### RADIO CONTACTS

By contrast almost everything except the weather seemed to favour the Heard Island Expedition, which completed most of its objectives while it was on the island from January 21 to February 21. In spite of gales which flattened base camp tents, blizzards, and temperatures well below zero, four men and one woman climbed Big Ben, scientific projects were carried out, and the amateur radio operators made contact with 30,500 other "hams" in 150 countries.

Led by Dr Ross Vining, a 33-year-old Sydney medical research scientist, and William Blunt, a 28-year-old architect and mountaineer, also from Sydney, the expedition left Perth for Heard Island on December 31. The 20 members aboard the Anaconda II included 18 men and two women, Pauline English, a Bendigo school-teacher, and Meg Thornton, who is an architect like her husband William Blunt.

When the Anaconda II reached Heard Island on January 21 the expedition established its base camp in Atlas Cove, site of the 1947-55 ANARE station. Research projects in geophysics, glaciology, and terrestrial biology were started, and the two amateur radio operators began the DX project.

An advance base camp was established on Skua Beach in Spit Bay at the eastern end of the island for the mountaineering team's attempt to climb Big Ben, a mountain first conquered by three New Zealanders and two Australians in January, 1965. ("Antarctic," December, 1982). The five climbers were William Blunt and Ross Vining, an Adelaide mountaineer and photographer, Jonathan Chester, Martin Hendy, a glaciologist who has worked in Antarctica at Casey Station, and Pauline English.

### TWO ASSAULTS

Big Ben dominates Heard Island which is almost completely covered by crevassed ice. The volcano rises to 2743m and its crest a filled-in volcanic crater surrounded by blizzard-shrouded peaks of which Mawson Peak (2746m) is the highest.

In the first week of February the mountaineers left their Shag Beach camp to begin the ascent. Two assaults were needed before the team reached the summit of Mawson Peak on February 9. The day was cold and misty when Jonathan Chester and Martin Hendy proudly held an Australian flag between them for cameras to record only the second ascent since 1963.

After tents were almost blown away during the climb the team had to build a large ice cave which was used as the base for the main assault. When the team reached the summit of Mawson Peak it had to sort out the highest point from a jumble of rocky plinths before the flag could be raised. Gear was soaked by steam from the volcano near the summit, and on the difficult descent icy winds, snow, and low temperatures fogged the climber's goggles and turned their sodden clothing into frozen suits of armour.

Because of the stormy weather — one storm blew the Anaconda II 10km out to sea when the anchor rope snapped — and lack of time, the expedition was unable to circumnavigate Heard Island as planned or land on the small rocky McDonald Islands to the west. But before the ketch headed north on

February 21 Ross Vining made the first landing on Shag Island, a tiny bare rock only a kilometre square. He was swept into the sea by a huge wave when he tried to help Jonathan Chester ashore.

Both men did better the second time round. They climbed 100m to the top of the rock, raised their flag, and formally claimed the island for Australia. Their action was unnecessary; Heard Island and its bits of rock have been an Australian possession for many years.

Anaconda II had an uneventful voyage back to Port Adelaide where she arrived on March 9. As she has been sailed south by her South Australian owner, Josko Grubic and a professional crew of three, and the expedition's co-leaders were both from New South Wales, newspapers in Adelaide and Sydney gave more space than others to the expedition's achievements.

## Conservation of seals

Fewer Weddell seals have been killed this year to provide winter food for the 21 huskies at Scott Base. This has been done to maintain conservation of the seal population in the McMurdo Sound area. Thirty-six seals were killed early this year compared with 52 last year. Also additional dog feed has been shipped from New Zealand.

Under the Antarctic Treaty's Agreed Measures for the Conservation of Antarctic Flora and Fauna permits can be issued for the killing of limited quantities of seals in the treaty area to provide indispensable food for men or dogs, and for scientific purposes. New Zealand strictly controls the issue of permits for scientific projects, and for feeding huskies. The numbers of seals killed in recent years to feed the base huskies has been minimal in relation to an estimated population of many thousands in the Western Ross Sea.



## Antarctic Conservation Trophy to N.Z. biologist

A New Zealand biologist, Graham Wilson, who has studied penguins, seabirds, and seals in Antarctica and the sub-Antarctic since 1969 has been awarded the New Zealand Antarctic Society's Conservation Trophy for 1983 — an Emperor penguin carved in walnut. Mr Wilson, of Christchurch, has worked on the Snares and Auckland Islands, and has spent six summers in Antarctica, mainly at Cape Bird on Ross Island. He has also worked at Cape Hallett and Cape Adare on the coast of Northern Victoria Land.

There have been nine previous awards of the trophy since 1972. It is awarded to any person or organisation contributing significantly to any aspect of Antarctic or sub-Antarctic conservation — preservation of flora and fauna, historic buildings, sites, artefacts, and the natural features of the continent and islands.

Mr W. Hopper, president of the society, who announced the award, said that Professor G. A. Knox, chairman of the New Zealand National Committee for Antarctic Research, and Mr R. B. Thomson, director of the Antarctic Division, Department of Scientific and Industrial Research, agreed that Mr Wilson's work since 1969 came within the criteria for the award of the trophy. They considered that his research has been a valuable contribution to the preservation and conservation of Antarctic and sub-Antarctic fauna.

Mr Wilson, who gained his M.Sc. degree from the University of Canterbury, spend the 1969-70 and 1970-71 summers on the Snares Islands as a research assistant to Dr John Warham and studied sooty shearwaters. In the 1972-73 summer he worked on Enderby Island, one of the Auckland Islands, to obtain material for his master's thesis on the New Zealand fur seal. Between 1971 and 1974 he studied fur seals in colonies all round New Zealand.

In the 1977-78 season Mr Wilson made his first trip to Antarctic and worked with the University of Canterbury biological research unit at Cape Bird. He continued his observations of

Adelie penguins, birds, and whales, at Cape Bird each season, and was concerned with the conduct of the annual censuses of penguin rookeries at Cape Bird and Cape Royds.



On his way back from Antarctica in the 1980-81 season when he worked at Cape Bird and Lake Fryxell in the Lower Taylor Valley Mr Wilson acted as an observer for the International Survey of Antarctic Seabirds (ISAS). He was a passenger aboard the Benjamin Bowring, support ship for the Transglobe Expedition.

Early in the 1981-82 season Mr Wilson worked at Cape Bird again on the annual penguin census. He returned to New Zealand and went south again aboard the United States Coast Guard icebreaker Glacier with a party which was landed at Cape Adare to study the historic buildings there and do other research. On the voyage Mr Wilson made observations of pelagic birds for ISAS, and during his stay of five weeks at Cape Adare he carried out a census of

the Adelie penguin rookery there.

Last season Mr Wilson led an ornithological research team which worked for nearly five weeks at Cape Hallett where a joint U.S.-N.Z. station was established in 1957 and closed as a summer station in 1973. The party's programme was planned as part of New Zealand's contribution to ISAS. It included seabird observations from the Glacier, and a census of the Adelie penguin rookery — the first to be made since 1967.

## OBITUARIES

# English veteran of Byrd expeditions

An English veteran of Byrd's first two Antarctic expeditions, Captain Alan Innes-Taylor, who was also an authority on cold weather survival techniques, died in Whitehorse, Yukon Territory, Canada, in January this year. He was 82. His Antarctic experience on the 1928-30 expedition was confined to a stormy voyage south aboard the City of New York with 13 extra sledge dogs, and assisting in the hurried evacuation of Little America I. But he was Byrd's chief of trail operations for the 1933-35 expedition and was in charge of all dog teams and transport.

In the June, 1980 issue of "Antarctic" we reported in error that Alan Innes-Taylor had died in 1979 at Anchorage, Alaska. The report was based on information given to the editor of the Antarctic Society's newsletter by another Byrd veteran.

Rather than repeat all of the original obituary notice we give some additional details of the adventurous career of Innes-Taylor before he joined Byrd's first expedition, and of his later life. He still remembered by some New Zealanders because he arrived in Dunedin too late to join the Eleanor Bolling on her second voyage to the Bay of Whales. When the expedition's funds ran low he took 13 dogs to Mt Cook and earned part of their expenses by using them for transport. He took them south finally early in 1930.

Innes-Taylor was born in Berkhamstead, England, and came to the United States with his parents in 1906. When his parents moved to Canada he learned to

fly in the closing stages of the First World War. His pilot's licence issued by the Federational Aeronautique Internationale was No. 434.

After the war Innes-Taylor joined the Royal Canadian Mounted Police and served in the Yukon and British Columbia from 1921 to 1926. He was a veteran dog driver when he first went south.

In the years before the Second World War Innes-Taylor followed a variety of occupations. He managed a Canadian laboratory for the study of animal diseases, ran a beaver farm, carried freight by dogsled and canoe in the Arctic, and was a steamboat purser.

By special Act of Congress he was commissioned in the United States Army, and commanded special operations to train mountain troops and commandoes in Greenland, Canada, and the United States. He also developed field survival techniques in the Arctic for the United States Army and Air Force, and reached the rank of lieutenant-colonel.

In 1948 Innes-Taylor was in charge of the joint United States-Canadian weather station on Isachen Island in the Canadian Arctic. He also acted as a consultant to Scandinavian, Dutch, and French airlines when the air route over the North Pole was established.

Innes-Taylor was awarded Canada's highest civilian decoration, the Order of

## Former Antarctic Division officer

A former executive officer of the Antarctic Division, Mr H. M. McDonald, died this month aged 67. He became executive officer when the Antarctic Division was transferred from Wellington to Christchurch in 1970, and held the position until 1976 when he retired.

Harry McDonald, who came from Christchurch, went to the Second World War as a second lieutenant with the 28th (Maori) Battalion. He was captured during the fierce fighting on Crete for

Canada, and the Yukon Territory Commissioner's Medal. He also received the two medals awarded to the members of Byrd's first two expeditions by the United States Congress, and in 1937 was awarded the Carnegie Hero Medal for saving the life of an old woman who fell overboard from a ferry boat.

possession of the Maleme airfield, and was a prisoner of war from June 1, 1941 until the war in Europe ended.

After the war Harry McDonald joined the Regular Army, and later was seconded to the Fiji Infantry Regiment with which he served in Malaya. When he retired he joined the Public Service. He was senior office inspector at the Department of Scientific and Industrial Research head office before he came to Christchurch.

# THE READER WRITES

Sir,

In the latest edition of "Antarctic" (Vol. 9, No. 12, p. 423) the statement is made that compasses could not be used on a tractor trip from Scott Base to the dry valleys coast because "the South Magnetic Pole is too close".

This is incorrect. Both astro and magnetic compasses are used in Antarctica, and the Kelvin-Hughes sapphire pivoted prismatic compasses at Scott Base are excellent for the purpose.

It is true that the variation part of compass error is large in Antarctica, but this may be allowed for in exactly the same way it is allowed for at lower latitudes.

It is also true that, due to the large dip angle in polar regions, the force which turns the compass card is less than the force that tilts it. This causes the card to turn rather sluggishly but does not impair the usefulness of the compass. — Yours etc,

GARY H. LEWIS

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## Long drift by card

A drift card released in the 1980-81 season from the research and supply ship *Agulhas* during its voyage from Cape Town to Sanae, the South African National Antarctic Expedition base in western Queen Maud Land, found its way to a New Zealand beach 7821 nautical miles and nearly two years later. The card was one of 20 set adrift on January 25, 1981, at 50deg 22min S/05deg 38min/E.

On December 28 last year Mr Graeme Richardson, of Palmerston North, found the card on Foxton Beach about 8km north of the Manawatu River mouth. A Palmerston North fisheries officer, Mr H. R. Thatcher, advised the South African Director of Fisheries Research, who forwarded details about the card.

# 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.

# 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.

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