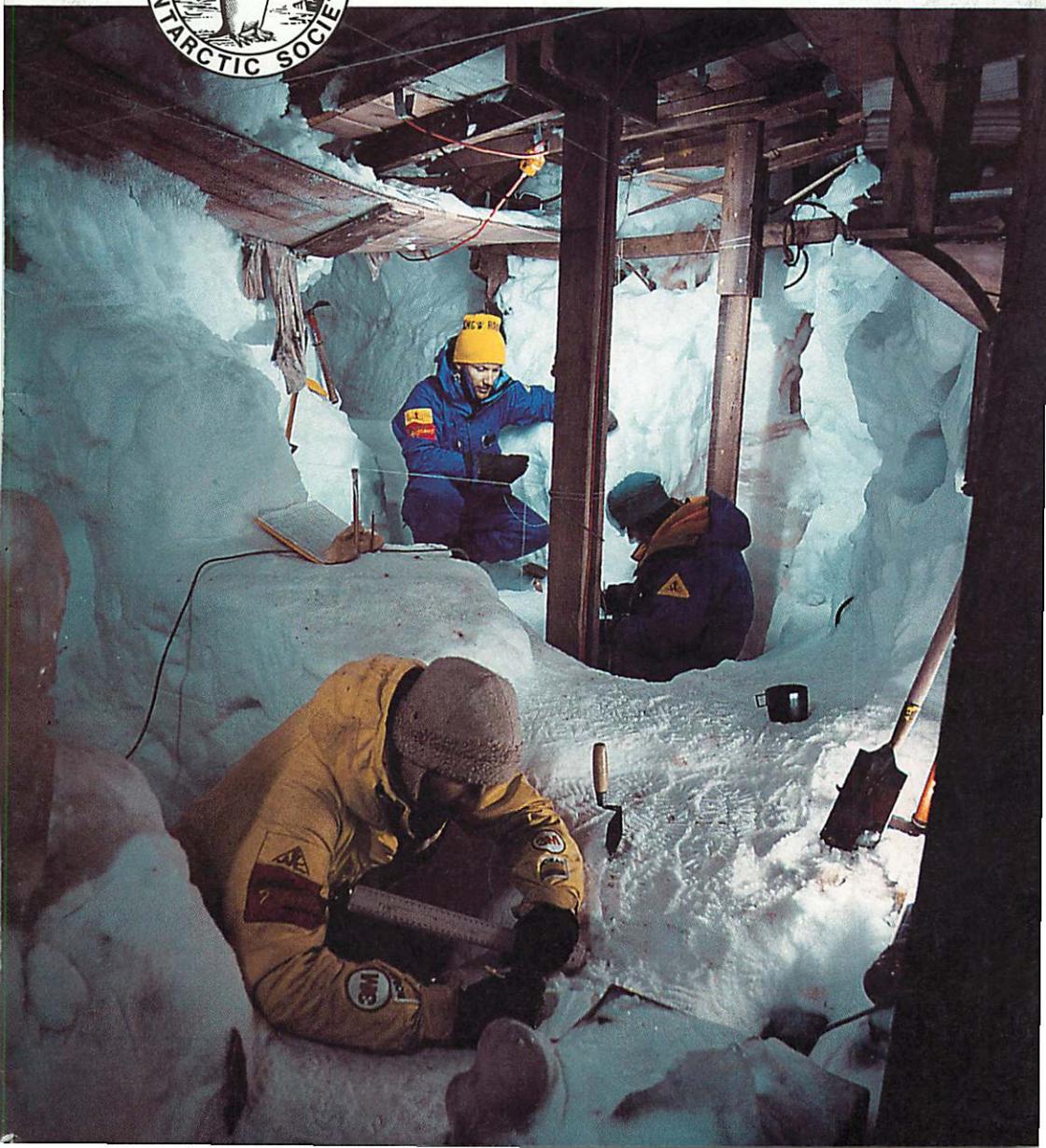
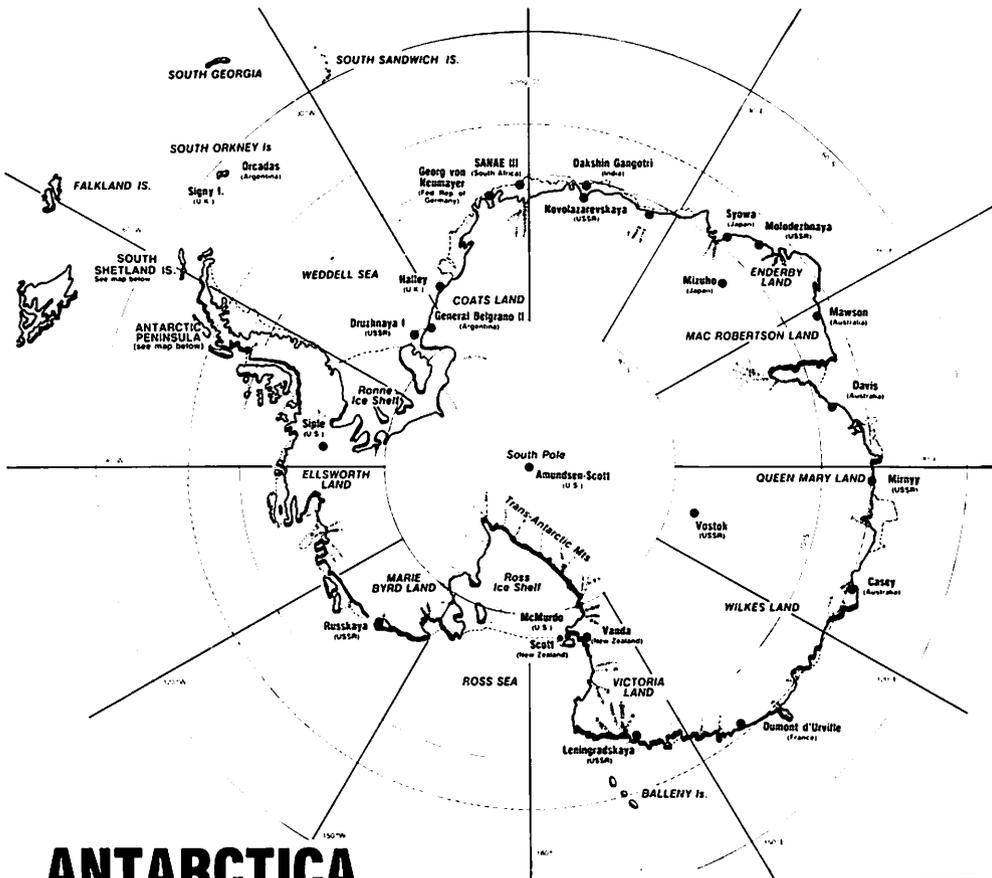


# ANTARCTIC

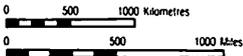


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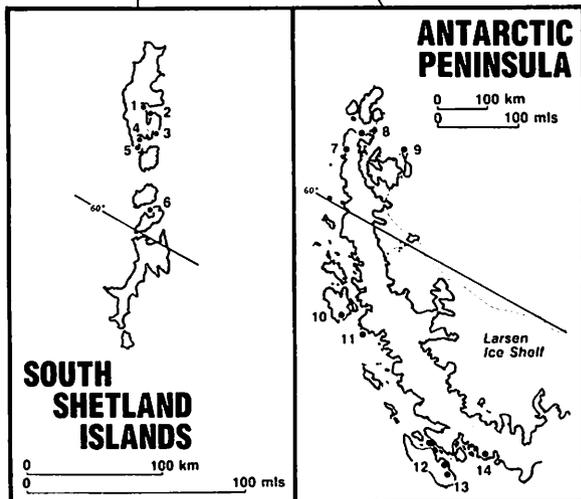




# ANTARCTICA



- 1 Comandante Ferraz BRAZIL
- 2 Henry Arctowski POLAND
- 3 Teniente Jubany ARGENTINA
- 4 Artigas URUGUAY
- 5 Teniente Rodolfo Marsh CHILE  
Bellingshausen USSR  
Great Wall CHINA
- 6 Capitan Arturo Prat CHILE
  
- 7 General Bernardo O'Higgins CHILE
- 8 Esperanza ARGENTINE
- 9 Vice Comodoro Marambio ARGENTINA
- 10 Palmer USA
- 11 Faraday UK
- 12 Rothera UK
- 13 Teniente Carvajal CHILE
- 14 General San Martin ARGENTINA



# ANTARCTIC

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NZARP

## Heavy science programme completed

Forty research projects covering a wide range of atmospheric, earth and life sciences have been approved by government for the 1986/87 season of the New Zealand Antarctic Research Programme. They include a continuation of the CIROS (Cenozoic investigations in the Western Ross Sea) during which it is hoped to obtain core samples which should complete a record of sedimentation in McMurdo Sound from the present day through to pre-glacial times and provide important information on past changes in world climate and the history of the Antarctic ice sheet.

CIROS is sponsored jointly by Victoria University of Wellington, and the Geophysics and Antarctic Divisions of the Department of Scientific and Industrial Research. They are just two of the Government departments which will participate in next season's programme in addition to six universities.

Scott Base reconstruction programme will involve the completion of a light workshop complex erected last year and the construction of a new garage complex with an area of some 1,000 sq. metres. This represents the seventh stage of the project begun in 1976 and due for completion in 1990. Work will, as usual, be undertaken by Antarctic Division, the Ministry of Works and Development and New Zealand Army Engineers.

Last season's activities officially concluded at 3pm on February 8 when the outgoing summer leader Peter Cresswell handed over to Jim Rankin of Kumara who will be officer in charge for this, his third winter on the ice and second as leader.

The last of the summer team to leave Antarctica included deputy leader at Scott Base John Parsloe and the team at Hallett Station who returned to McMurdo on USCGC Polarstar and flew home to Christchurch on 19 February leaving twelve men at Scott Base for the long Antarctic winter.

This year the party includes Mr G.B. Crocker of Cambridge. It is the first time a foreign scientist has wintered with the New Zealanders since 1959.

The New Zealand team comprises C.R. McDonald, assistant base engineer (Tokoroa), R.W. Paterson, technician (New Plymouth), D. Wilkinson, technician (Wellington), M.J. Harman, technician (Wellington), B.D. Hiscock, mechanic (Temuka), S.C. Pardoe, electrician (Napier), S.M. Loney, postmaster (Alexandra), P.S. Purves, Post Office technician (Hamilton), S.J. Mosley, chef (Auckland) and R.A. Balm, dog handler (Arthurs Pass).

The departure of the last of the summer team concluded a successful season for the New Zealand Antarctic Research programme which involved 41 scientific projects and number of supporting programmes.

### Ecosystems

Drs Warwick Vincent and Clive Howard-Williams of the Taupo Research Laboratory, Division of Marine and Freshwater Sciences, DSIR completed the third and final season of study of the stream ecosystems of the McMurdo Sound area.

The team accompanied by Gillian S. Wratt, an Antarctic Division field assistant,

spent 13 weeks in the field working from bases near Lakes Fryxell, Vanda and Miers and on the Wolcott Glacier. They focussed on experimental assays to determine the factors controlling microbial growth in Antarctic streams.

Detailed photosynthetic and respiratory measurements made with a portable infrared gas analyzer showed that the various stream communities had different light requirements for optimal growth. A nutrient enrichment assay, using equipment developed for Arctic streams, demonstrated that the stream life was not limited by nitrogen or phosphorous supply.

A wide range of biochemical assays including bacterial DNA synthesis, lipid production, photosynthetic and product biosynthesis and glucose metabolism showed that the stream algae and bacteria though tolerant of the cold water temperatures (0 to 5 deg c), were not especially adapted to these conditions.

Gillian Wratt completed a series of algal, bacterial and nitrogen cycling assays on Lakes Bonney and Vanda.

Additional work in this programme was carried out on the Alph River which flows down the western margin of the Koetlitz Glacier, and which is perhaps the southernmost flowing water system in the world. The environmental survey of the Alph River revealed a biologically rich microbial community and an unusually constant discharge (about 1 cu.m per second) by comparison with other southern Victoria Land streams.

A preliminary survey of the physical, chemical and biological properties of the McMurdo Ice shelf meltwater pools and streams was conducted early in the season, and again in mid-January.

## Trace metals

Samples of the waters of Lakes Fryxell, Vanda and Bonney were to be tested for the presence of trace metals by scientists from Auckland University Chemistry Department who sought to determine the biological — metal interaction of the biological community in the lakes. Preliminary analy-

sis by Dr Stephen de Mora, Stuart Campbell and Alan Grout was prevented by instrument problems and data on samples returned to New Zealand is not yet available.

From atmospheric measurements at Vanda they found lead to be below detection limits and the levels of volatile mercury to be less than a quarter of the New Zealand values.

## Trace gas analysis

Further samples of air were collected for trace gas analysis by Dr Tom Clarkson and technician Keith Rodgers of the Meteorological Service in Wellington. This was an extension of the work begun as a pilot study last season to determine the presence of man-made gasses — fluorocarbons and hydrocarbons — in the Antarctic atmosphere. It is part of a project to increase the understanding of global climate.

Crucial to the study is the building up of an atmospheric profile which involves collection of samples from varying heights. Using a pump powered from the helicopter air is sucked into stainless steel canisters through a tube attached to the helicopter. *Keith Rodgers taking air samples from a United States Navy helicopter as part of the atmospheric trace programme.*

Photo: Antarctic Division, DSIR



skid. In the laboratory the air is injected into a gas chromatograph and the gases separated.

Eight flights were made in December and January; two up to 15,000 ft., on each of which nine samples were collected and six to between 8 and 10,000 ft. on which an average of seven samples were collected making a total of 60.

The scientists, were looking particularly for Freon 12, a fluorocarbon used in aerosol cans and as a refrigerant. Preliminary investigations undertaken with newly installed equipment at the Scott Base laboratory indicated an approximate 5 percent increase, since last year, in fluorocarbons which is in keeping with global trends. Other samples brought to New Zealand will be further analysed for fluorocarbons and also for the presence of hydrocarbons. This latter part of the study is believed to be the first of its kind in Antarctica.

## Radiation monitoring

Routine daily climatic recording of direct and diffuse solar radiation, wind, temperature pressure and atmospheric turbidity were maintained at Scott Base by Don Wilkinson, of Wellington, as part of a year round meteorological programme. New solar radiation monitoring equipment, which will record global, direct and diffuse radiation, was installed on the northern end of the laboratory by John Falconer who also carried the routine inspection of equipment.

Mike Bourke of Invercargill maintained the synoptic observation programme at Vanda throughout the summer. This also involved collection of data from the three screens at Lower Bull Pass, Lower Wright Valley and the Western end of Lake Vanda.

## Ross Island loading

Investigation of the tectonic effect associated with the loading of the lithosphere by the young volcanic massif of Ross Island was undertaken by Drs Tim Stern and Fred

Davey. Both are from the Geophysics Division of DSIR in Wellington. They were joined by Georg Delisle from the Federal Geological Survey, West Germany and assisted in the field by Brian Smith of Antarctic Division, Christchurch.

The loading of the crust by young volcanic massif has been studied in the Hawaii area. There, beneath the extruded volcanics, the lithosphere (crust) is deflected downwards beneath the load and there are compensating upwarps at 200 to 300 km from the centre of the load, like an elastic plate underlain by a weak fluid. Unlike Hawaii, however, where the oceanic lithosphere is relatively undisturbed, the Ross Island archipelago has erupted into a region of crustal complexity.

It is thought that the Transantarctic Mountains front represents some sort of suture zone between east and west Antarctica with east Antarctica being a high standing region to the geographical west of McMurdo with an estimated crust thickness of 40 km. East of McMurdo it may be as thin as 24 km. Thus the area 100 to 200 km west of this is one of transition of crustal types. Data already collected west of Ross Island confirms this but to the east and the area particularly around the Ross Island archipelago information is sparse.

The team sought this year to continue the seismic depth sounding in the Windless Bight area to outline the "moat" on the eastern side of Ross Island, and to carry out seismic reflection surveying in the Windless Bight area in order to obtain a clearer picture of the sediment structure. This involved a 200 km traverse from Cape Crozier along a south east Azimuth during which gravity and depth sounding measurements were made at about 10 km intervals. They also took seismic reflection measurements at selected positions approximately 50 km apart. The purpose was to outline the long-wavelength deformation associated with the loading of Ross Island.

Initial interpretation of the data shows a typical flexure profile with a downward deflection of approximately 2 km.

The team then conducted a detailed gravity survey around the summit caldera

of Mt Erebus in order to estimate the total mass of the volcanic load. Results are still being analysed.

### Seismic studies

Two Japanese scientists spent six weeks at Scott Base examining recordings of the seismic events which occurred around Mt Erebus from February to December, 1985. Dr Satoshi Miura and Dr Mamoru Yamada of Tohoku University were assisting the Japanese National Institute of Polar Research with its participation in the International Mt Erebus Seismic Study (IMESS) programme involving scientists from Japan,

United States and New Zealand. It was the first year that Scott Base has hosted the Japanese IMESS scientists.

Drs Miura and Yamada played back about 1500 seismic events, recorded at Scott Base and noted the arrival time of each at the nine stations in the summit area of the mountain. From this they are able to compute the hypocentre of the events and estimate the shape of the magma reservoir beneath Mt Erebus and the driving force of volcanic activity.

During the six weeks they spent at Scott Base about 60 seismic events, each of approximately a minute's duration, occurred on Mt Erebus. The pair also carried out

## *Changes in new Antarctic map*

*A new map of Antarctica which appears in this issue, has been prepared to show the changes that have taken place since the map it replaces was first printed 10 years ago. Since 1975 more permanent bases have been established inland and on the coast of the continent, some bases have been closed, and others on slowly moving ice shelves have been rebuilt on safer or permanent sites.*

*Thirteen Antarctic Treaty nations now have bases which are manned all the year round. Three others — the People's Republic of China, Brazil and Uruguay — have established summer stations in the last three years and intend to make them permanent. Two nations, Norway and Belgium, which were among the 12 original signatories of the Antarctic Treaty, do not maintain permanent bases.*

*Since the 1975 map was drawn West Germany has established a permanent base on the Weddell Sea coast, Japan has built an inland winter station called Mizuho, and the Soviet Union has added to its coastal station Russkaya in West Antarctica. One of the new arrivals on the scene is India, which has a permanent inland base,*

*Dakshin Gangotri, in East Antarctica.*

*One of the problems in producing a small-scale map has been to show in greater detail bases in the Antarctic Peninsula and to identify them more clearly by name and nation. It has been difficult to fit into such a map the intense concentration of bases on King George Island in the South Shetlands where seven countries are now established.*

*Antarctica was shown on the 1969 map in relation to Australia and New Zealand, and the boundaries of territorial claims by several nations were included. The two countries were removed in 1975 to show the whole continent as were the boundary lines in keeping with the terms of the Antarctic Treaty under which all claims are frozen.*

*After the 1975 map appeared some readers of "Antarctic" complained that the Antarctic Continent had been turned upside down but we were assured by a leading United States cartographer that the map was correctly placed. And here it seems only natural to look south for New Zealand, historic gateway to Antarctica for more than 250 years.*

some maintenance on the seismic stations on the mountain and made gravity measurements at 11 sites which when combined with other such data will enable a gravity anomaly map to be drawn up and estimates made of the structure under the ground including the magma reservoir of Mt Erebus.

## Ice studies

During the winter the area of Antarctica doubles due to the growth of the ice in the surrounding sea. Because this great abundance of sea ice is significant in the southern ocean energy balances the spectral transmission and scattering of the ice are important physical properties.

Based on the sea ice near Tent Island Drs Bob Buckley of the DSIR's physics and Engineering Laboratory and Joe Trodahl of the Physics Department of Victoria University spent ten days measuring the spectral transmission of light in the sea ice.

Using specially designed detectors above and below the ice they were able firstly to measure the amount of light from a 50 watt bulb shone through the ice and secondly the amount scattered back into the atmosphere. From the results they can deduce characteristic physical properties of ice such as the scattering length — the distance light travels between two scattering events — and also data about the absorption of light including that due to algae growing at the bottom of the ice.

## Strain characteristics

Studies of the strain characteristics of the sea ice and the dynamics of the Erebus Ice Tongue were continued in two phases. The first comprised Dr Bill Robinson and Arnold Heine of the Physics and Engineering Laboratory Wellington and Drs Vernon Squire and Pat Langhorne from the Scott Polar Institute in Cambridge.

Based mainly just west Tent Island further assessment of the sea-wave movements produced by running a Ford pickup truck along a four kilometre route over the

ice was compared by recording with the different strain meters designed by the Cambridge and the Wellington teams. The measurements are directly related to the load carrying capacity and length of life of the sea-ice runway.

Five passes were made by a hercules flying at 50 feet over the route so that the effects of air pressure on the sea ice could also be assessed.

Recording the elastic and plastic movement of the Erebus Glacier tongue began three years ago but it was not until 1985 that recordings were made throughout the year using the strain meters installed the previous season and transmitting data via Arrival Heights to Scott Base. This year the cable between the meters was replaced and the equipment checked.

## Penguin studies

Five factors influencing breeding success of female Adelie penguins were studied by Dr Lloyd Davis and Yolanda van Heezik of Otago University, Dr John Cockrem and Dave Ward of Ecology Division. Led by Dr Davis the team was based at the Northern rookery of Cape Bird between mid-November and mid-December.

In an attempt to assess foraging distances Dave Ward and Lloyd Davis attached miniature transmitters with epoxy resin to 10 birds. One remained on shore but nine were tracked at sea using radio telemetry from equipment on Inclusion Hill and New College Hill and experimentally by helicopter to verify transmissions. Eight of the nine birds headed north out of McMurdo Sound some going beyond 100 km. It is hoped in future to be able to use more powerful transmitters in order to more accurately assess foraging distances.

Dr Lloyd Davis injected birds with labelled water and salts. Blood samples were taken at subsequent intervals to determine metabolic rates associated with various activities. This was a continuation of work begun last season in association with Dr Brian Green (CSIRO) Australia. Blood samples were taken by Dr John Cockrem to

determine whether there were changes in the levels of melatonin which could be interpreted in terms of the circadian clock. Preliminary work on diet was also undertaken and behavioural observations were made of banded birds to assess fidelity of mates between seasons.

## Colonies counted

The aerial photographic reconnaissance of the coastline of the Ross Dependency to locate all penguin colonies and determine their populations was continued last season. Evidence obtained from the photographs is supported where possible by ground counts and used to monitor man-induced and natural environmental changes in the ecosystem. The project carried out by Ecology Division of DSIR is part of the New Zealand contribution to the International Survey of Antarctic Seabirds (ISAS) and is one of two conducted within the New Zealand Antarctic Research Programme.

Using a U.S. VXE-6 helicopter on November 27 to fly first at 3,000 and then at 2,000 feet to check for disturbance of the colonies Peter Wilson, Bruce Thomas and Tim Fitzgerald photographed three colonies at Cape Royds on their way to Cape Bird. Returning to Royds they rephotographed the colonies before landing to spend two days on a ground count.

Results indicated 3,247 occupied nests, 3,116 with eggs representing a 13 and 14 percent increase respectively on the previous year. All but one of the sub-colonies had also increased. Cape Crozier was also photographed by helicopter.

On December 4 the same team flew a C-130 mission during which the colonies at Beaufort Island, Coulman Islands — south, middle and northern — Capes Jones and Wheatstone, Cotter Cliffs, Cape Hallett, Duke of York Island, Sentry Rocks, Unger Island, Nella and Thala Islands and the Aviation Island were photographed. Conditions precluded observations and photographs of Inexpressible Island and Terra Nova Bay but two small unknown colonies

were observed at Cape Phillips and at Cape Anne on the southern tip of Coulman Island. Counting is still in progress.

In a second part of the New Zealand contribution to ISAS, Lynda Logan, John Fennell and Rachel Brown, all of Christchurch, spent two weeks in late November carrying out an annual ground census of Adelie penguins at Cape Bird. This census has run since 1965 and includes the recording of penguin band numbers and observations of other birds and animals.

## Adelies filmed

Adelie penguins at Cape Bird were filmed by a crew from Television New Zealand. This completed the second phase of a project begun in 1981 when the first stages of summer colonisation of Cape Bird was recorded. Led by Neil Harroway of Dunedin the team comprising cameraman Tim Pollard and soundman Mike Fitzgerald, both of Christchurch, captured the second part of the seasonal cycle on film due for release late this year. Some footage was also shot in the Dry Valleys for a joint BBC/ABC production.

## Viral studies

The World Health Organisation (WHO) maintains a continuing interest in the relationship between human and animal influenza virus strains. Outbreaks of the disease in seals on the North East Coast of the United States raised the question of whether they are natural hosts of the viruses or whether they were infected from birds.

This aspect of viral research was carried a step further by Drs Frank Austin, Tony Robinson from the Medical Research Council of New Zealand and guest scientist Dr Rob Webster of St. Judes Hospital, Memphis Tennessee.

At Cape Bird for one week in January and Scott Base for two weeks the team collected swabs from penguins, skuas and seals and blood samples from skuas and seals, some 500 in all. Preliminary testing

has shown that 10 percent of the skuas have antibodies indicating that they have been infected with influenza virus in the past. The birds are however only carriers; as they rarely develop the disease.

Analysis of the penguin samples to date indicates no positive isolants but between 50 and 100 will be retested. Similar testing of samples collected at an Australian base indicated previous infection.

As there is no commercially available sera for the testing of seals a special reagent is being developed. The results will be forwarded to the World Health Organisation.

## Fish studies

Working from the fish but 1.5 km south of Scott Base and in the wet lab from mid-November to late December Canterbury University scientists Dr Bill Davison, Craig Franklin, Malcolm Forster and Harry Taylor extended earlier studies of the swimming ability of Antarctic fish.

Using a specially built tunnel respirometer four species of fish were exercised. The benthic *Trematomus Bernacchii*, *t. hansonii* and *Gymnodraco acuticeps* did not readily swim in the tunnel but the fourth the Pagothenic *borchgrevenki* swam well. The sprint and endurance capacity were assessed and metabolic rates at rest, and during activity and recovery were measured. Muscle and blood samples, recovery rate, lactic acid removal and oxygen debt repayment were also recorded during the 48 hour recovery of a fish swum to exhaustion.

Between 10 and 15 percent of the fish caught were also found to have from five to a hundred percent fill damage usually running from the filament to the base. Although the cells in the gills were swollen the damage increasing the distance between blood and the source of oxygen the uptake was not affected, suggesting that it might be obtained another way.

Giant pycnogonids (sea-spiders), caught by an American scientist diving in McMurdo Sound, were subject to a pilot study by the team which measured metabolic rates, osmotic pressure and blood volume.

## Historic huts

A brief inspection of the three historic huts at Hut Point, Cape Evans and Cape Royds was carried out by David Harrowfield and Russell Skerton of Canterbury Museum and Gerry Turner of Lands and Survey Wellington. This was part of an ongoing management programme for which they prepared photographs and collected some important artefacts for temporary safe storage at Scott Base prior to further work. The collection of artefacts is in keeping with the overall long term plan for the sites as approved by the Historic Sites Management Committee which advises the Ross Dependency Research Committee.

## Drilling

A three hole drilling programme was undertaken in the Marshall Valley between January 10 and 30 to obtain suitable material for absolute age dating from the subsurface sequence and establish a chronology for pre-last glacial sediments deposited by grounded ice sheets in the Ross Sea.

The sequences, from which the late Quaternary glacial history could be studied in relation to the McMurdo Sound region thus extending the chronology of successive Ross Sea Glaciations, have been documented by investigators over the past 15 years. The Marshall Valley was chosen because of the exposed but inter-bedded nature of the glacial and proglacial deposits in the valley. Like other valleys in the region it is the site of maximum glacial advance of the Ross Ice shelf and the most complete sedimentary record of these glaciations is likely to be preserved there.

Led by Dr Chris Hendy of Waikato University and Dr Paul Robinson from the New Zealand Geological Survey the team comprised Jan Clayton-Greene and Fiona Judd also from the university and two Antarctic Division drillers Larry Weller and Warwick Potter. Surveying support was provided by Phil Winters from the Department of Lands and Survey.

The first two holes were drilled to 26.02m, with 98 percent core recovery, and 35.41m, with 93 percent core recovery, and the third was abandoned at a depth of 14.12m with 54 percent recovery because of poor drilling conditions.

Four major lithotypes were recognised in the sedimentary sequence which could represent many glacial episodes but without absolute age dating which is being carried out at present, the true number remains unknown. From preliminary results based on lithological correlation 9 separate episodes were recognisable in the subsurface from the last two being about 13,000 to 180,000 years BP respectively.

## Ciros

Preparations for the continuation of the 1984/85 CIROS (Cenozoic Investigations in the Western Ross Sea) drilling programme during next summer were completed during the season. They included repairs and extensions to the campsite buildings bringing the Longyear drilling equipment up to operating efficiency and delivering supplies of drilling mud, and fuel to the Butter Point camp. Core saw parts and scientific equipment were also sent by to Scott Base in readiness for the advance team to go in on the first of the winter flights for next season.

## New weir and dam to control Onyx

Antarctica's longest river, the Onyx, one of the few in the world to flow inland, did not behave normally all last summer. Early in December it began its 40km journey along the Wright Valley from Lake Brownworth to Lake Vanda. Its rate of flow was normal (about one to two cubic metres a second) and the waters reached the permanent weir near Vanda Station and flowed over it at 3.45 a.m. local time on December 8.

Temperatures recorded at Vanda Station had been cooler than most, but did not cause a flood, reaching discharges of eight cubic metres a second which suddenly came down the river on December 16. These high flows continued for three days. In the 1983-84 season the river did not begin its flow until December 16, which was later than normal, and by December 17 had been a torrent, reaching its highest level since the 1970-71 season.

Hydrologists from the Water and Soil Science Centre, Ministry of Works and Development, assisted by the Vanda summer staff, measure and record the river's flow and temperatures each summer as part of New Zealand's monitoring of

weather changes in the dry valleys. When the flood began the hydrological team, Trevor Chinn and Peter Mason, assisted by an Antarctic Division field assistant, Warwick Petter, moved camp to the Lower Wright Glacier, the source area of the Onyx. There they found that the flood had been caused by the breaking of an ice dam where the glacier pinches the river against the mountains of the valley side.

High flows have overtopped the present weir and caused considerable deformation and damage over the last few summers so last season a major part of the hydrological programme was to construct a new weir just upstream from the present one. It was made with an artificial notched weir surrounded by a moulded sand and rock paved dam. This was designed to handle the large flows experienced in recent years.

This year the dam will become saturated but during the winter all the damp ground will freeze permanently with only the surface rocks thawing in the summer. So after this winter the structure will become a permanent ice-cored ice dam which should never leak.

Temperatures at Vanda rose in January.

the highest for the summer being 11deg Celsius on January 7. On January 4, 1974, the temperature reached 15deg C, the highest recorded since the station was established in 1968. In January, 1979, the highest temperature for the summer was 13.2deg C.

Footnote: Hydrologists are not the only people interested in the summer flow of the Onyx. For several seasons New Zealanders have organised a sweepstake open to all comers and based on the date and time the waters of the river will flow over the weir. This summer the sweepstake was worth \$125 and the winner was Dexter Sharp, one of the crew of the Royal New Zealand Air Force Iroquois helicopter operating in Antarctica for the first time.

## Artefacts from historic huts

A glass used at Captain Scott's last birthday dinner at Cape Evans on June 6, 1911, two skis from Shackleton's Arrol-Johnston motor-car, and a porcelain ashtray advertising Bell matches, were among artefacts removed from the three historic huts on Ross Island last summer by a New Zealand team. All the artefacts were discovered and documented by New Zealand restoration parties in past seasons. They have been removed because they would deteriorate in the huts and be lost without certain conservation treatment.

Arrangements have been made to store the artefacts at Scott Base until methods of preservation which can be done only in New Zealand have been worked out. Later this year they will be brought back and the Ross Dependency Research Committee will decide where they will be housed.

A Canterbury Museum expedition which was part of the New Zealand research programme visited the huts of Scott and Shackleton at Hut Point, Cape Evans, and Cape Royds in January. It was led by the museum archivist, David Harrowfield. With him were Gerry Turner, a surveyor and resource planner with the Lands and Survey Department in Wellington and Russell Skerton, an artist-technician with the Department of Education in Christchurch.

Relics of Scott's last expedition (1910-13) and the Ross Sea Party of Shackleton's 1914-17 Imperial Trans-Antarctic Expedition, were removed from the Discovery hut

erected at Hut Point for Scott's 1901-04 expedition. A nosebag used by the last expedition's ponies or mules was found in the hut. It still contained oats and bore the initials of Charles Wright, the Canadian scientist who was first to sight the tent with the bodies of Scott and his companions.

A board inscribed "RWR April 1916" was also recovered. It belonged to Dick Richards, last survivor of the Ross Sea Party who died last year. Still to be identified is a Primus stove which may have been there for the 1901-04 expedition or Shackleton's 1907-09 expedition which also used the hut.

In addition to the car skis and the ashtray, a tin of piston lubricant in pristine condition was removed from Shackleton's hut at Cape Royds. Other relics of the Ross Sea Party were taken from Scott's hut at Cape Evans where the party lived for nearly 15 months.

One relic from Cape Evans was a combined man-dog sledge-hauling harness used during a depot-laying journey for Shackleton by the Ross Sea Party in the 1915-16 summer. It was found originally in the 1970-71 season by two New Zealand Antarctic Society hut caretakers. A string of rosary beads belonging to the Rev Arnold Spencer-Smith, padre and photographer with the Ross Sea Party, was found in Herbert Ponting's darkroom at the Cape Evans hut. Spencer-Smith, who died of scurvy on the Ross Ice Shelf in 1916, used the darkroom as a chapel.

## Scott Base huskies to be phased out

New Zealand, which has had huskies at Scott Base since 1957, has decided to phase them out over the next few years. There are now 16 at the base. Some will have to be put down because of age, injury or sickness; others will be allowed to die naturally.

In the 1957-58 season there were more than 60 huskies at Scott Base for the use of the New Zealand section of the Commonwealth Trans-Antarctic Expedition. Since then the introduction of motorised toboggans has displaced huskies from their traditional role as the main means of Antarctic transport, and the number at the base has declined from the peak to enough for two teams of nine. Now they are kept for recreation and the occasional short journey.

Four years ago Mr R.B. Thomson, director of the Antarctic Division, Department of Scientific and Industrial Research, served notice that the efficiency and cost effectiveness of the huskies would be reviewed. They could not be kept there just for the sake of tradition but if they were phased out it would be over several years.

Last season the DSIR decided that the huskies would have to go. The main reason for the decision was growing opposition to the killing of Weddell seals in the McMurdo Sound area to provide part of the huskies' daily diet.

### SEAL KILLS

Under the terms of the Antarctic Treaty, the Agreed Measures for the Conservation of Flora and Fauna, permits can be issued for the killing of limited numbers of seals to provide indispensable food for men or dogs and for scientific purposes. New Zealand permits for scientific needs and for feeding huskies have been strictly controlled since these measures came into force.

With more than 60 huskies at Scott Base in the 1957-58 season the number of seals killed rose to a peak of 350. That was before New Zealand ratified the Antarctic Treaty in 1961. Since then there has been a steady decline in the numbers killed each season, and the taking of seals has become a culling operation to conserve the population. By the 1974-75 season the number had dropped to 52. This figure was maintained until the 1981-82 season, and in successive seasons the numbers have been 36, 25 and 25. Last season only 15 seals were killed for food.

But conservationists and United States and New Zealand biologists have become increasingly critical of the practice of killing indigenous seals to feed introduced huskies. The birth-rate of the population in the McMurdo Sound area has declined significantly, and expert scientific opinion has been that even culling has become harmful. Also the terms of the Antarctic Treaty make it clear that New Zealand must stop taking seals if the local population is being affected.

There are other reasons for phasing out the huskies in addition to their replacement by faster and more efficient motorised toboggans. They have been retained for the recreational use of Scott Base staff but are rarely taken out on journeys — only one last season — and suffer from lack of exercise.

In addition many have become unhealthy because of inbreeding. Fresh blood has been introduced to counteract

this by bringing in huskies from British and Australian bases but the cost and difficulties have been excessive. A Christchurch veterinary surgeon, Mr David Marshall, has visited Scott Base for the last 12 years to check on the health and condition of the huskies, attend to injuries, and correct any dietary deficiencies. But since the 1970s cases of congenital rickets, heart failure, and hair loss have spread.

## TWO PUT DOWN

Mr Thomson says that the remaining Scott Base huskies will be allowed to live out their natural lives as far as possible. Most huskies born and bred in Antarctica live less than five or six years, and with age they suffer from osteo-arthritis and gastro-enteritis.

Scott Base began this year with 18 huskies. After Mr Marshall examined them two were put down — Helge, the oldest, who was eight years and four months old, and Abbe who was six years and two months, and was in bad health.

Now the oldest husky is Jens, born in July, 1978. On February 1 there were 13 huskies more than two years old, and three — Tania, Odin and Caspa, all born in February last year. The others are: Stareek (December, 1979); Julick, Rehua and Nimrod (all June, 1979); Tama and Manea (June, 1980); Anawa (March, 1918); Footrots (September, 1981); Bjorn (December, 1982); Monty, Herb and Kiri (January, 1984).

Britain, Australia and Argentina still maintain teams of huskies at certain bases but numbers have grown smaller in the last 10 years. The British Antarctic Survey has three teams (27) for recreation and training and four or five pups at Rothera Station on Adelaide Island. An official return for the 1984-85 season shows that 122 seals (40 Weddells and 82 Crabeaters) were killed to feed them.

In 1975 BAS had to close the Stonington Island station in Marguerite Bay as an economy measure. About 100 huskies were shot or put down painlessly. Their use had become costly and time-consuming

because they had to be fed on expensive whale meat, and it could take up to two years to train people to drive them. About 40, mostly pups, were transferred to Rothera as a standby in the event of any breakdowns of motor toboggans, other vehicles, and aircraft.

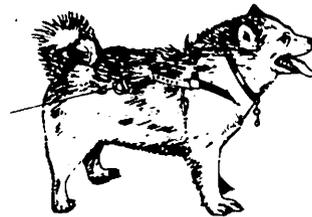
## OTHER COUNTRIES

Australia's three Antarctic bases, Mawson, Casey and Davis, all used huskies from the time they were established, Davis stopped in 1965 and Casey in 1970. Mawson still had 22 huskies and several pups in the 1975-76 season, using them for spring and winter journeys over the sea ice to count seal colonies. Now the base is reported to have one team of nine.

Exchanges of information under the Antarctic Treaty and annual reports to the Scientific Committee on Antarctic Research give numbers of seals killed each season for food and scientific purposes. Huskies are not always listed under transport at the bases.

Australian Antarctic Division annual reports give the numbers of Weddell seals killed for food at Mawson. These are low and have not exceeded 20 since the 1978-79 season. Ten were killed then, and the numbers in successive seasons have been 19, 11, 18, 6 and 20. Parts of the 20 killed in the 1983-84 season were for scientific use.

Argentina is reported to have about 18 to 20 huskies at Esperanza, its station on the Trinity Peninsula of Graham Land, and the same number at General San Martin, the base on the Palmer Land Coast in the Marguerite Bay area. But there are no up-to-date official returns of husky numbers or seals killed for food.



## ANARE

## Logistical problems interrupt big science programme

With a 1985/86 budget of A\$33.98 million (9.8 percent more than the previous year) Australia's most ambitious Antarctic programme since 1979 was to include a two month marine science cruise, the 2,300km traverse of the polar ice cap, a multidisciplinary study of the Bunger Hills, an expedition to Heard Island and a survey of Commonwealth Bay as a preliminary step to the possible establishment of a new base.

In spite of the early and lengthy besetment of the Nella Dan in the ice of Amundsen Bay and late season trouble with the drive shaft of Icebird which created severe logistical problems temporarily threatening winter resupply and the return of summer expeditioners to Australia, most of the major field programmes were completed.

(The story of the Nella Dan's besetment in the ice of Amundsen Bay, rescue and late return to Hobart appears on page 25 of this issue. The marine science programme was amended as a result.)

Leaving Melbourne on October 20 MV Icebird, on the second voyage of the programme, completed a rapid trip to Casey with seventy nine passengers — 26 winterers, 29 summer personnel and 24 on the round trip — fuel for Bunger Hill activities scheduled for later in the season and construction materials.

Encountering the first pack ice on October 27, 550 km north of Casey, her Bell 206B helicopters were used to locate leads through the year old ice. Temperatures as low as -14C at night with rapid freezing intermittently restricted progress. Conditions had eased by October 30 and the first flights were made to the station that day. Better conditions near the coast enabled Icebird to reach the fast ice one km from the station at 5 a.m. on October 31.

Work began immediately and with ice operations proceeding well priority cargo was ashore by noon and the unloading of construction materials completed during the afternoon. At 9 p.m. that night Icebird left Casey to establish an emergency fuel depot in support of Bunger Hill operations.

Unable to reach Merrit Island to lay the depot as planned Icebird left the fuel to the east at Snyder rocks and returned to Casey on November 1 to collect personnel for Hobart. With a blizzard forecast to reach the area shortly she left quickly and hove to in open waters for 24 hours while Casey was battered with 60 knot winds which broke up the pack through which Icebird was subsequently able to pass easily.

In spite of further storms Icebird arrived at Hobart on the morning of Sunday November 10, three days ahead of schedule.

Icebird's task on the second voyage was to deliver the 1986 winter and summer party expeditioners to Mawson where she was to remain to support science programmes and other activities. With the Nella Dan in trouble Icebird was diverted to collect the two parties earlier left on Heard Island by the trapped trip and subsequently to assist. Unable to help, she took on board 20 passengers from the Nella Dan and resumed resupply operations completing the Mawson changeover between December 7 and 12.

### Heard Island expedition

Eight seal counters in two parties based at Atlas Cove and Spit Point from October 1

to November 25 conducted a census of elephant seals. It was the first whole island census and will be used as a benchmark for future population estimates. The entire coast was photographed as part of the census and verification sought by ground counts or from helicopters where inaccessible. It was part of an international programme to monitor the population of the seals. Scientists also took blood samples to compare them with those taken from seals on Macquarie Island and carried out ultrasound assessments of seal blubber. Other programmes included a variety of geophysical observations, the deployment of magnetometers on the island and general biological observations of penguins, other birds and fur seals.

## Commonwealth Bay

On her third voyage Icebird collected the Project Blizzard team from Commonwealth Bay and continued operations at Casey and Davis but unable to reach Mawson because of ice conditions returned to Davis and back to Hobart where she transferred cargo to Nella Dan which was subsequently able to reach Mawson. While in Commonwealth Bay, Antarctic Division personnel briefly surveyed the area as part of an assessment for a possible scientific base. No decision has, as yet, been reached.

## New base in Bunger Hills

On 4 January Nella Dan began the 2,000 nautical mile journey to south west of Bunger Hills with 22 scientists and support staff to establish a new Australian summer station from which the first major shorebased field programme since the 1970's was to run.

Bunger Hills is a 950 square kilometre ice free area half way between Casey and the Soviet Station Mirny. One of the largest such areas in the Australian Antarctic territory it was first sighted in 1912 by Frank Wild, a member of Mawson's Australasian Antarctic expedition. From 1956 to 58 the Soviet Union maintained a scientific station known as Oasis in the area which they handed over to the Poles in 1959. It was

then renamed A.B. Dobrowolski, after a famous Polish scientist and has been used infrequently since then.

The location chosen from eight potential sites indentified during a short reconnaissance the previous summer is on the coast of Queen Mary Land, about half way between the Soviet station Mirny and Casey. It is on the western side of Bunger Hills in a sheltered bay close to a small freshwater lake and about 8 km west of Dobrowski.

It has been named after the Australian geologist Sir Tannatt William Edgeworth David, Dean of Science at Sydney University at the turn of the century. In 1907 he joined Shackleton's expedition to Antarctica where in March 1908 he led a party of five up Mt Erebus and the following October was leader of the first party to reach the south magnetic pole.

Edgeworth David, from which programmes are expected to run for three years, comprises five prefabricated igloo shaped fibreglass shelters known as apple or melon huts. They are designed to withstand winds of over 200 km an hour, are transportable by helicopter and able to be erected by two people in less than an hour. The first shelter was flown in on 18 January and four the following day. The sixth, a darkroom, was accidentally dropped on the Edisto Glacier when a helicopter safety catch malfunctioned.

The scientific programme was focussed on geology, biology, glaciology and meteorology in addition to obtaining comprehensive photographic coverage of the area.

As part of Gondwanaland studies, a team from the Bureau of Mineralogical resources collected about 3 tons of rocks from which they hope to compare the petrology and mineralogy of the region with other areas on the Antarctic coast and coast of Western Australia.

University of Melbourne scientists studied the structural orogenesis of the southern part of the Bunger Hills while others looked at the geomorphological evolution of the area as well as the Obruchev Hills and surrounding Nunataks. From glacial striae they will be able to ascertain direc-

flow over most of the area before it became deglaciated five to six thousand years ago. Sea levels were studied and shells collected for dating to indicate the time and rate of uplift. Other marginal and sub-glacial features of interest were also found.

Moss samples were collected from 63 locations as part of investigation into the presence of microfauna, bacteria and fungi. Freshwater and marine flatworms from the lake and sea edge were studied and the cocoons collected will be compared with worms found in the subantarctic Macquarie, Iles Crozet and Kerguelen. Large numbers of copepods were also collected in the algae mats found down to 5-6 metres deep in the lakes. Water samples collected will be sent to Japan for chemical analysis. Accurate survey points were established as a basis for a future programme to study the flow of the Denham Glacier.

Twenty adult Wedell seals and one pup observed in the area may be a distinct population trapped by 35 km of shelf ice from the open sea; Emperor and Adelie penguins were observed on the coast.

## Relief ship in trouble

On 17 February, 1200 nm south of Hobart fully loaded with fuel and cargo for the last voyage to collect the Bunger Hills party and complete resupply of the stations, Icebird's main drive gear between the engine and the propeller shaft cracked. With an ocean going tug on standby she returned to Hobart at half speed of 6.7 knots arriving on February 26.

Two specialist engineers with a 3 ton replacement gear from Germany arrived on 3 March. Assisted by Australian engineers they worked around the clock to have Icebird back at sea by 13 March.

In the meantime the ice was extending further out to sea than normal particularly near Australia's new Edgeworth David base and likely to start advancing by mid-March at all stations. Depending on weather conditions it can advance possibly as rapidly as 20 nm a day to a depth of 30 cm.

Ninety-one summer expeditioners remained in the four bases on the continent and extra fuel and food was required at Mawson and Davis to enable the stations to run through the winter without rationing.

Antarctic Division's ice researchers, based in Melbourne, worked with Antarctic meteorological experts to provide daily reports and predictions on the sea ice situation. Information was received by satellite pictures from Australia's Antarctic stations and the US Navy's joint ice centre at Maryland in USA.

The Nella Dan, having completed her resupply was 700 nm north of Casey en route to Denmark via Albany in Western Australia when she was recalled and the remaining season's work was divided between the two ships.

Nella Dan left Hobart on 24 February for Edgeworth David. Heavy pack ice covering

## *Pole still at sea*

*On January 16, 1909 Edgeworth David, Mawson, and Forbes Mackay reached the South Magnetic Pole and fixed its position (72.4deg S/155.3deg E) in Victoria Land. This year on January 5 a team of Australian scientists aboard the supply ship Icebird estimated its position at 2.20 p.m. as 65deg 13min S/139deg 53min E. about 86.33 nautical miles out to sea north of the French Dumont d'Urville Station.*

*A geophysicist, Mr Rodney Hutchinson, from the Bureau of Mineral Resources in Canberra, used an English-made fluxgate magnetometer suspended over the stern of the ship. The team, which included scientists from the Antarctic Division, Department of Science, used the magnetometer and specially-designed equipment on the ship's bridge during a week of vectoring experiments to fix the SMP position.*

9/10 of the sea prevented her from approaching closer than 50 nm and three helicopters transferred the 22 scientists and support staff to the ship in moderate wind and sea conditions at minus 10 deg. C. In spite of poor weather conditions they had completed a 50 day research programme which would provide new information on the geology of the Bunger Hills area.

By 17 March Nella Dan was in open water 300 nm north of Mawson travelling at 11 knots to reach Albany on 26 March with the expeditioners from Edgeworth David, Davis and Mawson to which she had delivered 520,000 litres of fuel, allowing the station to run at full consumption during the winter.

The Nella Dan's additional trip to the ice was not without incident. She was operating close to the ice window when freezing of the sea prevents access. During

the operation to collect the 25 expeditioners from Davis she had to shelter behind icebergs during a force nine gale, and to negotiate two belts of pack ice. At one stage she was blocked by hundreds of icebergs and dense pack but able to thread her way through the ice in spite of very poor visibility in heavy snow falls.

In the meantime the sea approaches to Casey remained relatively free of ice but it was not until 15 April that Icebird returned to Hobart with 28 summer expeditioners from the station. She too had carried additional fuel supplies for Mawson on the final voyage of the season during which she also picked up the last of the summer expeditioners from Davis and Macquarie Island.

Ninety-seven men and women are wintering over at Australia's three Antarctic stations, Casey, Davis and Mawson and the sub-Antarctic Macquarie Island.

## Work on French airstrip suspended

Australia exercised its right under the Antarctic Treaty to inspect another country's Antarctic station for only the second time in 22 years last summer. An official team of three, including a representative of the Department of Foreign Affairs, visited the French Dumont d'Urville Station early in January to inspect installations and equipment, and the controversial airstrip project in the Pointe Ceologie Archipelago.

French plans to build an all-weather 1100m airstrip by linking five small islands, Cuvier, Lion, Pellux, Zeus and Buffon, were strongly criticised by international environmental organisations in 1982. They claimed that extensive excavations and the use of heavy machinery and explosives, would interfere with several species of Antarctic seabirds and Adelie penguins which breed in the area.

Preliminary studies of Ile du Gouverneur, 3km from Dumont D'Urville, and the other islands, were made in the 1981-82 season. The next summer a civil engineering and construction team of 10 men began preliminary work on the largest

island, Lion, and was supported by an engineer and three technicians who installed equipment at Dumont d'Urville and on Lion. Small-scale earthworks were carried out in the 1983-84 season and direct work on the site was suspended in the 1984-85 season. Since then two environmental impact studies of the problems associated with the project have been made by French scientists. The Australian inspection team confirmed after its visit that no direct work was now being done on the airstrip, and was told officially that no funds for work in the 1986-87 season had been allocated by the French Government.

Australia's inspection team visited Dumont d'Urville at short notice when the chartered support ship Icebird called on January 3. No treaty violations were detected and the team was told that work on the airstrip site had been suspended although preliminary earthworks were under way. These are for engineering research and experiments in breakwater design, both of which need to be done before the project can go ahead.

A member of the inspection team, Dr Patrick Quilty, assistant director (science) Antarctic Division, said after the visit that he was satisfied that no direct work was under way. Only eight workers with limited machinery and equipment were engaged on the preliminary earthworks. Far greater resources would be needed to build an airstrip on the site and several years' work would be needed if the project went ahead. So far three metres of rock have been removed from the top of one of the

five islands and used to build a causeway to another island.

Adelie penguins breed on several of the small islands the airstrip would span, and at least eight types of seabirds breed in the immediate area. But Dr Quilty said that French biologists at the station seem well aware of the environmental problems associated with the airstrip project and have devised research programmes to study the problems.

## South Korea plans base in South Shetlands

A suitable site for a permanent base in Antarctica was found by scientists of a South Korean expedition which worked on King George Island, South Shetlands, last season. The expedition, organised by the Federation of Korean Maritime Boy Scouts, was divided into two parties.

Seven mountaineers led by Ho Uk attempted the ascent of Antarctica's highest peak, the 4897m Vinson Massif in the Sentinel Range of the Ellsworth Mountains. Nine men, including the expedition director, Yoon Sok-Sun, described as a former lawmaker, carried out a biological, geological, and meteorological programme on King George Island.

Both parties left Seoul by air on November 6 and returned on December 16. They travelled by way of Los Angeles, Miami and Santiago, and arrived in Punta Arenas, Chile, on November 13. The climbing party left Punta Arenas Chilean Air Force base at 1 p.m. on November 16 aboard a chartered Antarctic Airways ski-equipped Twin Otter aircraft piloted by Captain Giles Kershaw, which refuelled at the British Antarctic Survey base Rothera on Adelaide Island and landed at the base of the Ellsworth Mountains at 6 a.m. the next day.

A base camp was set up 2650m above sea level at 78deg 30min S/86 W, and the climbers' equipment and supplies were airdropped by a Chilean Air Force Hercules. They spent two days at the camp checking gear and preparing to establish advance camps. The first was set up at 3000m, the second at 3500m, and the third at 4100m. On their way to the high camp the climbers had to contend with

steeply sloping snow drifts, ice walls and crevasses.

When the party finally reached Camp 3 the temperature dropped to minus 35deg Celsius and visibility was only 5m. The climbers were pinned down in their tent for three days waiting for the weather to clear. By November 28 the slopes of the Vinson Massif were still hidden by blizzards and clouds.

With only enough food for three days the summit team, Ho Uk (leader), Lee Chang-Yong and Ho Chong-Shik, decided to wait no longer. Seven and a half hours after starting the final assault the three men were almost completely exhausted. They did not know at that stage that they were only 50m from the summit. Their altimeter indicated 5500m, a reading higher than the actual summit, and when they prised off the top of a vacuum flask with an ice axe the water inside was frozen.

## No Visibility

A decision was made to head back down the mountain to Camp 3 but a sudden blizzard reduced visibility to nil. The climbers roped themselves together and cautiously began searching for a safe route by which to descend. After five minutes they sighted a ridge leading to the summit. They reached the top at 12.30 a.m. on November 29. The temperature was minus 40deg. and the three men had time only to hoist the South Korean flag, bury an emblem of Hodori, the tiger mascot of the 1988 Seoul Olympics, and radio Camp 3 with their news before starting back.

Yoon Sok-Sun's scientific research team was flown from Punta Arenas to Teniente Rodolfo Marsh, by a Chilean Air Force aircraft, arriving on the afternoon of November 16. After surveying the terrain the team set up six tents as a temporary research centre and base, and raised their national flag in front of them.

On November 17, under the leadership of the team captain Hong Suk-Ha, all members began their respective assignments. Dr Chang Sun-Kun, of the Korean Oceanographic Institute, was engaged in geological studies; Lee Don-Huan did some underwater photography and collected samples of marine life, and Dr Choe Hyo, of the Korean Ocean Research and Development Institute, worked at the Chilean meteorological centre, Presidente Frei, on the analysis of meteorological data received from a space satellite orbiting over Antarctica.

## Bad Weather

As South Korea has indicated for several years that it may accede to the Antarctic Treaty, one goal of the expedition was to study all the research stations established on King George Island and introduce the South Koreans to their scientists and support staff. In recent years South Korea has concentrated on krill and fisheries research, having sent four expeditions to the Southern Ocean aboard chartered

commercial fishing vessels. Last season Yoon Sok-Sun's main task was to make diplomatic calls on all the other bases to pave the way for an exchange of research data and future joint projects.

Blizzards, strong winds, and temperatures around minus 15 C greatly hampered the research team's activities. The unpredictable weather often confined the scientists to their tents for many hours at a time.

Despite these handicaps and the limitation of their stay in Antarctica to only 25 days, the scientists achieved most of their objectives. They returned to Seoul with more than 100 geological samples, including 30 fossils as well as more than 50 samples of marine life, and obtained valuable meteorological data by way of the space satellite.

Logistic support for the mountaineering party was provided by a United States-Canadian company, Adventure Network International (ANI) set up to operate research vessels, field camps, and services to Antarctic expeditions. Captain Kershaw, who provided air support for the British Transglobe and Footsteps of Scott Expeditions, is responsible for ANI's air transport and resupply logistics. His company, Antarctic Airways, based in Calgary, operates a specially-equipped Twin Otter. The South Korean party was one of three climbing parties put into the field between November 8 and December 17.



## BAS news

## Sixth season for Offshore Biological Programme

In spite of poor travelling conditions, storm damage to aircraft and the entrapment in pressure ice of the RRS John Biscoe, the British Antarctic Survey reports good progress with most field programmes. These included geology, geophysics and glaciology on James Ross Island (part of a cretaceous back-arc basin), investigation of the ice dynamics of the Ronne Ice Shelf and Rutford Ice Stream, and the continuation for the sixth season of the long-term Offshore Biological Programme (OBP).

RRS John Biscoe, which had been trapped in pressure ice near a reef off Adelaide Island for a week in mid-November but appeared to be undamaged, was escorted to Palmer station by the West German ship *Polarstern*. There, the John Biscoe's passengers and the rest of the crew (a total of 40 men who had been accommodated by the Americans) were re-embarked, and the ship proceeded the short distance to Damoy summer station on Wiencke Island.

The Damoy hut and airstrip were found to be in good condition but bad weather delayed cargo-handling, so a brief visit was made to Faraday station before putting men and stores ashore at Damoy for transport by air to Rothera. The ship then rounded the northern tip of the Antarctic Peninsula to take cargo to James Ross Island field workers, encountering heavy pack ice in Prince Gustav Channel. A call at Signy, South Orkney Islands, where RRS Bransfield had also arrived, then enabled BAS divers to carry out a thorough inspection of the hull. No damage was found.

### OBP begins

After brief visits to Montevideo and the Falkland Islands, the ship arrived at South Georgia on December 23, and a few days later commenced three months' work on the long-term Offshore Biological Programme under the command of the ship's

co-Master Malcolm Phelps. This is the sixth season's work. The area to be covered this year extends up to 70 nautical miles from the precipitous islands at the northwestern tip of South Georgia, and much was achieved in January and February in spite of appalling weather (prolonged gales and some fog). The programme includes physical oceanography with measurements of horizontal and vertical flux of water and nutrients and investigation of microbial activity, both over the shelf and deep ocean. Bird (predator) censuses are also being carried out in transects extending from Bird Island and the Willis Islands, and fish and krill sampled. Most transects completed so far have shown good agreement between predators (fur seals, macaroni penguins and other seabirds) and krill distribution.

At the end of January, a visit was made to the Falkland Islands to pick up spares for a defective bow thruster and to allow scientists and crew a brief respite ashore.

RRS Bransfield arrived at Grytviken, South Georgia on December 8 having sailed south via Montevideo and the Falkland Islands. The BAS buildings were inspected and on the following day the ship took biologists to Maiviken and relieved the Bird Island station in a rare spell of excellent weather. (More cargo was delivered to Bird Island by HMS *Endurance* later in the month.) Cargo was taken to Signy station.

South Orkney Islands, and the ship then set course for Halley.

### Air pressure measurements

After some delay because of strong winds and bad visibility the ship arrived off the Brunt Ice Shelf on December 22, but had to wait for the wind to abate before commencing relief operations. As usual, possible landing sites had been reconnoitred prior to the ship's arrival, and routes to the station marked by lines of fuel drums. Once started, unloading was completed very quickly and the ship then placed a weather buoy in drifting ice at lat. 75deg.53'S, 32deg.46'W. The buoy is one of several being deployed by West German, American and British researchers for a Winter Weddell Sea Project studying atmosphere/ice/ocean interactions. Measurements of surface air pressure supplied by the buoys will be especially valuable as they are not obtainable from satellites.

The ship then visited the West German Neumayer station, 480 km to the northeast, and delivered some fuel to the Polarstern. Bransfield returned to Halley on January 3 but because of bad weather, men leaving the station could not board the ship until the 6th when she then sailed. There are twenty winterers at Halley.

The passage north was uneventful and the ship arrived at South Georgia four days later and proceeded to Signy, as rough seas once more prevented cargo-handling at Bird Island. She arrived back at South Georgia on January 16, completed the Bird Island relief, moved the biologists from Maiviken to Husvik and departed for Montevideo to collect more summer visitors and cargo. The ship then headed south via the Falkland Islands to the west coast of the Antarctic Peninsula, to deliver cargo to Rothera station and support geologists in a series of landings extending south to Marguerite Bay. Faraday was visited *en route*.

The three Twin Otter aircraft, which had arrived at Rothera on October 7 had begun the season, as usual, by flying supplies to Fossil Bluff station, George VI Sound, and

opening it for the summer. They were then out of action for a while with damage caused by gales at the Rothera airstrip and were then grounded by bad weather. However, some ice reconnaissance was undertaken for the John Biscoe which was trying to reach Rothera early, and more fuel was taken to Fossil Bluff. Later, sixteen field workers and equipment from the John Biscoe were ferried south from Palmer and a further sixteen from Damoy, and onward flights to their work sites began on November 23.

### Earth science projects

In December, groups of earth scientists were established in several areas of Alexander Island, in George VI Sound, on the Oscar II Coast and Dolleman Island (Black Coast), depots were set up and a number of geological landings made on the Antarctic Peninsula spine. Access to the large fuel depot established last year at Spatz Island, south of Alexander Island, was restricted by bad weather. Although buried by nearly 3m of snow the depot was located in December and dispersed to various centres of field work (both for this season and 1986-87), including the Eklund Islands, Rutford Ice Stream, Ronne Ice Shelf, Mt. Smart (Sweeney Mountains), Mt. Schwartz (southwest of Spatz Island) and Sky-Hi Nunatak (74deg.51'S, 70deg.48'W).

All field parties were kept supplied by air; men, equipment and specimens were transported as necessary. Fossil Bluff was used as a staging post for most flights south of Rothera. It was manned throughout the summer, and used by the aircraft sometimes several times a day. A group of eleven Chileans arrived at the station intending to build a refuge there, but decided that the site was unsuitable because extensive summer melt limits use of the airstrip.

In early January one aircraft was grounded at Fossil Bluff for a week with a defective nose oleo, but a replacement taken south by the Bransfield was flown from Halley and quickly fitted.

As well as supporting field workers, one aircraft carried out air photography of the

Kenyon Peninsula (which juts out into the Larsen Ice Shelf in about lat. 68.5deg.S), the Eternity Range (Palmer Land), parts of Alexander Island and James Ross Island. A second concentrated on reconnaissance aeromagnetic and radio echo sounding flights over Ellsworth Land and southernmost Palmer Land. This work is a continuation of a joint BAS-USARP project investigating the structure of West Antarctica and its relationship to East Antarctica. It was to have been extended to Marie Byrd Land, but this was postponed because of a shortage of fuel at Siple station.

### Mt. Jackson climbed

In January, surveyors working on the Dyer Plateau, Palmer Land, took advantage of good weather to climb Mt. Jackson (3,178m) — the highest mountain of the Antarctic Peninsula. The first recorded ascent was by a BAS party, led by one of the foremost British climbers, John Cunningham, in 1964, and there have been several others since then.

All field parties were due to be airlifted back to Rothera at the beginning of March and the aircraft were to return to Britain.

### Other field work

Several groups of geologists and geophysicists have spent several months working on the sedimentary and volcanic rocks of James Ross Island. Although lack of snow and sea ice had made travel difficult, they have had a very successful summer. The geologists were assisted by HMS Endurance's helicopters at the end of January on James Ross Island, nearby Vega Island and the adjacent mainland. Some hydrographic survey was done in Prince Gustav Channel. The geophysicists carried out gravity, total-field magnetic, ice-thickness and depth-to-bedrock measurements over the island, but the lack of sea ice prevented traverses over the Channel.

Twenty-one Argentine geologists arrived on James Ross Island by helicopter in mid-January, to work at three localities for a month.

Smaller BAS groups studied basement rocks on the east coast of the Antarctic Peninsula in about lat. 66deg.S (Oscar II Coast), the youngest Alexander Island volcanics, the deformation history of an accretionary prism in northern Alexander Island, and the Fossil Bluff Formation of eastern Alexander Island. Other geologists visited a number of localities in Marguerite Bay. Long-term investigations into the mineralisation of the Antarctic Peninsula area have begun with reconnaissance work in the South Shetland Islands, Anvers Island and Horseshoe Island.

### Ice dynamics

Glaciologists working on ice dynamics have been following a flow line from the Rutford Ice Stream to the Ronne Ice Shelf front — a distance of 800km. Aluminium stakes have been planted every 25km and their positions measured with a Doppler satellite surveyor to an accuracy of a few metres. These will be remeasured in a year's time to obtain accurate velocity figures. The project is part of an investigation into how ice shelves control the stability of the West Antarctic ice sheet.

An investigation into the movement of ice streams over their beds has been continued, by monitoring more than a hundred stakes on the Rutford Ice Stream. Optical levelling will provide surface profiles which will be compared with features seen on Landsat satellite imagery. Radio echo sounding of ice thickness and monitoring of tidal movement at the grounding line by means of sensitive tiltmeters have also been undertaken.

Other glaciologists have spent the summer drilling on Dolleman Island. In spite of persistent bad weather, typical of the east coast of the Antarctic Peninsula, they collected a 133m core spanning 250 years' snowfall. This, together with a French/Argentinian 200-year core from James Ross Island and a series of American drillings at Siple, should provide a comprehensive picture of the recent climate of the Antarctic Peninsula. The climatic

parameters can be compared to the post-1940 records from Antarctic Peninsula meteorological stations and to the 80-year records from Orcadas, South Orkney Islands. Extrapolation of the climate back 250 years will thus be based on good contemporary data.

## Excellent core

The BAS team used a light-weight Japanese drill designed for operation to 200m. The drill worked well and produced a complete core of excellent quality. The chief difficulty in the operation was the weather: too warm for drilling by day and too overcast to allow regular flights to transport ice core and personnel between the work site and Rothera. Field analysis of the core was restricted to stratigraphy and density measurements, together with an innovative non-destructive profiling of the core measuring the dielectric frequency response from 20Hz—300kHz. The response appeared to vary significantly along the core with a roughly seasonal period. Other geophysical investigations were carried out in the area to support the electrical studies and to provide data if deeper drilling to the bedrock of Dolleman Island is undertaken later. Clean samples were also collected for pollution research.

In addition to the Offshore Biological Programme, biologists have continued a wide range of projects on Signy Island, bird and seal studies on Bird Island and botany as far south as Marguerite Bay. Freshwater biologists who have been working on the Signy lakes for a number of years have also carried out a preliminary investigation of lakes at Maiviken, Cumberland Bay, South Georgia, thus extending their research into the sub-Antarctic. The Maiviken party was also able to visit the Barff Peninsula on the Endurance, and later spent a month at Husvik. Endurance undertook sampling and photography of lakes on Candlemas Island, South Sandwich Islands.

Routine observations have continued at the two geophysical observatories, Halley and Faraday. At Halley VLF/ULF magnetospheric observations have been

initiated to investigate wave-particle interactions and charged particle precipitation, and meteorologists are developing boundary layer research. The station also participated in the International Halley (comet) Watch from mid-March to May, undertaking photography and photometric studies monitoring development of the comet's tail.

Two more mobile huts were added to Halley: one to provide office accommodation for Advanced Ionospheric Sounder projects and the other to house the new VLF/ULF experiment. A weather satellite receiver and display unit was installed at the station. The 1983 buildings are now permanently buried, and general maintenance work has included extension of the access shafts to keep pace with the accumulating snow.

Three automatic weather stations have been set up on the Larsen Ice Shelf and one at Fossil Bluff for the University of Wisconsin, as well as a weather buoy in the Weddell Sea for the international Winter Weddell Sea Project.

## Other ships and aircraft

- An American party on board Polar Duke carried out an official inspection of the BAS Faraday station in November.
- The tourist ship World Discoverer has visited Faraday twice and Signy once and the Society Explorer has visited Faraday four times. At least two hundred tourists have been ashore at Faraday.
- A Borek Twin Otter aircraft, carrying eight Canadian and American climbers and flown by ex-BAS pilot Giles Kershaw, landed at Rothera in November *en route* to and from the Vinson Massif. A later flight in December carried a group of Korean climbers.
- Several Chilean Twin Otters called at Rothera and Fossil Bluff in December, and two West German Dorniers flew to Neumayer from Marsh via Rothera, Fossil Bluff and Halley. The West Germans were the first summer visitors at Halley. The Dorniers revisited Halley three times in

January, and one was trapped there by bad weather for four days.

- Two helicopters from the Soviet ship *Kapitan Gotskiy* called at Halley in late December.
- A number of senior BAS scientists and other headquarters staff have worked in

the Antarctic during the summer, joining the ships in Montevideo or the Falkland Islands. Four women participated in the John Biscoe's Offshore Biological Programme and a fifth was one of the geologists undertaking landings in the Antarctic Peninsula area.

## United States

# Thirteen women winter at three U.S. stations

United States bases in Antarctica will have a winter population of 163 men and women this year. Four stations are occupied by winter teams; Siple Station, closed last winter, was re-opened for the 1985-86 season. There are 150 men and 13 women at the four stations; in 1985 there were 110 men and six women in the three teams.

Of 17 members of the winter team at the Amundsen-Scott South Pole Station 1327km south of Ross Island five are scientists and 12 are support staff. There are six women, the highest number to winter since a 27-year-old doctor, Michele Eileen Raney was the first of her sex to remain at the Pole in 1979. Two of the women are scientists, and four — a senior cook, a communications co-ordinator, a meteorologist and a meteorological technician — work for the National Science Foundation's support contractors, ITT Antarctic Services.

Siple Station, deep in Ellsworth Land, has a winter team of seven. Two are scientists, four work for ITT Antarctic Services, and one is a United States Navy medical corpsman.

Ross Island has a winter population of 147 this year. There are 132 men and women at McMurdo Station. Five, including one woman, are scientists, and 32 men and two women work for ITT Antarctic Services. The United States Navy is represented by 90 men and three women.

In addition to 132 Americans there are 11 New Zealanders at Scott Base and a Canadian-born glaciologist, Greg Crocker, from the University of Cambridge. Jack Hayward Base, established by the Footsteps of Scott Expedition in February last year for the summer journey to the South Pole by three men, is occupied this winter by three men. They are Gareth Wood, who reached the Pole with Robert Swan and Roger Mear on January 13, and Steve Brodie and Terry Lovejoy, members of the crew of the support ship *Southern Quest*.

Palmer Station on Anvers Island off the Antarctic Peninsula is expected to have a winter team of seven when summer operations end on April 24. Two are scientists, four men and one woman work for ITT Antarctic Services, and one man is a US Navy medical corpsman.



## Amphibian and reptile fossils in Antarctic valley

United States geologists have discovered the 225-million-year-old fossil bones of four new species of amphibians and reptiles in Antarctica, a finding that may change scientists' views on how long these animals existed on that continent.

The fossils were found in the Gordon Valley near Mount Falla, a 1158m peak in the Queen Alexandra Mountain range. The location is near the site where a bed of fossil bones of amphibians and reptiles was discovered in 1969 by Ohio State University scientists.

A team headed by Dr William R Hammer of Augustana College in Illinois reported finding a cache of more than 350 vertebrate fossils, including a triangular skull .6m long and a jaw with 25.4mm-long teeth of two amphibians. At least one of the fossil bones is thought to be of an extinct family of amphibians called *Capitosauridae*, never before found in Antarctica.

Dr Hammer told the US National Science Foundation's Division of Polar Programmes, which made grants for the research to Augustana College and Wayne University in Detroit, that the discovery is especially significant because about 50 of the fossils were found at a rock level in the Triassic period about 304.8m higher than that at which bones associated with that geologic time had been found previously. The Triassic period, between 225 and 190 million years ago, was marked by a great expansion of reptiles.

Because species discovered in higher levels of strata are younger, Dr Hammer said his find may give scientists new clues about how long these animals existed in Antarctica and may tell more about the continent's environment during the Triassic period.

## U.S. helicopter wrecked

*A United States Navy helicopter was wrecked beyond repair on January 18 when it made a hard landing at 11.48 a.m. (Antarctic time) on Flat Top (3962m) in the Commonwealth Range. Two scientists flown from a major geological camp near the head of the Beardmore Glacier to collect rock samples, and the helicopter's crew of five, suffered only minor injuries.*

*Flat Top, which is the highest point in the Commonwealth Range, is an ice-covered peak with a broad flat summit. It lies just east of the head of the Osicki*

*Glacier which flows west into the Beardmore, and was named by Scott's 1910-13 expedition.*

*Two of the three helicopters supporting the Beardmore programme flew the scientists and crew back to the camp. Later they returned to McMurdo Station aboard a ski-equipped Hercules aircraft.*



## Heavy pack ice traps polar ships

Ship operations in Antarctica last season were seriously affected by the heaviest concentration of pack ice around the continent for at least 20 years. Southern Quest sank while attempting to reach Cape Evans in support of the Footsteps of Scott Expedition, and two, the British Antarctic Survey's Royal Research Ship John Biscoe and the Australian National Antarctic Research Expedition's chartered resupply ship Nella Dan, had to call for help from ice-breaking ships of other nations.

Major changes in the Australian Research programme had to be made as a result of the besetment of the Danish ice-strengthened Nella Dan, which was trapped for 52 days on her first voyage of the season. Some of the marine research projects planned could not be completed, a survey of fish resources around sub-Antarctic Heard Island was not possible, plans for a survey of the Tottan Glacier near Casey Station were deferred, and HMAS Stalwart, the 10,965-tonne destroyer tender and flagship of the Royal Australian Navy, had to be chartered at a cost of \$A270,000 to resupply sub-Antarctic Macquarie Station.

When the Nella Dan sailed from Hobart on September 16 on a two-month's marine research cruise to Heard Island and the continental ice edge off the coast of Enderby Land, the pack ice was at its winter maximum, extending more than 500 nautical miles north from the coast of Antarctica. The voyage was the earliest an Antarctic Division chartered ship had ever ventured into the icebound Southern Ocean.

Fifty-one scientists and technicians, including three New Zealanders, Jeni Bassett and Paul Ensor, of Christchurch, and Dr Lynn Williams, of Sydney, were aboard Nella Dan. The three main objectives of the expedition, led by Dr Knowles Kerry, were to study the breeding habits of the

Crabeater seal and the winter habitat of krill, survey bottom living fish in the 200nm exclusive economic zone around Heard Island, and conduct a census of the island's elephant seal population.

Between October 1 and 14 Nella Dan placed field parties on Heard Island at Atlas Cove and Spit Point. On October 8 she entered the pack ice to begin seal research. At first she worked in the pack north of Mawson Station but as few seals were found she searched further to the south and west.

### PROBLEMS BEGIN

Nella Dan's problems began when she was north of Amundsen Bay off Cape Ann in the Enderby Land region 520nm west of Mawson Station. She was making easy progress when the ice closed in under the influence of wind and currents. This happened on October 23 and by October 28 no further progress was possible.

Some attempts were made to free the ship. The anchor was dropped on the ice to break it up, and crew and passengers attempted to break the ice from around the hull, using crow bars and pick axes. Eventually a small pool of water was created around the hull and Nella Dan was able to make slow progress towards open water. But at best she could do little more than 100 metres a day, and was using valuable fuel reserves in the process.

After reviewing the weather and the condition of the ice near Nella Dan the Antarctic Division decided to divert the West German chartered polar ship Icebird from her resupply voyages to Mawson and Davis Stations so she could pick up the 14 scientists on Heard Island. She sailed from Hobart on November 12, picked up the field parties on November 25 and then headed for Amundsen Bay to assist Nella Dan.

Although she is a more powerful ship than the 25-year-old Nella Dan, Icebird could not get any closer to the trapped ship than 9nm. Briefly she too was squeezed in the pack ice and was unable to move for several hours. Finally on December 3 the decision was made to transfer 20 of Nella Dan's passengers to Icebird, using the helicopters carried by both ships, and the attempt to break out the Danish ship was abandoned.

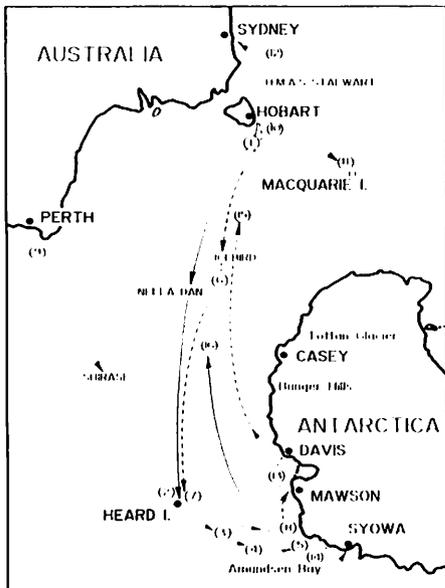
Icebird resumed her voyage to Mawson and Davis, completing the changeover between December 7 and 12. The Nella Dan

passengers remained aboard and returned to Hobart on December 23, 99 days after they had left there.

Before Icebird left Nella Dan the Minister of Science (Mr Barry Jones) announced that the Japanese Government had agreed (at no charge) to send the research ship and icebreaker Shirase to make a second attempt to rescue the imprisoned ship. The Shirase, which can break ice 1.5m thick at a speed of three knots, was in Fremantle loading for her relief voyage to Syowa Station which is about 400nm west of Nella Dan's position.

A few extra items of cargo were loaded on Shirase before she sailed on December 3. They included fresh fruit and vegetables, spare parts for one of the helicopters, special items for Christmas, and 60 tonnes of marine diesel fuel which was needed so Nella Dan could return to Hobart at full speed if freed from the pack ice.

Shirase was in Amundsen Bay 10 days later. She broke the ice around Nella Dan



#### MAP SHOWING LOCATION OF PRINCIPAL EVENTS CONCERNING THE NELLA DAN'S BESETMENT

1. 16 September: *Nella Dan* sails from Hobart.
2. 1-4 October: *Nella Dan* deploys field parties on Heard Island.
3. 8 October: *Nella Dan* enters the pack ice to commence seal research.
4. 13 October: *Nella Dan* continues the search for Crabeater seals by heading further south.
5. 28 October: *Nella Dan* encounters heavy ice and is finally beset.
6. 12 November: *Icebird* sails from Hobart and is diverted to Heard Island.
7. 25 November: Heard Island parties picked up by *Icebird*, which then diverts to assist *Nella Dan*.
8. 3 December: 20 passengers from *Nella Dan* transferred to *Icebird* after it was decided to abandon the attempt to free *Nella Dan*.
9. 3 December: *Shirase* sails from Fremantle to assist *Nella Dan*.
10. 4 December: *HMAS Stalwart* sails from Hobart.
11. 8 December: Resupply of Macquarie Island completed by helicopter from *HMAS Stalwart*.
12. 12 December: *HMAS Stalwart* arrives in Sydney.
13. 7-12 December: *Icebird* completes changeover of Mawson and Davis stations.
14. 14 December: *Shirase* frees *Nella Dan* from pack ice after being trapped for over 7 weeks.
15. 23 December: *Icebird* arrives in Hobart with 20 passengers from *Nella Dan*.
16. 29 December: *Nella Dan* returns to Hobart after 104 days.

Reproduced with permission from *Anare News*, December 1985.

which had gripped her for 52 days, taking nine hours to force her way through the last 2nm of 4m-thick ice barring the way out. On December 14 Nella Dan was once again able to make her own way.

Until both ships were in open water, Shirase escorted Nella Dan through the pack ice. The two ships travelled in convoy as the ice continually moved in behind Shirase blocking Nella Dan's progress. Shirase took Nella Dan in tow when breaking through the worst of the pack, and the fresh food, helicopter spare parts and fuel were transferred once relatively open water was reached.

### COOK'S DEATH

After 104 days in the Southern Ocean, Nella Dan returned to Hobart on December 29. On board were her Danish crew of 31, 16 of the original 36 Australian and New Zealand scientists and technicians and the body of a ship's cook, 21-year-old Kim Retlef Nielsen. He died on October 20 in international waters from head injuries sustained in a fall during rough weather north of Mawson before Nella Dan was trapped.

Nella Dan's return nearly six weeks behind schedule meant that the Antarctic Division had to rearrange its shipping plans for the remainder of the season. Nella Dan was to have returned on November 20 for the Heard Island cruise and left again on November 25 to carry out the changeover of winter and summer teams at Macquarie Island Station. Negotiations with the Royal Australian Navy resulted in the charter of HMAS Stalwart to do the job. She was diverted while returning from exercises in South-East Asia and sailed from Hobart on December 4.

### HMAS STALWART

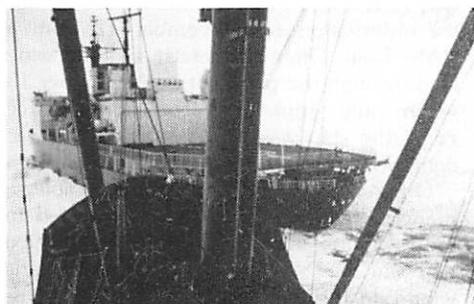
With this winter's team of 14 scientists, weather observers, and support staff, and supplies and fuel the Stalwart arrived at Macquarie on December 6. Cold fronts with winds gusting to 50 knots and rough seas forced curtailment of the operation at one stage. The Stalwart's four helicopter pilots were forced to fly in winds of 50 to 60 knots when transferring supplies from ship



**The Nella Dan trapped in the ice in Amundsen Bay. Photo: Paul Ensor.**



**Expeditioners attempt to free Nella Dan. Photo Paul Ensor.**



**The Nella Dan follows the Shirase out of the ice after 48 days. Photo: Paul Ensor.**

to shore, but the mission was completed on December 8, and the ship returned to Sydney on December 12.

Because of the changes in the ANARE programme, the field party which established the new summer research station Edgeworth David in the Bunger Hills area of Queen Mary Land in mid-January, remained there for an extra two weeks. But Icebird, which was assigned originally to pick up 22 scientists and support staff, cracked her main drive gear in February and had to turn back to Australia.

Nella Dan was recalled from Hobart to collect the party early in March. Heavy pack ice prevented her from approaching closer than 50nm to the station, and the summer team was flown out by three helicopters two days ahead of schedule. Nella Dan ended her eventful season when she returned to Hobart in the second week of March.

### SHIP ABANDONED

Almost a month after Nella Dan was first caught in the ice, a BAS polar ship was in trouble. The RRS John Biscoe was caught in 10/10ths pack ice off the westcoast of the Antarctic Peninsula and had to be abandoned on November 18. She drifted in the pack dangerously close to grounded icebergs and was heading to rapidly shoaling waters some 2nm from the Amiot Islands off the south-west corner of Adelaide Island when the decision to abandon ship was taken.

With 31 crew and 133 BAS scientists and support staff, John Biscoe under the command of Captain Chris Elliot, was on her way to Rothera Station on Adelaide Island. Ice observation on November 12 from a BAS Twin Otter indicated a good wide lead through the pack but on November 13 when only 4nm from the northern ice edge, the ship was held fast as the ice was tightened by northerly winds.

On November 14 the vessel was able to manoeuvre in the pack and attempted to return to the northern edge. But the next day she was held fast again by northerly winds. In the evening Captain Elliot advised BAS headquarters in Cambridge that the vessel was drifting towards some

icebergs about 3nm away.

As a result of this call the United States National Science Foundation's chartered research vessel Polar Duke immediately went to the assistance of John Biscoe. She arrived on the night of November 17. A severe northerly gale compacted the ice again and finally the ship was abandoned soon after 9.30 p.m. GMT.

### PACK BROKEN

Sixty-four passengers and crew were transferred to Polar Duke which turned northwards to rendezvous with the West German research ship and icebreaker Polarstern in Bismarck Strait. Twenty officers and crew and four BAS staff were transferred to Polarstern which had also responded to the call for assistance, and Polar Duke took the remaining 40 to the United States Palmer Station on Anvers Island, arriving on November 20.

With her much greater power Polarstern broke through the pack, came close to John Biscoe on the morning of November 20, and was able to transfer 24 crew and BAS staff in a steel basket by crane. The trapped ship had sustained no damage and her engines were running within 30 minutes and she was able to move out of the ice under her own steam, escorted by Polarstern.

On November 21 John Biscoe arrived at Palmer Station, anchoring in Arthur Harbour. Arrangements had been made earlier for 16 of the 40 BAS staff to be airlifted to Rothera Station by a BAS Twin Otter which used the Palmer skiway. The transfer of the remaining 24 back to the ship was completed on November 21 and she departed on November 22.

Conditions in the Ross Sea were reported to be the worst in 20 years with fast ice twice as thick as in a normal summer. Only one of three expeditions, two of them private, which encountered the worst of the ice from mid-December to late January attained its objective. This was the first official Italian expedition which chartered the Norwegian ship Polar Queen, a vessel specially built for work in Arctic and Antarctic ice with an experienced crew. The Polar

Queen sailed from Lyttelton for Terra Nova Bay on December 11 and reached the area on December 22 although it had to push its way through ice two metres thick.

Southern Quest, the support ship for the Footsteps of Scott Expedition, and Greenpeace, flagship of the international environmental organisation, both headed for Ross Island in December. Greenpeace, a converted tug, sailed before Southern Quest but had extreme difficulty in finding a route through the pack.

Under the command of Captain Graham Phippen the converted Icelandic trawler Southern Quest sailed from Hobart on December 28. She was unable to reach Cape Hallett to land six Austrian mountaineers who had joined the 18 men and women on the expedition, but pushed her way through 200 nautical miles of loose pack and reached open water north of Beaufort Island in the first week of January. The first objective of the expedition was to assemble a Cessna 185 aircraft which was to be used to fly Robert Swan, Roger Mear and Gareth Wood back from the South Pole to the expedition's Jack Hayward Base at Cape Evans after the completion of their journey from Ross Island.

### FIRST FLIGHT

As the way into McMurdo Sound was blocked the ship could not reach its base and launch the aircraft from stable sea ice at Cape Evans. So for nearly three days a team worked nonstop to assemble the aircraft on an ice floe 17nm from Ross Island. A short runway was hacked out through the pressure ridges and the Cessna 185 made a trial flight. But after it landed the runway split and another strip had to be prepared.

During these three days the ice closed in on the Southern Quest. On the morning of January 11 she tried to break through 100m of heavy pack to reach open water. But in the afternoon she was gripped tight between two heavy floes. She was then about 4nm from Beaufort Island at 76deg 56.8min S/67deg 13min E.

Although everyone worked for eight hours with picks and shovels in a vain attempt to free the ship the ice pressure was

increasing. Finally late at night the pack split the hull near the engine room. Water poured into the engine room holds and the ship began to list. Captain Phippen advised Scott Base and the Amundsen-Scott Pole Station of the situation at 11.37 p.m. and reported that the ship had been abandoned and the crew and passengers were on an ice floe.

Twenty-one men and women, including the six Austrians, had only half an hour to escape to the relative safety of the ice floe. But they were able to take emergency equipment and clothing with them, and then mark out a landing strip, set up tents, inflate life rafts, deploy flares and beacons, and erect a radio aerial.

### U.S. AID

In response to the distress call helicopters from the United States Coast Guard icebreaker Polar Star flew everyone off the ice floe to Beaufort Island and then to Cape Bird on Ross Island. From there 18 men and three women were ferried by United States Navy helicopters to McMurdo Station. The rescue operation took four hours and was completed in the early hours of January 12.

As the crew set up its base on the ice a message came through that Swan, Mear and Wood had reached the Pole shortly before midnight. Only 11 minutes after receipt of the message the ship went down stern first in 80m of water.

Three members of the expedition were at its Cape Evans base when the ship sank. They were Captain John Tolson (radio operator/film cameraman), Dr Michael Stroud (medical officer) and his fiancée, Thea de Moel, one of four women on the ship who had been dropped off by Captain Giles Kershaw, pilot of the Cassna 185. He and his engineer, Rick Mason, had flown on to Williams Field 11km from McMurdo Station on the Ross Ice Shelf in readiness to pick up the Pole walkers.

By January 14 all 23 members of the expedition and the six Austrians were together at McMurdo Station, Swan, Mear and Wood having been brought back from the Pole in a Hercules aircraft by the United

States Navy. Except for three men, Wood, Steve Brodie and Tim Lovejoy, everyone was flown to Christchurch later in the week at a cost to the expedition of \$NZ30,000, the charge made by the US National Science Foundation.

## WINTER TEAM

Wood and the two crew members, Brodie and Lovejoy, are at Jack Hayward Base this winter. They will prepare base buildings, stores and equipment, and the Cessna 185 for the summer when the expedition plans to send a ship to pick them up.

Greenpeace, which sailed from Melbourne on December 20 under the command of Captain Peter Bouquet, had early warning of what lay ahead before the ship could reach Ross Island where the 34 members of the expedition planned to set up a permanent base at which four men were to winter. The first ice was sighted at 52deg S and the first pack when the ship was 377nm from Ross Island.

By January 2 the ship was reported off Scott Island (67deg 24min S/179deg 55min W) and 310nm north-east of Cape Adare. Five days later she had made better progress but was still 8.5nm outside the northern edge of the pack seeking a lead. On January 11 the ship was almost caught in dense ice and had to change course and retreat north again.

By January 13 Greenpeace was back on course and heading west towards Beaufort Island. But the next day she encountered ice up to 2.5m thick and was forced to turn north again, still 97nm from Ross Island.

Captain Bouquet and Peter Wilkinson, leader of the expedition, decided on January 15 to stay between 27 and 34nm north of Beaufort Island and 59nm east of Cape Bird. They hoped that the ice barring the way into McMurdo Sound would break up and enable the ship to reach Cape Evans. By January 20 there was little change and time was running out for the establishment of the base before United States ships and aircraft left the area.

## HELICOPTER FLIGHTS

There was some possibility that if the ship remained another week materials, equipment and other supplies could be unloaded at Cape Evans to give the expedition a head start when Greenpeace returns to Antarctica this summer. While the ship remained 21.5nm north and 9.9nm west of Ross Island the expedition's Hughes 300 helicopter did ice reconnaissance flights in McMurdo Sound and around Ross Island, using a video camera.

Between January 21 and 24 Captain David Walley, accompanied by a West German biologist, Ralph John who was to have been one of the four men to winter on Ross Island, made flights to Cape Bird and Cape Evans to survey the terrain, access etc and areas for scientific research. On January 24 the two flew to Scott Base from Cape Evans after discussions with the Footsteps of Scott winter team. They arrived at 5.50 p.m. and remained for two hours and a half to pick up mail at the post office, buy stamps, and hand over a considerable quantity of expedition mail for dispatch overseas.

After the helicopter returned Greenpeace headed west towards the Bay of Whales. On January 30 all 34 members of the expedition were on the ice together for the first time since their six-week voyage began. They raised the Greenpeace flag near an Adelie penguin rookery, proclaimed Antarctica a world park — one of the purposes of the mission — and read a declaration signed by 134 environmental groups from all over the world.

Reports that the ice in McMurdo Sound and at Cape Evans was breaking up caused the expedition to head back to the area. But when the ship reached the ice edge on February 2 the entrance was still blocked as the ice kept breaking up and reforming. After a reconnaissance flight on the morning of February 3 Captain Bouquet decided the time had come to head north again.

Greenpeace arrived in Wellington on February 12. A few days later she returned to Auckland where she has been laid up for the winter.

## Bondarenko breaks rudder

The *Kapitan Bondarenko*, sister ship of the *Mikhail Somov*, stranded in the ice for 133 days from March to July 1985, broke her rudder in heavy ice conditions at 4 am on 1 March while unloading supplies 140 km (73 deg. 25 min S, 139 deg. 12 min) from Ruskaya Station.

Three hundred tons of oil, spare parts and foodstuffs were transferred to the *Somov* which was lying alongside at the time. From there it was carried by the *Somov's* two MI-8 helicopters in approximately 100 three ton loads to Ruskaya.

Lightened by the reduction in cargo, ballast was pumped from the stern to the bow of the *Bondarenko* raising the level of the rudder revealing the blade broken from the stock with part of the casting missing. A team of 3 divers and the ship's engineers worked three shifts 24 hours a day for six days to make temporary repairs, enabling the ship to proceed to Wellington. Assisted by the Professor Zubov, a research vessel

working in the area, she arrived in Wellington on 20 March where repairs were to be made in the dry dock, but her troubles did not end there. Her arrival coincided with a local dispute involving the harbour masters and she finally entered the dock on 12 June. With repairs complete she departed from Wellington on 29 June.

The *Bondarenko* is an ice-strengthened cargo ship, of 7,684 tons which is normally based in Vladivostock. She was built at Amure, north of her home port in 1966 and was on contract to the Arctic and Antarctic Research Institute in Leningrad from the Far Eastern Shipping Company.

Captained by Stepan Kharchenko, her master assistant was A. Kovalenko, master of the *Moskva*, the icebreaker which in December 1984 was diverted from leading ships into Provideniya Bay to assist with the successful rescue of 2,000 white whales which had been trapped in the ice in the shallow Senyavin Strait in the Bering Sea.

## Australian yachtsmen in Ross Sea

*Five Australian yachtsmen who sailed a steel-hulled yawl into the Ross Sea early this year ended their Antarctic cruise when they returned to Sydney by way of Hobart on March 21. The yacht, named Riquita, went as far south as Cape Hallett (72deg 19min S/170deg 16min E).*

*Leader of the expedition was Barry Lewis, 37-year-old son of Dr David Lewis, who sailed his 9.7m sloop Ice Bird single-handed from Australia to Antarctica in the 1972-73 and 1973-74 summers. With him were Ian Smith (owner), Phil Kelly, Steve Deck and Peter Gill.*

*Loaded with food for a year, sledges, skis, crampons, ice axes and polar clothing, the Riquita left Sydney on January 10. The expedition planned to sail as far south as*

*Ross Island and establish a record high latitude for a yacht in southern waters.*

*Ice reports before the yacht sailed were most discouraging but the "self-propelled tourists" as Barry Lewis called them were able to reach Cape Adare late in January and had fine weather for the stage to Cape Hallett in the second week of February. They also made an unsuccessful attempt to visit the Balleny Islands where David Lewis took an expedition in the 1977-78 season aboard the 17.4m ocean racing sloop Solo.*

*When he was 20 nautical miles south-east of Cape Adare Barry Lewis called Scott Base to advise that he was bound for Cape Hallett. Riquita arrived there on February 13. Three of the crew went ashore and met members of a New Zealand field party*

which had been working there since January on the reclamation of the old United States-New Zealand station closed since 1973. The next day the New Zealanders were picked up by a helicopter from the United States Coast Guard

icebreaker *Polar Star* and returned to Scott Base.

(Barry Lewis has agreed to write his own story of yachting in the Ross Sea for the winter issue of "Antarctic".)

## Three ascents of Vinson Massif

Antarctica's highest peak, the Vinson Massif (4897m) in the Sentinel Range of the Ellsworth Mountains was climbed three times last summer by parties from the United States, Canada and South Korea. Support for the expedition, which was based in Punta Arenas, was provided by the Chilean Air Force which had an official observer with the parties and air dropped fuel and food for up to three months from a Hercules aircraft to a base camp at 78deg 30min S/86deg W in the Ellsworths.

Since 1966 when an American Alpine Club expedition made the first ascent with United States Navy support the Vinson Massif has been climbed five times. It was climbed in 1980 by two West German scientists and a Soviet exchange scientist with a United States research expedition in the Ellsworth Mountains, and again in 1983 by the Seven Summits Expedition which was supported by the Chilean Air Force and included Americans, Japanese and one Englishman. It used a modified Tri-turbo DC-3 with three engines instead of two which was flown by Captain Giles Kershaw.

In 1984 a United States expedition had to abandon an attempted ascent because of what were described by the leader as "fantastic political complications", 140-knot winds on the Antarctic Peninsula and mechanical failure in one of the aircraft's engines.

The leader was Peter Bruchhausen, who once worked on the Ross Ice Shelf Project, and with him were two Canadians, Pat Morrow and Martyn Williams, and another American, Michael Charmer Dunn. They also chartered the Tri-turbo DC-3 flown by Captain Kershaw and received Chilean Air Force support.

Early this year a special 11-day North Pole adventure flight was organised to raise funds for a second attempt on the Vinson Massif by the expedition. In April a travel group paid US\$9400 each to fly across the Canadian Arctic from Edmonton to the Pole and back. One-third or more of each fare went to the 1985 expedition fund, and Sir Edmund Hillary, his son Peter, Neil Armstrong, first man to walk on the moon, and Pat Morrow accompanied the group to assist the project.

Last season's expedition was organised by Peter Bruchhausen, and carried out by Adventure Network International (ANI) which plans to open up Antarctica to teams of private explorers and mountaineers, and now operates research vessels, base camps, and expedition services. It was formed by Dunn, Morrow and Williams in conjunction with Kershaw, who is responsible for the air transport and resupply logistics.

Antarctic Airways has been formed to provide air support for ANI projects. It uses a ski-equipped de Havilland Canada Twin Otter which carried eight passengers only because it is fitted with an internal 250-gallon ferry tank which gives it an endurance of 12½ hours at 135 knots.

Flown by Captain Kershaw and his engineer Rick Mason, the Twin Otter, which was fitted with skis in Santiago, left Punta Arenas on November 8 with the first party of eight Canadian climbers for the Vinson Massif by way of the Chilean Teniente Marsh Station on King George Island and the British Antarctic Survey station, Rothera, on Adelaide Island. The party set up the base camp and then waited for the supply drop by the Chilean Air Force Hercules.

One of the Canadians had to withdraw from the final stage of the ascent of the Massif. Captain Kershaw, who ferried supplies from the base to advanced camps, took his place and reached the summit while Rick Mason remained with the aircraft.

Another Canadian, Pat Morrow, who was the second man to reach the summit of Mt Everest with the Canadian expedition in 1982, achieved two ambitions last summer. He climbed Antarctica's highest peak, and by doing so joined the select company of climbers who have reached the summits of the world's seven highest peaks.

## KOREAN SEVEN

Seven South Koreans were the next to reach the top of the Vinson Massif. They were members of the mountaineering section of a research expedition organised by the Federation of Korea Maritime Boy Scouts. The climbers followed the same route to the Ellsworths from Punta Arenas and made their ascent on November 29. The leader, 34-year-old Hur Uk-bu, hoisted the national flag at the summit and buried there a badge representing the 1988 Olympic Games to be held at Seoul.

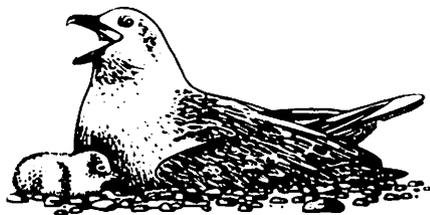
Early in December the Twin Otter flew to the Ellsworths again with the United States party. The eight climbers were Philip Trimble, Daniel Emmett, Frank Morgan, Daniel Bass, Glenn Porzak, Gerald Roach, Yvon N Chouinard and Douglas Thompkins. Two are reported to have climbed the Vinson Massif and two made an ascent of the second highest peak, Mt Tyree. Four of the climbers, Trimble, Emmett, Morgan and

Porzak, are members of The Explorers Club of New York as is Peter Bruchausen

ANI's Antarctic operations ended on December 17 when Captain Kershaw brought the United States party back to Punta Arenas. But his did not. He continued on to Calgary by way of Miami to prepare for another Antarctic operation.

By Christmas Day Kershaw and Mason were in Hobart to provide air support for the Footsteps of Scott Expedition. They joined the support ship Southern Quest on December 28 for the voyage to McMurdo Sound where their mission was to fly the expedition's chartered Cessna 185 to the South Pole from Cape Evans and bring back Robert Swan, Roger Mear and Gareth Wood after they had retraced Scott's 1911-12 journey. They were able to fly the Cessna to Cape Evans before the ship was sunk but came back to New Zealand with the rest of the expedition on January 15 in a United States Hercules aircraft.

References: "Antarctic" March 1967. Page 470; June 1980. Page 63; March 1984. Page 183; March-June 1985. Page 372.



## Project Blizzard completes second season

Project Blizzard, the private Australian expedition, which last year began assessment of the condition of the hut built at Cape Denison for Mawson's 1911-14 Australasian expedition, completed a second but modified part of the programme this season. Expedition members this year included Mawson's grandson. They carried out limited maintenance and collected further information on which future conservation programmes are likely to be based.

For this stage of the work they were assisted by a government grant of \$20,000. It was the first private expedition since BANZARE (British, Australian and New Zealand Antarctic Expedition of 1929-31) to receive supplementary government funding. Australia's Antarctic Division also agreed to return part of the expedition to Hobart on board their chartered resupply vessel M.V. Icebird.

Conceived as a two part programme the objectives of the first stage in 1984/85 were to obtain information on which to base recommendations to the government for future maintenance of the site and in the second stage to implement them. This was subsequently modified when the Australian Heritage Commission stipulated that the maintenance programme was premature and more information was required before anything other than a limited amount of work could be carried out.

The team for this season's activities was divided into a conservation and support party. William Blunt, a Sydney architect, mountaineer and co-leader of the project led the conservation party which comprised Greg Crispo, surveyor; Dr Earl Dorney, medical officer; Michael Gatehouse, base camp manager and Stephen Bunton who provided technical support. Angela McGowan, archeologist from Hobart and Janet Hughes, a material conservator from the Power House Museum in Sydney were short term participants whose inclusion in the party was stipulated by the Heritage Commission when the project was unable to find suitably qualified volunteers. Sup-

ported by a government grant of \$20,000, they provided professional assessment of the site and the problems associated with preserving the artifactual material.

Assisting the conservation party was a support group led by project co-leader Dr Ross Vining, and comprising Linda Vining, the project's associate membership secretary; Richard Meares who co-ordinated scientific support and followed up the previous years zoological fieldwork; and David Powdrell, equipment officer who assisted Ron Gaha and Ted Butler in providing logistical support.

A special member of the expedition was Alun Thomas of Adelaide, grandson of Sir Douglas Mawson who provided an historic link and assisted the conservation party during his brief stay at Commonwealth Bay.

For the 1500 nm journey south the Southern Quest was chartered for three weeks from the "Footsteps of Scott Expedition", the support party returning on the same vessel. Under the terms of the charter the expedition members assisted with sailing the vessel with the owners providing the necessary professionals. The Conservation party remained at Commonwealth Bay to implement the programme, returning on Antarctic Division's chartered resupply vessel, M.V. Icebird. The ship was in Commonwealth Bay to support a survey of the area of Antarctic Division officers as a prelude to the possible establishment of the first Australian research station in the region since Mawson erected his four huts there in 1912.



*Mawson's hut lies in the centre of an historical valley containing artefacts from the Australian Antarctic Expedition of 1911-14. Photo: Project Blizzard Library.*

The Southern Quest sailed from Hobart on 30 November. For the first six days of the southward voyage conditions were good but late on 6 December just north of Commonwealth Bay the expedition encountered solid pack ice only hours after sighting the first bergs and brash ice. For three days she moved east and west probing the ice in search of the shore lead regularly occurring in the vicinity of the Bay. Eventually she found a wide lead near latitude 149 E two days before she was due to start her return journey to Hobart. On December 10 the Bay was in sight and she moved into anchor.

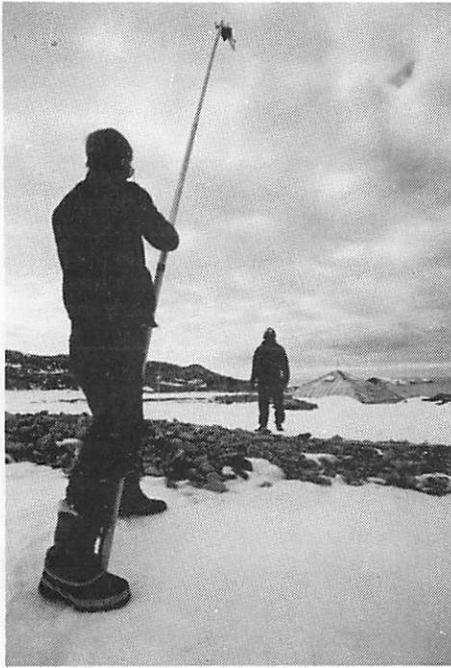
Expeditioners unloaded in the teeth of a 40 knot gale. First ashore was the conservation team which began work immediately. By late that afternoon the last of the cargo

was unloaded and some of the support crew returned to take the Southern Quest 100 km west to Du Monte d'Urville to fulfill philatelic obligations. This, in addition to individual contributions of \$3,500 from each of the new members and sponsorship of \$45,000 from two independent organisations, provided the basic funding for the expedition. Once back at Cape Denison the team were involved in penguin swabbing and site documentation before returning to Melbourne on the Southern Quest. The seven members of the conservation party remained to complete their programme.

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*Cover: Project Blizzard: Archaeologist Angela McGowan and assistants Steve Bunton and Michael Gatehouse excavating pits in snow and ice to allow the insertion of emergency props beneath the platform. Two are already in place. Photo: Project Blizzard Library.*

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*Photographing artefacts adjacent to the main hut. The whole area was photographed by this method to provide a detailed mosaic record of the site. Photo: Project Blizzard Library.*

The team were accommodated in "Apple Shelter", a dome shaped fibreglass hut provided by Antarctic Division and also used a small insulated hut built by an Australian expedition in 1978. Projects undertaken included archaeological work in and around the main hut, scientific observations and a detailed survey of the Cape.

Within the main hut considerable snow clearing was required and permission granted by radio from the Heritage Commission to replace joists cracked or split because of the additional weight on the storage platform (floor of the loft) caused by snow accumulation. Four holes, each taking three days, were excavated for the new

timbers. Artefacts found were carefully collected, photographed and their position mapped before they were packed in plastic bags with an identification number of either reburied in ice or placed aside for safe storage.

A detailed topographical survey of the site involved the setting up of sixteen control stations, taking of horizontal and vertical angular measurements together with the distances of over 2000 points of interest. High points, low points, change of slope, artefacts, rock and snow boundaries were all measured and the data plotted to produce a 2 metre interval contour map of Cape Denison. This was a continuation of work begun in 1984/85 when efforts were confined to the valley containing the historic buildings and most of the artefacts. A brief excursion was made to the Mackellar Islets in search of Australian Antarctic Expedition material but none was found.

The Conservation party was picked up by Icebird on January 5. This was approximately three weeks earlier than originally planned but in keeping with the ANARE schedule which was revised because of the besetment of the Nella Dan. While the equipment, food and personnel were being loaded into two amphibious army LARCS for transport to the Icebird, Antarctic Division personnel and official observers were shown over the site, and geophysicists, from the Bureau of Mineral Resources, took readings at the Absolute Magnetic Hut.

Although the departure of the Project Blizzard team from Commonwealth Bay signified the end of their direct involvement with the site, time will now be spent in completing reports and submissions to Antarctic Division which will assist in the preparation of a long term management plan.

(Just as Antarctic was going to press we were advised that a committee will be set up later this year to look at the Cape Denison site. Draft terms of reference include advice to the Minister of Science on the significance, future conservation of the

site and a programme for maintenance of its historic aspects. The committee will also prepare plans for the possible establishment of a scientific base at Cape Denison which

will include a work station for the conservation of the site. We hope to have further details in our next issue.)

## Sub-Antarctic

### Campbell Island team

Seven men and one woman are maintaining the meteorological and scientific programmes at New Zealand's Campbell Island this year under the leadership of Darryl Morrow of Timaru.

In charge of the meteorological programme is senior technician Robert Pool of Auckland who is being assisted by Sander Calenbrander of Dunedin, John-Paul Lilburne of New Plymouth and Scott Freeman of Auckland.

The programme comprises radiosonde radarwind flights involving the launching and tracking of a hydrogen balloon twice daily. It measures and transmits continuous temperature, relative humidity and pressure values to a ground receiver. The position of the balloon is tracked by radio theodolite which gives a record of the winds through the upper atmosphere. Synoptic weather reports providing a comprehensive picture of the surface conditions including cloud descriptions, wind, temperature and pressure change are passed by radio telephone to the weather office in Wellington, every three hours. Climatological recordings providing rainfall, hours of sunshine, radiation and soil temperatures are taken every 24 hours and since 1984 sea temperature is measured at the wharf as part of a programme in conjunction with the Auckland University's Marine Research Laboratory.

Technicians Alan Lorking of Motueka and Douglas Willems of Christchurch are maintaining a series of long term seismic, geomagnetic and ionospheric programmes.

Station manager for the year is Peter Hooper of Auckland and the cook is Judith Winter of South Canterbury.

The team arrived at Campbell Island on the Nelson based commercial fishing vessel the Daniel Solander on 18 October last year and have since been visited by HMNZS Southland in December and HMNZS Waikato in January.

Late summer visitors included the Norwegian Arctic ice-strengthened research vessel Polar Queen (1050 tonnes). It was under charter from G. C. Reiber and Co Ltd of Bergen to the Italians working in Terra Nova Bay last summer. Greenpeace also paid a brief visit on their return from the ice.

Six bags of mail were dropped to the team by an RNZAF Orion on 22 July, 1986 and the next contact with New Zealand is expected to be the arrival on the relief ship bringing in the replacement team in mid-October.

### General Grant found again?

New evidence suggesting that the wrecked American trading vessel the General Grant may lie up to 20 miles south of the traditionally accepted site prompted a privately organised expedition to the Auckland Islands last season in search of the wreck which has eluded others for 120 years. The expedition returned to New Zealand early in March having confirmed the wreck to be the Anjou which sank in 1905 (and about which little is known) and having located another wreck which they now believe more likely to be the General Grant and which they hope to dive on again in 1987/88.

The General Grant en route from Melbourne to London struck the west coast of the main island in the Aucklands group on the morning of 14 May in 1866. Ten

survivors of the complement of 58 passengers and 25 crew spent 18 months on the island before being picked up by the Amherst in November 1867 and brought to New Zealand. From their accounts it was assumed that the wreck, which is believed to contain some 2,000 ounces of gold, lies near the Beehive Rocks.

## Compass variation

Recent research however indicates that the estimated location was based on magnetic readings taken from the compass relative to the earth's magnetic north while the true readings would have been based on astral observations which according to the survivors had not been taken for two days because of the prevailing weather conditions. A chart, which would have been in use at the time, shows that the difference between the magnetic and true readings was some twenty degrees, putting the location of the wreck close to the area in which the expedition leader dived and found an unidentified wreck in 1976. It was on this wreck that the team planned to dive.

The survivors of the General Grant were lowly crew or passengers and all they would have seen for several days was the compass in front of the helm which provided a magnetic reading and on which they recalled having turned north or south. Because the Island is magnetic there is a 20 degree or 15 kilometre difference in the traditional and possible new sites of wrecks. A number of unidentified wrecks also lie off the coast of the Islands which were incorrectly charted until 1900.

Diving contractor and expedition leader Malcolm Blair led a team of seven divers, Bill Day, Trevor Davies and Willy Bullock all of Wellington and John Dealing, Peter Johnstone and Terry Brailsford of Auckland. The skipper was Derek Boys, the mate Jack Webber and the cook Dave Mercer all of Wellington. John Gibb and Chris Williams were the ship's engineers.

The team arrived at their first site approximately 1 nm north of Bristow Point on Friday 10 January in the Little Mermaid, a

150 ton, 76 foot long catamaran powered by two twin 140 hp turbo diesel engines and equipped with five winches — the largest with a 45 ton capacity, air bags, jet blowers and cargo nets, compressors and suction pipes. They removed approximately 100 tons of rock and rubble from the site before locating an engine plate cover bearing the name Nantes, where the Anjou was built.

Part of the expedition continued to work the Anjou while three members swam the coast first south and then north to where they located a new site of a wooden wreck. Subsequently jet blasting 250 tons of material off the wreck they dived to find a wooden structure with copper sheeting, and recovered a steel cannon, lead sounding weights, part of a bell without a name and 64 silver coins dated 1813-30.

Although the coins predate the wreck the area of probability based on the survivors' accounts and magnetic correction, the structure and the tonnage as deduced by the size of the anchors and chains points conclusively towards the wreck being that of the General Grant. According to an expedition spokesman, preliminary research into the coins in London indicates a plausible explanation.

There being no known claimants for the wreck of the General Grant members of the expedition, which cost an estimated \$200,000 could profit by several million dollars from their return trip even after the crown has claimed the statutory ten per cent.

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## Wartime refuge at the Auckland Islands

Since their discovery in 1806 by Abraham Bristow in the whaling vessel "Ocean", the Auckland Islands have been visited by ships of many different types, including sailing fleets of 19th century naval and exploring expeditions, government supply ships, modern naval frigates and hydrographic vessels, fishing boats and private yachts. Most visits were planned, but for the nine ships that foundered on the storm-bound rocky shores of these islands prior to 1901 the encounters were unintentional and often tragic.† However, none of these visits was as clandestine or controversial as that which took place between August and October 1939 at the outbreak of the Second World War.

At mid-day on 28 August 1939 the 9,000 ton German freighter "SS Erlangen" was quietly cast off from the wharf at Dunedin and slipped unobtrusively out of the harbour. An air of tension prevailed among the German officers and Chinese crew, whose hasty departure had been prompted by a telegram warning of the impending declaration of war. With insufficient provisions and only 220 tons of coal, which would enable only five day's steaming, the nearest neutral ports in South America seemed hopelessly out of reach. After careful study of the charts the ship's master Alfred Grams decided to seek refuge at the uninhabited Auckland Islands, lying some 200 nautical miles south of mainland New Zealand.

**Paul Dingwall is chief scientist with the Department of Lands & Survey in Wellington. His article is based on an account of the voyage of the "Erlangen" written by her master Captain Alfred Grams and obtained from Mr Fred Joseph of Ohope Beach who with Mr Paul McGahan, a Lands and Survey ranger, first drew Mr Dingwall's attention to the report and photographs.**

The towering cliffs of the islands are an awesome and imposing site for mariners, but for Grams they promised seclusion and a sanctuary in which to prepare for escape from enemy waters. Lacking charts of the islands, Grams cautiously manoeuvred the "Erlangen" through the heads of Carnley Harbour and steamed slowly up the channel, passing en-route, but leaving undisturbed, the castaway provisioning depot at Camp Cove, before anchoring at the very head of the North Arm, some nine nautical miles beyond open water. Seventy-five years earlier the small schooner "Grafton", skippered by Thomas Musgrave, was driven ashore from a nearby anchorage, its remains still littering the adjacent shores. But for Grams and the "Erlangen" it was to prove a secure and bountiful refuge.

The most urgent task was to reconnoitre the island for food and fuel, but this was delayed by the refusal of the Chinese crew to go ashore for fear of lions and tigers! They capitulated only when the officers agreed to carry firearms. Fresh water was plentiful and food abundant — especially the "wild geese" (undoubtedly Wandering Albatross, many tens of thousands of which breed on slopes surrounding Carnley Harbour), and the

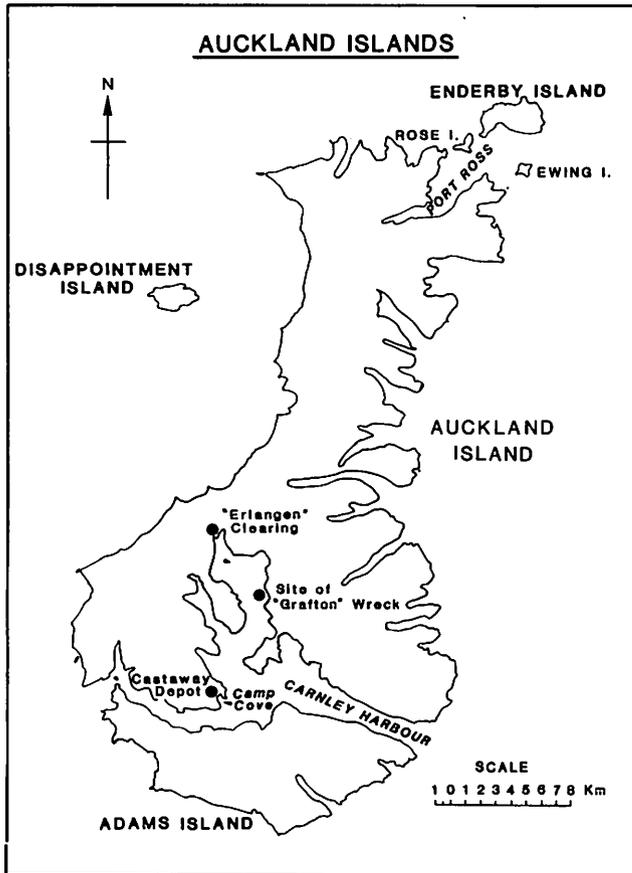
enormous quantity of mussels, a wonderful treat for the Chinese which became their staple diet and were dried for use on the long voyage ahead.

The task of fuelling the ship, however, was a formidable one. The rata trees (commonly known as "ironwood"), the only sizeable trees in the coastal forests there, were so hard that axes and saws made little impression on them. Once cut, the heavy timber was difficult to carry over marsh and the rocky shoreline to the lifeboats for transport to the ship.

Although pleased with the first day's haul of 3 tons of timber (estimated as

equivalent to one ton of coal), Grams was devastated by the prospect of accumulating the 400 tons of wood which he calculated was required to supplement the remaining coal for the almost 5,000nm voyage to South America. Given the limited stock of provisions, he realised that the rate of timber supply must be increased to 20 tons per day — an awesome task which would test the ingenuity and stamina of the fiercely determined mariners to the limit.

Tree-felling was made easier by the use of pit-saws which the chief engineer fashioned from spare guards for winch cog-wheels. A steam winch constructed to



*Under the constant threat of discovery and without charts the Erlangen was cautiously manoeuvred up the North Arm 9 nm beyond open water.*

haul timber aboard, though using three tons of precious fuel each day, was far more efficient than the block-and-tackle it replaced. But the biggest delay in fuelling the ship was the long haul by lifeboats.

Against all his natural instincts and professional seamanship, Grams realised that he must deliberately beach the ship. After careful soundings were made, the ship was gently run ashore and made fast by flooding all the ballast tanks. A low line was then fastened to the shore so that lifeboats could be towed quickly over the 120m distance between the ship and the shore. Working ten-hour daily shifts and employing all their resources, the exhausted but thoroughly drilled crew were

*With the "Erlangen" beached to reduce the distance from the shore, lifeboats, some of which were lashed together to form rafts, were used for loading timber in the ship.*



soon achieving their seemingly impossible daily quota of 20 to 23 tons of wood — a proud achievement.

The work was conducted under the constant threat of discovery. One day, the alarm was sounded when smoke was seen rising above the island, but it turned out to be an illusion created by jets of water thrown into the air from a waterfall by the strong and turbulent winds that are so common there. On another night, the sailors were alarmed by what appeared to be searchlights but, fooled again by a freak of nature — the Aurora australis was responsible.

In fact, the New Zealand authorities had begun a search of the southern islands. In late September the cruiser "HMS Leander" was despatched to Campbell and Auckland Islands. Although anchoring in Port Ross to the northern end of the main Auckland Island, and patrolling the eastern coastline, the ship was prevented from entering Carnley Harbour by bad weather and the "Erlangen" remained undetected. The "Leander" returned to search Carnley Harbour in November, but by then the "Erlangen" had made her escape.

On 5 October, with food becoming scarcer and harder to obtain, Grams realised that the target of 400 tons of wood could not be achieved, and the ship must be prepared for departure. Grams pinned his hopes on sail. With remarkable despatch the "Erlangen" was transformed into a sailing vessel; with sails made from hatch tarpaulins sewn together, and derricks suspended from a ten ton tackle serving as yards.

The biggest question in Grams' mind was, would his incredible gamble to beach the ship pay off? After several desperate attempts, the ship, which had been beached for three weeks and was now laden with 250 tons of wood, remained stuck fast. It was only by pumping out all the ballast water, thus risking capsizing, and

running the engines full astern, that refloating the ship was eventually successful.

As she steamed out of the harbour, rigged for sail, her yellow Lloyds funnel painted black, and her name changed to "Bengalen" of Rotterdam, the "Erlangen" was a very different vessel from the one which had arrived at the islands 38 days before.

It was not until discovery of the forest clearing in 1941 that evidence of the "Erlangen's" visit became known. Today, a two hectare patch of regenerating forest, covering cut rata stumps, is all that remains as a tangible reminder of a remarkable chapter in the history of human contact with this lonely island outpost of New Zealand.

*Postscript: Little is recorded of the voyage across the Pacific, and the eventual fate of the "Erlangen" is a matter of some debate. § However, it is known that, 35*

*days after leaving the Auckland Islands, using a combination of sail, coal and wood (some of which was supplied by consuming virtually everything burnable on board) the "Erlangen" made landfall at the port of Anoud in Southern Chile, from where she sailed into Puerto Montt on 12 November 1939. Grams' diary records that the voyage totalled 4,800 nautical miles of which 1,507 were made under sail.*

**References:**

† Dingwall, P. 1980 "Castaways of the Auckland Islands", *Landscape* 8: 12-17. Department of Lands and Survey.

§ Leahy, P.J. 1983 "The fate of the "Erlangen", *New Zealand Listener*, 3 December 1983, Page 57.

Musson, R.G. 1984 Letter to the Editor, *New Zealand Listener*, 4 February, 1984.

*Crewmen tackle the difficult task of felling the durable rata trees, to supply fuel for the "SS Erlangen" at anchor in Carnley Harbour.*



## 75 year old food cache found

French sardines, Danish pemmican, and English jams, biscuits and beef suet, all more than 75 years old, were found in the remains of a food depot at Butter Point by New Zealanders working from Scott Base last summer. The depot, which was located first by Garth Varcoe, the Antarctic Division's buildings and services officer, was laid during Scott's 1910-13 expedition for the Northern Party led by Lieutenant Victor Campbell.

Butter Point forms the north side of New Harbour which is on the western side of McMurdo Sound about 70km from Scott Base. It has been a staging point for field parties since Scott's 1901-04 expedition and was named by a party which ascended the Ferrar Glacier in 1903. Three tins of butter were cached there on October 14 as the party hoped to obtain fresh seal meat on the journey back to Hut Point.

Since then Butter Point has been used by parties from Scott's two expeditions, Shackleton's expedition, including the South Magnetic Pole party, and the New Zealand section of the Commonwealth Trans-Antarctic Expedition. On November 17, 1980, a New Zealand field party found tins of butter perfectly preserved in the snow and ice. They were put there in 1957 by Hillary's team. After chipping away 23 years' accumulation of ice the 1980 party found also wafer biscuits and dehydrated beetroot, canned peas, golden syrup, Christmas hams and 200 blocks of chocolate.

In October last year Mr Varcoe was making a tractor journey across the sea ice to Marble Point and Butter Point. Nearing Butter Point he sighted some boxes sticking up out of the snow. He talked about them to Alex Pyne, leader of a Victoria University of Wellington party working in the New Harbour area, and the first thought was that the boxes were part of the depot stocked in 1957.

When he returned to Scott Base late in November Mr Varcoe was able to examine the area at Butter Point more closely. He recovered a tin of Huntley and Palmer's biscuits which was brought back to Scott

Base. In mid-January he made a third visit to Butter Point and found far more of the remains of the depot exposed than in December.

### BURIED IN ICE

Over the years blizzards had scattered the contents of the depot. There were two heaps each spread over areas of four square metres. The boxes were all in reasonable condition but much of the material in them could not be recovered because they were deeply embedded in the ice.

But Mr Varcoe and four others from Scott Base — Max Williams, Kevin Jenkins (drillers), Ian Pottinger (welder) and Ian Lake (carpenter) — were able to recover a wide range of foodstuffs. They spent more than seven hours digging into the ice and making an inventory of the contents of the boxes. Appropriately, they found some butter but it was inedible after 75 years unlike the French sardines. Chocolate appeared to be eatable but the taste betrayed its age.

One box contained tins of Atco beef suet, and a tattered leaflet about its virtues enabled Mr Varcoe to determine that all the food was supplied to Scott's 1910-13 expedition. The leaflet contained recipes and one of the small scraps of paper in the bottom of the box carried a recipe for suet pudding.

Three rolls of bacon packed in wheat husks were found. They might have provided a rasher or two but the five men preferred to sample the sardines packed by the firm of Francis Martin in the Breton port of Douarnenez. They tried also sledging biscuits which crumbled on exposure to the

atmosphere, raspberry jam, and Fry's malted cocoa and Lipton's tea. The cocoa was drunk at Scott Base; Lipton's tea had been spoiled by the damp.

Some of the food found in the depot had been supplied to Scott's expedition by English firms which are still in business, although there have been name changes since 1910. Sugar cubes came from Henry Tate and Co., now Tate and Lyle, and the depot also contained Robinson's pearl barley (still running freely). There were three varieties of jam — plum, strawberry and raspberry — made by Beach and Sons, of Evesham.

Other foodstuffs in the list were: Egg powder, powdered milk, self-raising flour (Limmer's) and oatmeal. There were also metal boxes of Bell's wax matches, and two lots of candles branded Belmont Stearine. Both the normal thin type and the short thick ones produced a good flame when lit.

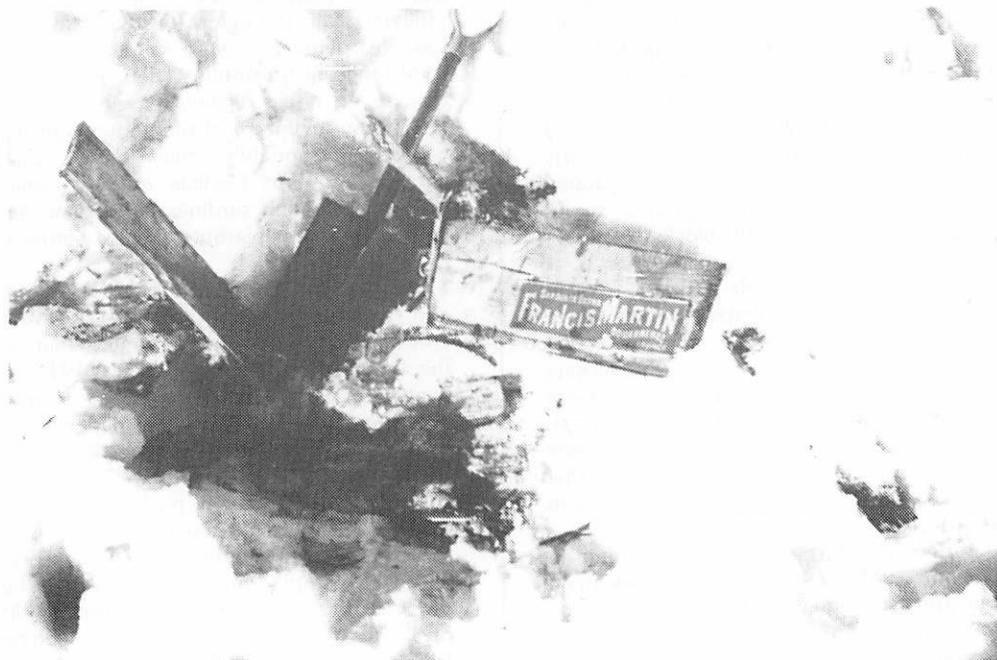
A bamboo pole blackened with age was found lying in the ice. This helped to determine when the depot was laid and who was responsible. Between September

and November, 1911, provisions were left at Butter Point by three field parties. The Northern Party led by Campbell was taken there by the Terra Nova and the six men laid out their depot for the return journey down the coast of Northern Victoria Land if the ship was unable to pick them up from Inexpressible Island in Terra Nova Bay. This was on January 27.

In September Scott led a party to the Ferrar Glacier and left oatmeal, cocoa, sugar, pemmican, and biscuits. The Western geological party led by Griffith Taylor found some of the boxes left by Scott when it reached Butter Point on November 17. It departed on November 18, leaving two week's provisions, as instructed by Scott, for its return journey. When the party reached Butter Point on February 12/13 it found that the depot had been blown over

**A box of French sardines found in the remains of the Depot. After 75 years the sardines were still edible.**

**Photo: Garth Varcoe**



and wrecked. The four men took some pemmican, butter and chocolate from the depot but left the rest.

#### NORTHERN PARTY

Campbell's Northern Party was put ashore at Cape Adare, Robertson Bay, by the Terra Nova on her first voyage back to New Zealand. The six men were picked up from their winter quarters in the first week of January, 1912, on the second voyage south from Lyttelton and landed at Evans Cove in Terra Nova Bay to carry out a six weeks' sledging programme. Pack ice blocked the Terra Nova's attempts to collect the men before the end of February and return them to Cape Evans. After two more attempts the ship had to turn north for Lyttelton early in March.

As a result Campbell and his men were left on Inexpressible Island with no hut, thin summer clothing, and skeleton rations for six men for a month. When gales ripped their tents they dug an ice cave in which they lived from March 17 to September 30, supplementing their scanty rations with seal meat and blubber, and penguin flesh.

In the spring Campbell led his party, weakened by their privations and 26 weeks in a cave where they could not stand upright, on a 320km man-hauling journey south down the coast. Surgeon Lieutenant Edward Atkinson, left in command at Cape Evans, knew of the Terra Nova's earlier attempts to pick up the party. By the end of March he was morally certain Scott and his companions were dead. He decided to search for the bodies in the spring but first to attempt to relieve Campbell's party before the winter closed in.

Atkinson believed that Campbell's party would probably try to reach Cape Evans. With three other men, Charles Wright and Petty Officers Thomas Williamson and Patrick Keohane, he made a dangerous journey over the sea ice to Butter Point, arriving on April 20. Because the ice was moving out of the area the party had to turn

**Tins of English beef suet supplied to the 1910-13 expedition. A scrap of paper in the box carried a recipe for suet pudding.**

**Photo: Garth Varcoe**



back, leaving behind a depot of two week's provisions with the hope that Campbell's party would reach it.

## HUGE STACK

When Atkinson left Hut Point on October 29 to search for Scott's party, Campbell's party struggling south was only a few days away from Butter Point. It arrived on November 2 to find what Raymond Priestley, one of the party, described as a "huge stack of cases which must have contained provisions enough to keep us all going for months. The miscellaneous heap of cases contained among other things oatmeal, biscuits, butter, lard, sugar, chocolate, bacon and hams, jam, tea, candles, Homelight lamp oil and a dozen other things... Crowning all was a large bamboo with a tin lashed to it and a note from Atkinson inside the tin..."

With food from the depot and some left by Griffith Taylor's party at Capes Roberts and Bernacchi, Campbell's men reached the hut at Cape Evans after 37 days of sledging. After 75 years much of what they left behind has deteriorated so much that it can no longer be preserved. But Mr Varcoe was able to select a few items — sardines, suet, jam, pemmican, powdered egg, candles, milk powder, and a rusted fuel tin — which the Antarctic Division has agreed will be placed with other relics of Scott's last expedition in the Canterbury Museum. They will serve also as a recognition of two quiet, modest men — Atkinson and Campbell — whose concern for the lives of the men they led was overshadowed by the tragedy of Scott and his party.

*"James Pigg"*

## Last of Scott's men now 98

*Former Chief Petty Officer William Burton, now the last of Scott's men who went south 75 years ago, was 98 on April 7. Both the Royal Navy and the Royal New Zealand Navy remembered the occasion and the man who joined the Terra Nova from H.M.S. Indomitable and made three voyages to McMurdo Sound with Scott's 1910-13 expedition.*

*From Britain's First Sea Lord and Chief of Naval Staff, Admiral William Staveley, came a message to Bill Burton sent by the Admiralty through the British High Commission in Wellington: "I wish you health and happiness and assure you that the great and heroic deeds of the famous expedition are not forgotten. With my best wishes and those of the Royal Navy."*

*New Zealand's Chief of Naval Staff, Rear-Admiral L.J. Tempero, sent best wishes on behalf of the Royal New Zealand Navy and on his own behalf: "Your contribution to an epic achievement remains an inspiration to us all." Rear-Admiral Tempero visited Scott Base and Scott's huts at Cape Evans and Hut Point last season.*

*New Zealander's wintering in Antarctica, and those at the Antarctic Division, Department of Scientific and Industrial Research, also remembered Bill Burton. On their behalf Mr R.B. Thomson, director of the Division, and Mr K.O. Clegg, information officer, called on him with a gift and a card to wish him well. They knew that Bill Burton went back to McMurdo Sound in the summer of 1963 to visit Scott Base to see once again the historic huts at Cape Evans, Hut Point and Cape Royds.*

*Way back in 1955 Bill Burton joined the Canterbury branch of the New Zealand Antarctic Society. The president of the society, Mr H.W. Burson, sent birthday greetings and a gift to its oldest life member — his honour dating back to 1964 — from members in New Zealand and 20 other countries.*

*After his return to England in 1913 Bill Burton, who was London-born, went back to the Royal Navy and served in destroyers at the Battle of Jutland and in the Dogger Bank and Heligoland actions. He came to Christchurch in 1926 and has remained there ever since.*

## Unknown OBE for service with Ross Sea Party

Twelve medals awarded to Commander J. R. Stenhouse, and sold at Southey's on June 27, 1985, included an OBE "for valuable service as Master of S. Y. Aurora" during Shackleton's Trans-Antarctic Expedition 1914-16. It was previously thought by experts that there had been no awards other than the Polar Medal, also in the set, for service with this expedition.

The medals were sold by the Commander's daughter, Mrs J. P. Mantell and acquired by Messrs Spinks and Sons, London dealers, for £4,620 on behalf of an unknown buyer.

Born on 15 November 1887, Stenhouse came from a family famous in their day as builders of clippers — Birrel, Stenhouse and Company — based in Dumbarton. He first went to sea in 1903 and was one of the last men to gain a Masters certificate for the square-rigged sailing ships.

On 1 August 1914 he was appointed a sub-Lieutenant in the Royal Naval Reserve and joined Shackleton's expedition the same month initially as Chief officer of the Aurora under Lieutenant A. L. A. Mackintosh, R.N.R.

### Two years

Prepared, if necessary for two years in the Antarctic, the Aurora was instructed to proceed to the Ross Sea, make a base at some convenient point in or near McMurdo Sound, land stores and equipment and lay depots on the Great Ice barrier in the direction of the Beardmore Glacier for the party Shackleton hoped to bring overland from the Weddell Sea coast. It was anticipated that the transcontinental journey would be completed by February 1916 and return on the Aurora. If the party did not appear Mackintosh was to call the following year.

Heavy ice conditions prevented the Aurora from reaching Cape Evans until January 16 from when she worked southwards until on January 24 she was

within nine miles from Hut Point. Mackintosh made the ship fast and left with the second depot laying party instructing Stenhouse, now in command of the ship, to select a base, land a party and winter the Aurora north of Glacier Tongue.

With the ice constantly on the move and the absence of shelter from severe blizzards it was not until March 1915 that a suitable anchorage could be found. The chosen position was at Cape Evans immediately out from the hut erected by Captain Scott on his last expedition and on the 14th of that month the ship was moored about 40 yards offshore. A further party was landed and unloading of supplies was proceeding slowly.

By 6 May the ice was in and people were passing freely between ship and shore when by 11 p.m. a forty mile an hour gale blew up from the south, a direction from which there was no shelter. By 3 a.m. the



following morning the ship and the ice had gone; Stenhouse recorded:

- 4 p.m. — Wind freshening with blizzardly appearance of sky.
- 8 p.m. — Heavy strain on after-moorings.
- 9.45 p.m. — The ice parted from the shore; all moorings parted —....slowly as we disappeared into the Sound the light in the hut died away.

## Drift

The Aurora was to drift helpless in the pack for ten months. Her rudder broke on July 21, a jury-rudder was made and ready to be shipped from August. By September she was approximately 700 miles from Cape Evans and still drifting north. The floe broke up on February 12 when with foresail and fore topmast stay-sail the Aurora moved slowly north. Temporary repairs were made to broken stern timbers and to ease leaks near the propellor shaft. On 1 March steam could be raised, although the fires were mostly banked.

After two more anxious weeks the Aurora cleared the last of the pack ice at lat. 62.27.5' long 157.32'E. "We spliced the mainbrace and blew three blasts of farewell of the pack with the whistle" wrote Stenhouse.

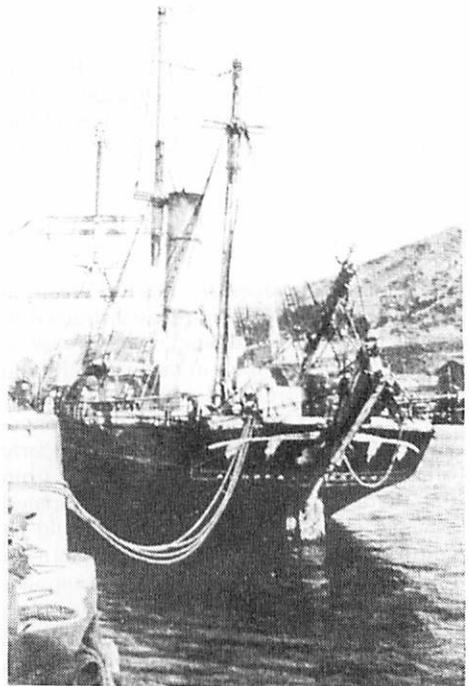
## Battered ship

With a battered ship, insufficient coal to make best use of the engines and the rudder, when it could be lowered, requiring constant attention, the Aurora headed north at times making no progress in the persistently heavy weather conditions.

On March 23 radio contact was established with Bluff Station in New Zealand and on April 2 the ship was taken in tow by a tug despatched from Port Chalmers. The Aurora reached safety the following morning. In June Shackleton, at Port Stanley in the Falklands after his ordeal, cabled Stenhouse: "Accept yourself, Convey staff congratulations safety and appreciation services"; the original telegram was sold with the medals.

Captain J. K. Davis took over command of the Aurora for the return journey south to collect the stranded members of the Ross Sea Party and Stenhouse returned to England to the Chatham Gunnery School for a training course and subsequent distinguished service in "Mystery Ships". In 1918 he was assigned to "special service" with the Syren Force in North Russia. He travelled to Murmansk with Shackleton and other polar comrades and helped to train members of the North Russian Expeditionary Force in methods of polar transport and housing.

Between the wars he was involved with the Discovery Investigations Committee. This was derived from an Inter-departmental Committee on Research and Development in the Falkland Islands originally established in 1917 by the Colonial office and which initiated biological studies in the Southern Ocean with particular reference to whaling. Stenhouse was responsible for re-equipping and re-rigging Scott's old ship



*The Aurora with the jury-rudder*

and from 1925 to 1927 commanded her while she was engaged on whaling and oceanographic research and also during the voyage to Wiencke Island in 1927.

At the outbreak of the second world war Commander Stenhouse rejoined the navy serving first in the Thames and Medway Examination Service and later with the

Commander-in-Chief East Indies. In 1941 he joined a shore base in Aden and during an operation on 12 November was reported missing, presumed drowned.

*(Antarctic is indebted to Southeby's, Mrs J. P. Mantell and Mr David Yelverton for the information in this article.)*

## Obituary

# A Tasmanian pioneer of Ross Sea whaling

Tasman Louis Young, who died in Christchurch early this year, was one of the pioneers of whaling in the Ross Sea more than 60 years ago, not as a chaser captain or harpooner but as a labourer aboard the first factory ship, Sir James Clark Ross. Known to everyone as Tas he spent 57 of his 85 years in the port of Lyttelton and was Tasmanian-born. In the 1923-24 summer he sailed south with Captain Carl A. Larsen's Norwegian expedition on an Antarctic voyage which lasted four months.

A veteran whaler, Larsen, who had explored in Arctic and Antarctic waters, had noted reports by Scott and Shackleton on the numbers of whales in the Ross Sea. With Magnus Knonow, of Christiana, he formed the HVALFANGERSELSKAP RossHavet Company to catch whales in the Ross Sea and its environs. He bought the 13,000-tonne steel vessel Mahronda, of the Anchor-Brocklebank Line, built in 1905 at Belfast by Harland and Wolff, and converted it into a factory ship.

In November, 1923 the whaling fleet of six vessels sent out from Sandefjord, arrived in Hobart. There were five chasers, Star I, II, III, IV and V with tonnages ranging from 130 to 70. Two built in the United States had been used in Alaskan waters, and three were Norwegian veterans from South Georgia.

For his pioneer expedition Larsen engaged a noted ice pilot, Commander H.R. Gjertsen who, as a young Norwegian Navy lieutenant, served with Amundsen as second mate aboard the Fram. Ten years

after his voyage with Larsen, Commander Gjertsen made two more voyages to the Ross Sea as ice pilot for Byrd's 1933-35 expedition.

Larsen's five chaser captains were among the best harpooners in Norway. Captain A. Kaldager, sailing master of the Sir James Clark Ross, took Star I on two voyages in 1924 into the McMurdo Sound area, penetrating the pack ice as far as Cape Royds on the second. On board the second time was Captain G.S. Hooper, of the New Zealand Marine Department. Newly appointed as the first Administrator of the Ross Dependency, he travelled aboard the mother ship to watch New Zealand's financial interests.

Ten Australians, nine from Tasmania, joined the Sir James Clark Ross while she was in Hobart. Among them were Tas Young, who had been at sea since he was 17, and Alan (Curly) Villiers, a young journalist with seagoing experience, who had arranged with a Hobart newspaper to supply articles and photographs. They were

both signed on as workers at an agreed rate of pay plus a bonus of one-tenth of a penny for each barrel of oil from the catch.

Loaded with provisions for two years and with 10,000 tonnes of Welsh coal in her bunkers, her bow strengthened by a sheathing of French Congo hardwood and with the most powerful radio ever installed on a ship, the Sir James Clark Ross and her attendant chasers were well-fitted for the voyage which began on November 30, 1923. Macquarie Island was the first stop where there was an opportunity to go ashore while the chasers sought in vain the elusive whale.

This was the only occasion on which Tas and his companions were able to relax. The expedition entered the pack ice on December 13 and very soon the Ross Sea became a workplace where toiling long hours in harsh conditions were accepted as normal.

## Antarctic circle

On December 17 the expedition crossed the Antarctic Circle, the first whaling fleet ever to do so. The Sir James Clark Ross became the largest ship to enter Antarctic waters, a far cry from the small ships in which the early navigators and explorers sailed into the Southern Ocean.

By December 19 the ships were beset in the pack and the crew spent many long hours sawing them free. Their first destination was the Bay of Whales where the fleet arrived on Christmas Eve without Star II. By Christmas Day grave fears were held for Star II which had not kept up with the fleet and had been missing several days.

A depot was established on the shore in case the missing chaser turned up. This was set mainly by the Australians and included 10 tonnes of coal, four cases of biscuits and kegs of salt-beef and flour. The depot was topped by a large Norwegian flag on a pole. It was desperately hard work which continued through the night but not a man breathed a whisper of complaint as the heavy loads were man-hauled up an icy slope.

After subdued Christmas Day festivities the mother ship and chasers turned north again. The chasers were bunkered on December 26 and that evening Star II was sighted steaming towards them. She had been beset for six days and was now desperately short of coal and water.

Soon after receiving bunkers Star II redeemed herself by taking the first whale on December 27. It was a blue whale as were others caught on the same day. The derricks fitted on the Sir James Clark Ross were adequate for right and humpback whales but could not handle blue whales. As the factory ship had no stern slipway, Larsen's original plan was to moor her in a sheltered inlet so the catchers could bring captured whales in to be hoisted on the deck for flensing. As this was not possible, the whales had to be flensed alongside the ship and the blubber strips hoisted aboard.

Discovery Inlet on the Ross Ice Shelf at 170 deg. W filled the bill for such work and the Sir James Clark Ross entered the little ice harbour on December 31, anchoring in its placid waters at 512m. There she remained except for one or two periods until March 5.

## Operations

Whaling operations then began in earnest. Soon the factory ship workers, crew, flensers, blubber gang, became locked in the now familiar but seemingly endless routine of hard work, long hours, and harsh conditions. Tas Young noted in his diary, now held in the Canterbury Museum, that the cold was so intense even the ship's engineers wore overalls and fur caps in the stokehold.

Two whales had to be processed at a time, one on each side of the ship, and eight to 10 were flensed in a day. Every day was the same. The men were called from their bunks at 5.50am to start work at 6am.

Breakfast — brown bread, margarine and fried whale steak and onions — was taken from 8am to 8.30am. Dinner — pea soup, potatoes and salt beef — was then

taken at noon and was followed by a welcome tot of whisky. An afternoon break at 3.30pm allowed the cold and weary men time only to eat a slice of bread and margarine. At 6pm work ceased except for the blubber gang which had to clean the decks before the blood and oil froze. But after a meal — fish balls and coffee — at 6.30pm everyone turned to and hauled the flensing boats aboard.

By early February the tally of whales was poor. Not nearly as many as expected had been sighted. The chasers had to cope with stormy seas and pack ice, and much of the equipment was unsuitable. With only the oil from 75 whales Larsen suggested that the expedition go north to the West Australian grounds. The crew refused.

With the approach of winter the stress of many weeks at sea brought personal problems. Trouble between some of the officers and crew resulted in two strikes. Although they lasted but a few hours they surely must have been the first industrial action ever taken south of the Antarctic Circle.

(In the 1920-30 season Tasmanians aboard the N.T. Nielson-Alonso refused work because the food was bad. The captain read the riot act — the food improved.)

## Blizzards

Early in March the ships were battered by a succession of blizzards but Larsen, still hoping for the biggest cargo of oil possible, waited until it was obvious that the whales were moving north. When newly formed pack ice was so thick that a blizzard did not break it up he gave the order on March 5 to head for home. The fleet reached Campbell on March 21 and then proceeded to Stewart Island where the chasers went into winter quarters at Paterson Inlet. On April 9 the Sir James Clark Ross entered Port Chalmers.

In his diary Tas Young describes how the Australians were paid off at Port Chalmers before the factory ship sailed for Europe. Each man received £12 for his three months' work. Tas also notes that when he went to say goodbye to Captain Larsen on

behalf of the group the old man was very moved and apologised for the poor returns for so much hard work.

(The actual return was 17,791 barrels from 221 whales; Larsen had expected at least 40,000 barrels and had hopes of 60,000.)

After his apology Larsen gave each man another £5 from his own pocket and offered to take them to Norway. None accepted.

Tas, born at Stockport, Tasmania, in 1900, went to sea at the age of 17 and was master of the Huon Channel and Peninsula Shipping Company's small steamer Breone when only 22. After his Antarctic experience he continued seafaring until his marriage in 1928 when he settled in Lyttelton. Before his retirement in 1965 he was employed as a master stevedore for the Shaw Savill and Albion Company.

Tas never forgot his whaling days or his experiences in great waters. Before the Second World War he was often a guest speaker on the radio and also conducted a monthly programme called "Ships and the Sea".

In later years Tas transferred his memories of Ross Sea early whaling to canvas. He became an amateur painter of some merit and is represented in the Canterbury and Stewart Island Museums by several pictures of whaling scenes in Discovery Inlet. A small oil of a chaser in the inlet which he contributed to the exhibition of Antarctic art organised by the New Zealand Antarctic Society to mark its 50th anniversary, was highly praised by professional artists who saw it.

Baden Norris

**Footnote:** Alan Villiers went on to record his impression of the voyage he shared with Tas Young in his first book, "To the Frozen South", published in 1974. He never returned to Antarctica but roamed the seven seas for more than a quarter of a century in sailing ships, Arab dhows, and old-time square riggers. As master and owner of the full-rigged ship *Joseph Conrad* he sailed her round the world in the tracks of Cook's *Endeavour*.

## BOOKS



### The Island of South Georgia

*'The Island of South Georgia'*

Written by Robert Headland, published by the Cambridge University Press, 1984  
ISBN 0 521 25274 1, hardback 293 pp. 245mm x 195mm, £14.95.

In the 82 years since the first permanent settlement was established on South Georgia the island has amassed a fascinating history which fully justifies a book such as this.

It is a 293 page quality hardback with chapters covering every aspect of the island's short history, illustrated with 139 black and white photographs, drawings, maps and charts. There are 10 appendices containing technical information and an extensive bibliography.

It doesn't take long for the reader to conclude that South Georgia is a rugged mountainous island that has presented formidable challenges to man. Attempts at farming cattle and sheep failed because of the long cold winters; there were shipwrecks in almost every cove; and even the whales finally beat man with diminished numbers.

The section on whaling is the most thorough and detailed in the book, which is understandable because it is the activity that created by far the most impact. There are sections on the physical sciences, natural history, expeditions dating back to 1882, philately and the Argentinian invasion — all of which could fill books in their own right.

In his preface Bob Headland states that the book "attempts to be a detailed account of South Georgia, which is one of the few places on earth where this may still reasonably be encompassed in one volume." This statement can be viewed with some scepticism when it is realised that the definitive bibliography on South Georgia runs to 1344 publications, and that this book attempts to cover the scientific, political, human and geographical history of the island.

But this should not detract from the huge amount of information it contains which should more than satisfy the casually curious. Bob Headland's style is to present the material in factual form with little attempt at narrative, which makes the book more of a reference work than a bedtime read.

As one who has visited this remote island I greatly value my copy of this book and I am indebted to Bob Headland for the painstaking work he has put into it. For anyone planning to visit the island, this book is a must — there is none other with such an all-embracing coverage.

Alan Knowles

**(The reviewer, Alan Knowles of Wellington, New Zealand, was deputy leader of a New Zealand expedition to South Georgia 1984-85.)**

### Erratum: *Antarctic Diary*

*In our December issue Vol 10. No.12 Trygve Gran's Antarctic Diary 1910 — 1913 edited by Geoffrey Hattersley-Smith was reviewed by Jan and Arnold Heine. The statement that Gran had been turned down as a member of Amundsens party has subsequently been drawn to our attention. Gran was not turned down as a member of Amundsens party but he had been planning his own Antarctic expedition when he had approached the polar veteran Amundsen to discuss the plans. He found that Amundsen showed no interest and was unforthcoming to his questions — understandably in the light of later developments. P. 11 Antarctic Diary. Ed.*

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