

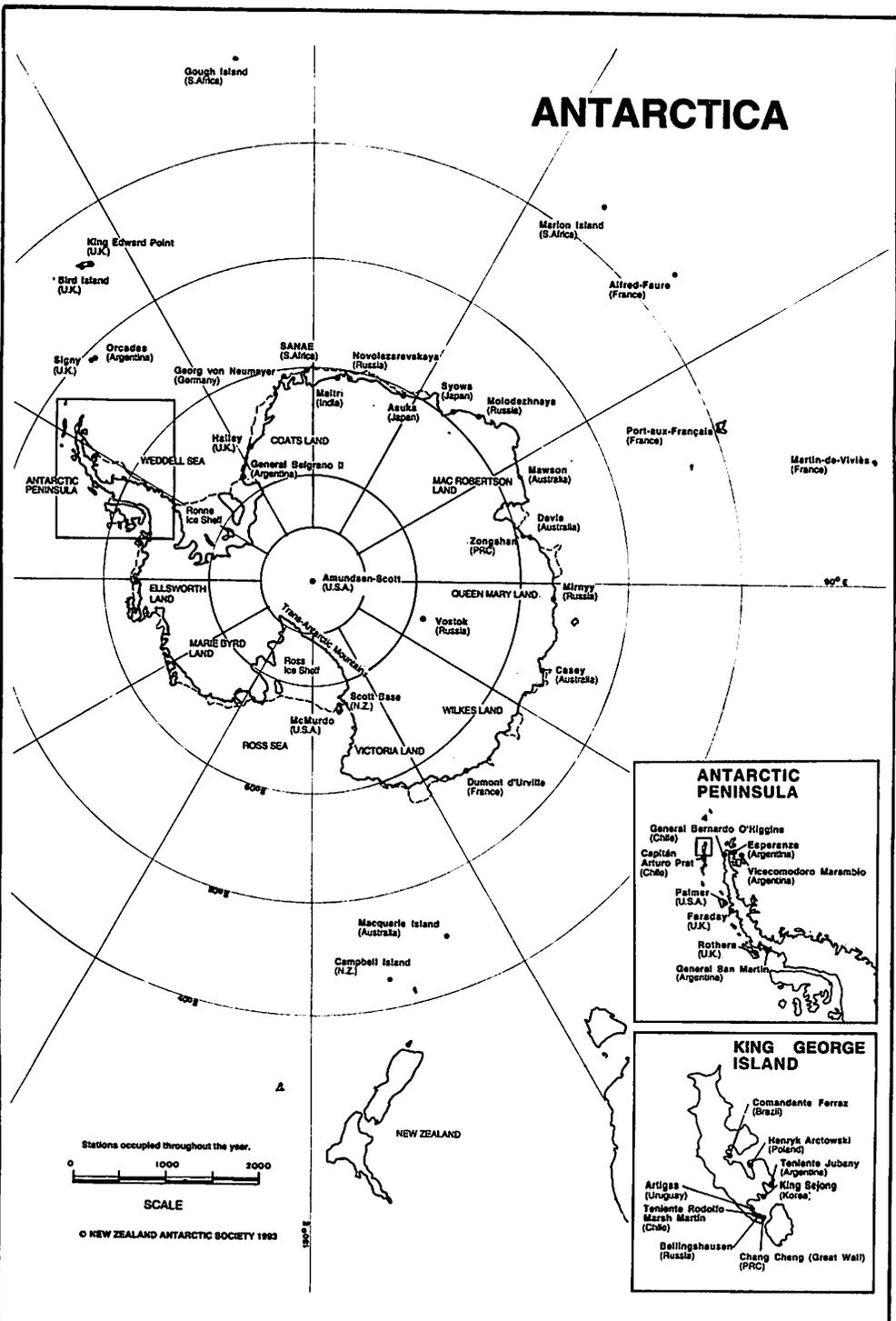
ANTARCTIC



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ANTARCTICA



ANTARCTIC PENINSULA



KING GEORGE ISLAND



Stations occupied throughout the year.

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Cover: The French supply vessel l'Astrolabe takes advantage of the channel cut by the Kapitan Khlebnikov on her way to Dumont d'Urville.

Photo: Tim Higham

Treaty Brief

XIX Antarctic Treaty Consultative Meeting

The XIXth Antarctic Treaty Consultative Meeting was held in Seoul, Republic of Korea between 8 and 19 May, 1995. It was attended by representatives of all the Consultative parties. Of the 16 non-consultative parties to the treaty, 12 attended but only Canada, Greece and Switzerland participated in the entire meeting.

Observers and experts comprised representatives from CCAMLR, SCAR, COMNAP, ASOC, IAATO, IHO, IUCN, UNEP and WMO.

The first week of the meeting was devoted to the work of the Transitional Environmental Working Group (TEWG) and to the meeting of the Group of Legal Experts on Liability. Dr Pietro Giuliani of Italy chaired TEWG, a group set up by the XVIIIth ATCM to provide advice and recommendations to the XXth ATCM on the implementation of the Protocol. During the second week the two working groups met. The first was chaired by Ambassador Dietrich Granow of Germany and the second by Dr Roberto Puceiro of Uruguay.

TEWG

Six items were on the agenda. They included:

Environmental impacts of tourism

TEWG noted the need to consider measures to minimise the impact from tourism and recognised that existing information is insufficient to detect the environmental impact on Antarctica. Parties were urged to support activi-

ties to identify sites affected by tourism and control sites unaffected by visitor activity. The United States submitted a paper on the work being done on the Antarctic site inventory and suggested it might be useful for the parties. The nature, magnitude and trend of cumulative impact of all human activities in Antarctica was noted as also needing consideration. SCAR was asked to report back on this issue to the XXth ATCM. It was also asked to advise on the designing of baseline assessment and monitoring programmes for the impact of tourism.

Environmental monitoring and data requirements

SCAR presented its report on the use of incinerators in Antarctica. Nine countries, including New Zealand, are still using incinerators. It was agreed that wherever possible waste should be removed from Antarctica for disposal, that work should be done on minimising emission impacts and that incinerators should be operated by trained staff only.

Implementation of EIA procedures

The meeting agreed that a list of completed Initial Environmental Evaluations (IEEs) and Completed Environmental Evaluations (CEEs) carried out in the preceding calendar year would be published as an annex in the final report of the next and subsequent ATCMs. New Zealand and South Africa presented a paper outlining an approach on follow-up procedures in re-

spect of any changes required to an activity once a final CEE has been completed. New Zealand also circulated the EIA prepared by Southern Heritage Expeditions for the Ross Sea tour activities during the 1993/94 season. Many delegates commented that the paper provided a model for future EIAs.

Antarctic Protected Area System

New Zealand and the UK submitted revised management plans for Antarctic protected areas. New Zealand proposed that guidelines be introduced for the designation of historic sites and monuments. These guidelines have been developed by New Zealand's Antarctic Heritage Trust. New Zealand's proposals for listing sites were prepared by the AHT and co-sponsored by Norway and the UK.

Specific Environmental Protection Measures

The meeting considered papers on oil spill controls and measures to mitigate against the introduction of non-native species and plants and animals through human activities. The Netherlands introduced a proposal on the application of the "best available techniques", and the meeting decided to ask COMNAP to consider the desirability of using such a concept for protecting the Antarctic environment.

Global change

SCAR told the meeting it has appointed a project officer to improve interdisciplinary communication lines with the Group of Specialists on Global Change in the Antarctic.

Official opening

The official opening of the XIXth ATCM was held on 15 May. After the opening addresses the chairmen of the working groups were elected and the addi-

tional opening addresses given by the delegations of the participating nations. The agenda was then adopted and the reports received. At the conclusion of this, the plenary session, the working groups were constituted.

Working Group 1

This considered the relevance of developments in the Arctic to the Antarctic; the Protocol on Environmental Protection to the Antarctic Treaty which focused on implementation, liability and relations with other environmental treaties and the operation of the treaty system in which the secretariat was one of the key items.

Liability Meeting

The Group of Legal Experts on Liability, chaired by Professor Ruediger Wolfrum discuss proposals for a Liability Annex based on his "third offering". After considering suggestions a "fourth offering" is now being prepared by the Professor. The Group is to meet intersessionally in Belgium from 27 to 30 November and again at ATCM XX.

The Secretariat

Discussion on settling the location of the Secretariat continued without resolution. Australia focused on the detail of a secretariat and in a working paper co-sponsored by Italy and South Africa, it proposed a number of organisational, legal and technical aspects involved in the establishment of a permanent secretariat. This is now the basis for continued discussion with planned intercessional meetings. An interim solution may be considered at the next ATCM but in the meantime the question of a permanent location remains on the agenda for future meetings.

Working group II

Agenda items comprised tourism and non-government activities, envi-

ronmental education and training and inspections under the Antarctic Treaty. Under this item it was reported that inspections were undertaken by the US and Argentina during the 1994-95 season. The US inspected Dumont D'urville (France), Mirny (Russia), Davis (Australia), Zhongshan (China), Syowa (Japan) Neumayer (Germany) Signy (United Kingdom) and Orcadas (Argentina). The Argentinian team inspected King Sejong (Korea), Rothera and Signy (United Kingdom.) No violations to the treaty were observed.

Russia, possibly with Belgium, may carry out inspections in 1995-96. International Antarctic Scientific and Logistic cooperation, Antarctic Meteorology, Telecommunications and related services, data management and data bases and global change all received attention with presentation of papers and some discussion.

The Plenary resumed on May 19.

New Zealand delegation

Seven delegates represented New Zealand at the Treaty meeting. They were Dr Stuart Prior, head of the Antarctic Policy Unit at the Ministry of Foreign Affairs and Trade (MFAT), Don MacKay, director of legal division of MFAT; Louise Sparrer APU MFAT, Michael Prebble, Ministry for the Environment Gillian Wratt, Director of the New Zealand Antarctic Programme, Colin Harris, International Centre for Antarctic Information and Research, Christchurch and Alan Hemmings, representing the NGOs.

The delegation reported that New Zealand's strategic approach of concentrating on the practicalities of implementing the Madrid Protocol was indicated by the solid achievements in the Transitional TEWG. New Zealand demonstrated that on many issues it is at the forefront in developing processes and practices needed to turn the

Protocol into a reality but it would have to continue to work hard with like minded countries to ensure the momentum of implementation was maintained.

This year the delegation had six main objectives:

- support the early establishment of the Treaty Secretariat
- support the development of practical measures that will make the Protocol a working reality
- support the development of practical measures to improve the ATCM meeting procedures
- introduce a prototype tourism database for discussion with a view to future use by all Treaty parties
- support the work and priorities of TEWG
- continue to support development of an Annex on liability

The XXth ATCM will be held in the Netherlands from 2 April to 3 May 1996. The XXIst will be held in New Zealand.

Penguin politics

In the March 1995 issue of *Antarctic* (Vol 13, No.9) we featured an article on Kelly Tarlton's entitled "The Northernmost Hut. It has been brought to our attention that the article was not terribly clear as to the outcome of the organisation's investigation into collecting penguin eggs from Antarctica. The author of the article and head curator Craig Thorburn wishes to make it quite clear that the collection of Adelie and Emperor chicks was a option explored in 1993 and subsequently ruled out. Any potential collaboration with NSF science events, was at a personal and informal stage at the time. Kelly Tarlton's has no intention, now or in the future, to collect either Adelie eggs or abandoned' Emperor chicks from Antarctica. We apologise to anyone who found that section of the article misleading.

IWC

Legal basis of Southern Ocean Sanctuary being questioned

Continued "scientific whaling" by Japan in the Southern Ocean whale sanctuary area resulted in strong resolutions being adopted by a large majority at the 47th annual meeting of the International Whaling Commission. By the conclusion of the meeting, held in Dublin from 21 May to 2 June, Japan had challenged the legal basis of the Commission's decision to establish the sanctuary. Fuller discussion of this is now on the agenda for next years meeting. In the meantime Japan may well expand its whaling programme in the area.

Countries attending this years meeting included Antigua, Argentina, Australia, Austria, Barbuda, Brazil, Chile, China, Denmark, Dominica, Finland, France, Japan, Germany, India, Ireland, Mexico Monaco, Netherlands, New Zealand Norway, Republic of Korea, Oman, Russian Federation, St. Lucia, St. Vincent, Solomon Islands, South Africa, Spain, Sweden, Switzerland, United Kingdom, USA,

The establishment of the sanctuary was a key feature of the 46th meeting held at Puerto Valarta in May 1994. It was proposed initially by France in March 1992 and covers the area south of 40 degrees (South). At the meeting in May of that year the French submitted a detailed paper setting out arguments for establishing a large sanctu-

ary covering the feeding ranges of at least one biological population of each of the globally distributed species of large whales. By that time the concept had the support of a large number of anti-whaling countries and several leading environmental groups. France had hoped to take the issue to the vote that year but under the commissions rules, a three quarters majority was required to establish the sanctuary and the numbers were insufficient. A longer term strategy was required and the meeting agreed a resolution that kept the sanctuary alive for further discussion in 1993.

The following year the meeting was held in Kyoto and Japan pursued its reservations. There was still insufficient support for the proposal to be adopted but Chile, Sweden and Switzerland co-sponsored a resolution that acknowledged progress in the debate, identified the differences of opinion and paved the way for an intersessional meeting in Australia. This meeting addressed the outstanding legal, political, ecological, geographical, management, financial and global issues relating to the establishment of the Sanctuary which had precedents within the framework of the IWC's longer term programme.

Recommendations were formulated to enable the IWC to take a "full deci-

sion" on the Sanctuary at its 1994 meeting and a further intersessional meeting was held in Norfolk Island in February 1994 under Swiss chairmanship. Views were freely aired and the final recommendation stated that there were "no irreconcilable objections to establishing a sanctuary in conformity with Article V of the 1946 Convention among members of the Working Group, and that a sanctuary can be created by the Commission if its members so decide."

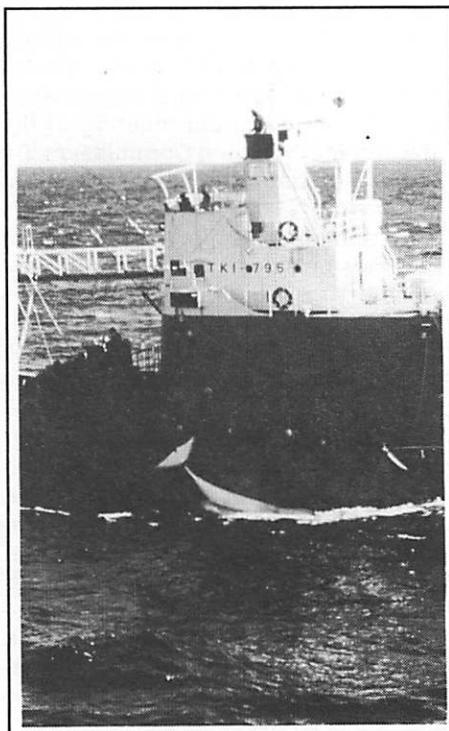
The next meeting in 1994 was held at Puerto Vallarta and the sanctuary was the main item on the agenda. Approval was far from certain and there were now difficulties with the French suggestion that the northern boundary be 40 degrees south latitude. Countries such as Chile wanted the boundary to be 55 degrees while others preferred it to be at the equator.

The Sanctuary still made good scientific and management sense and when put to the vote it secured the support of 23 member countries with Japan only voting against it. Norway did not participate and six countries abstained.

Consensus now indicated that the Sanctuary was justified and should be established and it was to come into effect 7 December 1994 with the proviso that countries had until September 7 to lodge reservations. Only the Russian Federation and Japan did so and the Sanctuary has no legal effect on them. Japan's reservation relates only to the southern ocean minke whale which is the most populous species in the area. It continues to hunt this species for "scientific purposes" which are not covered within the context of the Sanctuary. Moreover, Japan's lodging of a reservation would allow it to resume commercial hunt of minke whales if the moratorium is ever lifted. In the meantime the Russian Federa-

tion has withdrawn its reservation.

Despite strong disapproval from the IWC Japan announced its intention to take up to 330 whales for scientific purposes in the Sanctuary area and over last summer sent the *Nisshin Maru* and the *Toshi Maru No. 18* south to obtain them. The fleet was supported by the *Oriental Falcon*, a vessel which carries the Panamanian flag and is crewed by Koreans. The figures for this years take have not been announced.



A Japanese whalercatcher at work in the Southern Ocean, an area which has internationally been declared a sanctuary. Photo: Greenpeace

At this years meeting Japan announced its intention to continue this programme. This resulted in two reso-

lutions on scientific whaling being adopted by substantial majorities. One calls for countries to refrain from issuing special permits for research involving the killing of cetaceans in sanctuary sanctuaries and the other recommends that research to assist in the comprehensive assessment of whale stocks be done by non-lethal means and that lethal research be permitted only in exceptional circumstances."

The Commission has also requested the Scientific Committee to review all lethal research programmes and report on whether they are justifiable or could be resolved resolved by other means.

In the meantime, the Scientific Committee had proposed a special intersessional meeting to review the Japanese lethal research programme

in the Antarctic. Japan has offered to host it. The scientific committee however is already occupied with the outcome of a Norwegian estimate made in 1992 of the population of minke whales in the North East Atlantic where they continue to hunt commercially. The thrust of the objection appears to be the methodology by which the Norwegians have arrived at their estimate and agreement was reached among the committee that the current figures are not accurate. Thirteen countries sponsored a strongly worded resolution urging Norway to reconsider its objection to the moratorium on commercial whaling and halt its current activities. Twenty one countries voted in favour with six against. There were six abstentions.

Towards the close of the meeting

Sue Miller, formerly of the World Wide Fund for Nature, receiving the Society's Nature Conservation Trophy from the Hon. Denis Marshall during a short ceremony in January.

*Photo:
Bill Hopper*

Story: page 404



Japan and Norway claimed that the Sanctuary had not been established on scientific grounds and had no legal basis. Japan circulated a legal opinion obtained from an American law professor questioning the decision which was argued strongly against by conservation minded countries. It was noted that the decision to establish the Sanctuary had been taken in accordance with IWC procedures and could only be reversed by an amendment to the Schedule. Japan called for the matter to be referred to relevant international institutions. France requested a close to the debate without a vote and it was ruled that the matter be discussed again next year.

In March 1995 New Zealand, Australia, South Africa, Chile, Argentina and Uruguay, which did not attend the IWC meeting, constituted the Valdivia Group. This fosters exchanges and cooperation on environmental and related scientific matters among participating nations and includes a working group on bio-diversity. Towards the end of the IWC meeting they expressed their regret that whales continue to be taken in lethal scientific whaling programmes in the Sanctuary area despite the existence of alternative ways of obtaining the information necessary for their management and conservation. This was introduced during the Sanctuary debate by Chile and endorsed by Brazil, France, the United States and Uruguay *in absentia*.

RMS

There was little progress at the meeting on the Revised Management Scheme which has to be agreed before a decision can be taken to lift the moratorium on commercial whaling. Two resolutions were however, passed. One was aimed improving mechanisms to prevent illegal trade in whale meat and called on countries to monitor and dispose of stockpiles that make it dif-

ficult to detect the illegal trade. The other dealt with guidelines for surveys to determine population estimates. Little progress was made on agreement of a system of Observation and Inspection and this remains the last element of the RMS to be negotiated.

Society's Conservation Trophy awarded for Sanctuary work

The New Zealand Antarctic Society's Conservation Trophy, awarded to organisations or individuals who have made outstanding contributions to the conservation of Antarctic flora and fauna, went in October last year to Sue Miller for her work as a scientist involved with the World Wide Fund for Nature's (WWF) conservation campaign against commercial whaling.

Sue, a marine and freshwater scientist from Howick, in Auckland, was New Zealand's representative in a 14 strong WWF team at the IWC's meeting at Puerto Vallarta at which the concept of the Southern Ocean Whale Sanctuary was adopted.

When announcing the award late last year the Society's President Dr Margaret Bradshaw, said Ms Miller, acting as spokesperson for WWF, brought balanced and informed summaries of the discussions to the people of New Zealand, but always endorsed a very positive view for the acceptance of the sanctuary. Her regular reports on radio, television and in the newspapers ensured all New Zealanders were kept fully informed of the negotiations as they took place. Without her daily dispatches the adoption of this momentous international agreement would have passed virtually unnoticed in New Zealand. Her role in making the public fully aware of the protection offered by the proposed sanctuary was an outstanding contribution to conservation.

Sue Miller is currently working in Apia, Western Samoa, as species protection officer for the South Pacific Regional Environmental Programme.

New Zealand

Six new historic sites named in Ross Dependency

Six Antarctic sites were recommended by New Zealand for listing with the Antarctic Treaty as a historic site or monument and approved at the XIX Antarctic Treaty Consultative Meeting.

The monuments are mostly associated with the Heroic Age of Antarctic Exploration. Four relate to the British Antarctic expeditions of 1901-1904 and 1910 to 1913. Two date from the Norwegian Antarctic expedition of 1910-1912 and the whaling activity of the last century.

The sites are:

Rock Hut (Granite House) Cape Geology, Granite Harbour (77deg00'E/162 deg32'E). This is a rock field kitchen which was built in December 1911 by the second western geological party of the British Terra Nova expedition of 1910-1913. It was enclosed on three sides with granite boulder walls, and used a sledge to form a roof-tree which supported seal skins anchored by heavy rocks.

Moss was stuffed in wall cracks to keep out draughts. The construction was used mainly as a kitchen with cooking done on a sheet-iron blubber stove brought from Cape Evans. It was rediscovered on 18 November 1959 by a US geological field party, which recorded many artefacts including a sledge and an ice axe. Two books were found and taken back to the United States. They were studied by paper conservators,

before being returned to their owners Taylor and Debenham. A New Zealand scientific party visited the site in October 1962 and noted the hut was still standing well, but the seal skin roof had fallen in. The ice axe was taken back to Scott Base.

On 19 December 1981, two New Zealanders and an American scientist visited the hut which was still in good condition but the sledge was beginning to disintegrate.

By 1990 the deterioration was accelerating. During a 1992 Waikato University Botanical expedition, a tobacco tin was found between two rocks about eight metres from the hut. It contained a note written by Taylor during the 1911-1912 summer to Captain Pennell of Terra Nova. The letter is now in the Scott Polar Research Institute in Cambridge, UK.

Supply Depots, Hell's Gate Moraine adjoining Inexpressible Island, Terra Nova Bay. (74 deg 56'S/163deg 48'E). This is an emergency depot consisting of a sledge of supplies and equipment, placed on 25 January 1913 at the end of the British Antarctic Expedition of 1910-1913.

The depot was originally set up on 8 January 1912 by the Terra Nova's crew, as security in case the ship couldn't return to pick them up. When the Terra Nova did return a year later at the end of the expedition, specimens were recovered and a large emergency depot

left.

It was rediscovered exactly 50 years later by a survey party. The depot contained six weeks rations for six people, a Nansen sledge, a 120 foot climbing rope, a cooker, a tent and tools. The party left everything as they found it, reporting that the sledge and tent poles were all weathered while the rope and tent were complete but rotten.

The depot was re-examined in December 1964 and January 1970, when it was reported that the artefacts were in an advanced state of decay due to 70 years of wind blast, salt spray, penguins, rust and perhaps tourists.

The Antarctic Heritage Trust proposed to remove the contents of the depot to Scott Base for conservation during the 1994-1995 season.

Message Post, Cape Crozier.

This was built on 22 January 1902 by Scott's Discovery Expedition of 1901-1904. It consists of a plot to which a metal cylinder containing an account of the expedition's movements was attached to give information to relief ships. (Lat 77deg,27min South/169deg16' East). Although weathered the message post is still standing but the record cylinder has long gone. Robert Swan of the Footsteps of Scott Expedition in July 1985 described it as a forlorn and pathetic marker.

Message post, Svend Foyn Island.

The pole, with box attached, was placed on 16 January 1895 during the

*Rock Hut,
"Granite House,
Cape Geology
Photo: Antarctic
Heritage Trust*



whaling cruise of Henryk Bull and Captain Leonard Kristensen and the ship *Antarctic*. 71deg52'S/171deg10'E.

The post was found intact by the Southern Cross expedition on 3 February 1900. It was sighted twice by US icebreakers in 1956 and 1965. Its current condition isn't known.

**Cairn at the foot of main bluff
Scott Nunataks, Queen Alexandra
Mountains.**

This is a small rock cairn at the foot of the main bluff on the north side of the nunataks placed by Lieutenant Prestrud on 3 December 1911, during the Nor-

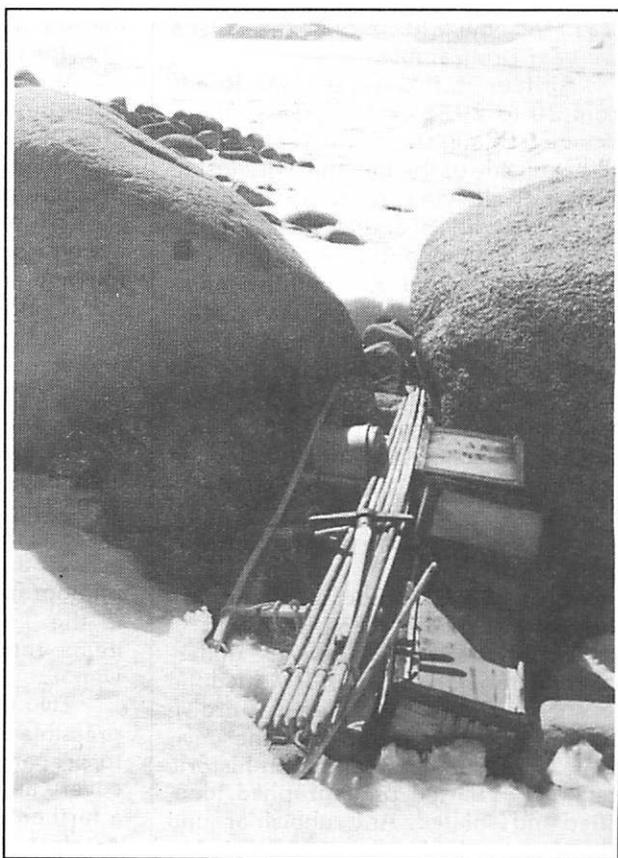
wegian Antarctic Expedition 1910-1912 77deg12'S/154deg30'W.

The site contains a collection of specimens of all the rocks found in the area. It was rediscovered by a New Zealand scientific party on 19 December 1987 but hasn't been visited since.

**Message Post, Cape Wadworth,
Coulman Island.**

A red pole with a metal cylinder attached was set up by the National Antarctic Expedition (1901-1904) on 15 January 1902 by Scott. It was placed about eight metres above sea level and the rocks behind it painted red and

*Hells Gate Moraine Depot
Photo: Dr Colin Harris*



white to make it stand out. A helicopter pilot sighted the post in the summer of

1989-1900 but it wasn't examined and its condition is not known.

AHT - for the record

Antarctic Heritage Trust work focused on five sites in 1994/95 season

The Antarctic Heritage Trust programme for last summer, 1994-95 focused on Cape Royds, Cape Evans, Hut Point, Scott Base and Inexpressible Island.

John Charles, Neville Ritchie, Roger Fyfe and ...Smith travelled to Antarctica in December to continue the Trust's five year programme.

All four staff were at Cape Royds from 20 to 29 December. Tasks there included stabilisation and repair work to the outside of the hut and work inside the hut on shelving. A report was made on the condition and security of the building, including the structural and repair work needed. Preventative maintenance and housekeeping was undertaken. Arrangements were made to remove construction rubbish, and ice and snow accumulation.

Staff also surveyed the environs and made up an action plan for restoring the site. Surveys were also done at Backdoor and Arrival Bays.

The conservation programme was monitored.

From 30 December to 7 January the team worked at Cape Evans.

Again exterior repairs were undertaken on the hut and interior work done on shelving. An action plan was drawn up for site restoration, after the environs were surveyed and non-historic items were charted, photographed, identified and isolated. Any rubbish around the site or in the hut was retrograded to

Scott Base. Empty drug containers and photoplates were returned to their original positions.

General work, including clearing ice and snow, checking security and repairs needed to the hut, and preventative maintenance and general housekeeping. UV filters were installed at specific sites for testing.

At both huts the team took every opportunity to obtain a good photographic record of the surroundings of the wider environment to be used for promotional purposes.

Two members of the event worked at Hut Point doing general housekeeping and maintenance. They replaced some floorboards and a broken window. Interior shelving was reinforced and stabilised, ice accumulations were cleared and a full report, made on the hut's condition.

The same two team members spent eight days at Scott Base from 8 January 1995, making an inventory and stock list of all the trust equipment at the base as well as a completed inventory and photographic record of all artefacts held in the Trust container, including the items returned from the Hells Gate Depot.

Two other members went to Inexpressible Island on 14 and 15 January to prepare and pack items for recovery and return to Scott Base where a further inventory was prepared. Artefacts recovered from Inexpressible

Island included: a small sledge, generally in good condition. It contained a pick, a fuel can, shovel, six leader load securing ropes, six bamboo tent poles joint joined together with a leather top plate, a Nansen-type cooker, comprising 19 aluminium cooking and eating utensils, a length of rope, three short stubby candles, one longer candle and the tattered remains of a tent, one piece of which bears the name John Edgington Makers, Old Kent Road, London.

Food boxes were found beside the sledge; two boxes of Fry's cocoa, two boxes of Tate Refined Sugar; two boxes of Limmers Flour. Left at the site under a boulder was one remnant of a tin of Fry's cocoa, part of a tin liner from a flour box and flour residue, some short fragments of rope and small frozen pieces of tent fabric.

Coverage of the work planned for the 1995-96 season will feature in our September issue.

Site of ice cave at Inexpressible Island. Photo: AHT

Scott Base team for coming season

The new team for the 1995/96 season at Scott Base has recently been announced.

The engineering services manager and mechanic is Ron Rogers of Kaiapoi. There are two base engineers, Steven Harry of Dunedin and Steve Palmer of Bulls and the electrician is Mike Pahl of Westport. These four will winter over. During the summer the engineering group is strengthened with a mechanic Jeremy Ridgen of Christchurch. There will also be three summer carpenters Richard Struthers and Mike Brophy both of Queenstown and Peter (Jock) Walton of Dunedin. The operational support manager will be Rex Hendry of Christchurch and AF Antarctic field training instructor is Jo Haines of Turangi. Wintering over will be a field support officer Chas Tanner of Dunedin,



and two science technicians David Hornstein of Christchurch and Robyn Holland of Auckland who will double as base support office. The chef for the winter is Stewart Hopkins of Wellington who will be supported by kitchenhand Ray Ellis of Oamaru over the summer, while the winter domestic is Alana Muir of Balclutha whose work will be shared

by Jacqui Unwin of Christchurch during the summer. The Senior New Zealand representative on the ice from October to December will be Malcolm MacFarlane, who on approximately December 9 will handover to Peter Brookman who will stay until the end of the season.

Belgium

Third phase of Belgian research concludes this summer

The third phase of the Belgian Antarctic research programme is scheduled to conclude this coming summer. Seven scientists are involved and they will be working with the French, Italian, New Zealand and German national programmes. The thrust of the Belgian research is science based conservation and management of the Antarctic environment and the assessment of the mechanisms through which the Antarctic and global climate interact. Emphasis is being placed a multi-disciplinary approach the dynamics of the global functioning of Antarctic natural systems, their evolution and interaction.

Initiated in 1985, the programmes are funded, managed and co-ordinated by the Federal Office for Scientific Technical and Cultural Affairs, OSTC, (formerly the Science Policy Office). Ninety-two million Belgian francs were allocated in the first phase which covered 1985-88; 96 million BEF spent on the second phase from 1988-1992 while the budget for the current phase of 1992-95 amounts to 126 million BEF. Each of the projects operates over three years and is undertaken by university

based scientists. All research costs personnel, equipment, travel, working and overheads financed by OSTC.

Seven major research lines are being pursued under three priority areas. These are studies of the ecodynamics of the Southern Ocean and interactions with the climate in which the foci are biogeochemical fluxes and cycles in the main trophic compartments; modelling the global dynamics of ecosystems and assessment of the role of "new production" in the burial of atmospheric CO₂ by the Southern Ocean. The second priority covers the evolution and protection of marine ecosystems and the foci here are the applications of predictive ecological models to simulate ecosystem responses to man-made climatic disturbances and a study of hydrocarbon spills dispersion. The third priority is the role of the Antarctic in global changes in which the two major study areas are the ocean-cryosphere atmospheric interactions and the sedimentary palaeoenvironment..

Field activities for the Belgian scientists are undertaken within the framework of voyages and expeditions organised by

other countries and such involvement is considered by the government to provide a unique opportunity to develop lines of international co-operation. As an result most research projects are increasingly contributing to, and taking advantage of the common implementation of internationally integrated studies.

Typical was the summer of 1993-94 when 16 scientists participated in expeditions to the Antarctic organised by France, Germany, Italy, Spain and the UK. They included Dr J.L. Tison who undertook a glaciological programme in Terra Nova Bay with Italianartarde IX; Mr Ph Bart, Dr De Batist and Eng. E. Van Heuverswy who studied marine geophysics aboard *R/V Hesperides* in the Bransfield Strait and South Shetland Islands; Drs F. Dehairs and L. Goeyens who, with Mr M. Semench, undertook studies in marine biogeochemistry aboard the *M/V Marion Dufresne* as part of ANTARES 2 and Dr Ch Lancelot and Ms P. Menon (Free University of Brussels) who also worked aboard the vessel on aspects of marine ecology. Eng E Maes and K Vanneste shared marine geophysics work with the Germans on ANT XI/3 aboard the *Polarstern* operating in the Amundsen and Bellingshausen Seas. Further marine ecology programmes were undertaken by Ms M. Beghyn and Ms S. Vanhove at Signy Base with the scientists from the UK and by Dr A. Goffart, Dr J.H. Hecq and Ms C Veeschkens University of Liege) who worked with the Italians on Project ROSSMIZE (Ross Sea Marginal Ice Zone Ecology) in the Ross Sea.

This coming season Dr C. Lancelot and Ms J. Piraux will work with the French on marine ecology programmes in the Indian sector of the Southern Ocean. Dr L. Goeyens will study aspects of marine biogeochemistry with ANTARES 3 with the French in the

same area. Dr J.L. Tison will again undertake glaciological work as part of Italianartide XI with the Italians in Terra Nova Bay. Professor R. Lorrain will work with New Zealand scientists on a glaciological programme in the Dry Valleys of South Victoria Land and Ms M. Beghyn and Ms S. Vanhove will work with German scientists on marine ecology programmes aboard the *R/V Polarstern* in the South-eastern Weddell Sea.

Nordic co-operation in 1995-96

Under a continuing joint logistics agreement it is the Fins turn to transport the annual Nordic expedition to Antarctica in 1995-96. The focus of the expedition, which comprises Norwegian, Finnish and Swedish scientists, is marine research. They will travel south aboard the *R/V Aranda*, a 59 metre long vessel with a gross weight of 1600 tons which is capable of carrying 28 scientists. It is owned by the Finnish Institute of Marine Research and was last in Antarctica in the summer of 1989/90.

The research programme is three-fold. It will comprise chemical sampling and hydrographic profiling during the cruise to the Weddell Sea and in the eastern Weddell Sea; Sea ice and remote sensing and air-sea interaction in the marginal ice zone in the eastern Weddell Sea and marine geological studies in the continental shelf region off the Riiser Larsen Ice Shelf. The automatic meteorological station at the Finnish base, Aboa in Queen Maud Land, which sends data out via the Argos system will be serviced and maintained but the station will not be occupied.

The marine geological programme will be jointly conducted by the Finnish, Norwegian and Swedish scientists and the air-sea interaction and marine meteorology research has been planned in cooperation with the international AnZone/SCOR group.

Earlier this year an evaluation of Finnish Antarctic programme was carried out by experts in natural sciences

and human research from Denmark, Norway and Sweden and Fins who evaluated the political and technical and commercial components of the programme. In general it was found that the research was of a high level in most fields but more results should be published. They advocated a permanent base for the organisation which should be related to their Arctic work.

Brazil

International co-operation strong in Brazilian Antarctic Programme

Seven different science projects involving ten other nations are encompassed within the Brazilian Antarctic science programme in addition to their own national programme. International logistic cooperation is also a feature.

- One of the major developments is a glaciological expedition which will be conducted in the summer of 1995/96 by scientists from Brazil, Argentina, France and Russia who are studying the physical and chemical characteristics of the King George Island ice cap.
- One of the key organisations involved in the overall programme is the National Institute for Space Research - INPE of Brazil (Instituto Nacional de Pesquisas Espaciais) which, with the Radio Observatory of Jimarca in Peru, is initiating joint investigations of the irregularities and auroral electric flows using radar equipment installed at Machu

Pichu Station on King George Island.

- Staff from INPE are also working with the University of Magallanes in Chile to develop a programme of ozone layer and UV radiation monitoring in southern South America and West Antarctica.
- In 1994 Brazil hosted the First Latin-American conference on Antarctic Space and Atmospheric Sciences, where participants from Latin America, France, the United Kingdom and the United States. They reviewed the present situation of atmospheric and space research in West Antarctica.
- The Laboratory of Glaciological and Antarctic Studies (Laboratorio de Estudos Glaciologicos e Antarticos) of the University of Rio Grande do Sul (Brazil), the Argentine Institute and the University of Magallanes (Chile) are conducting

glaciological research on possible climatically induced changes in the King George Island ice cap.

- A German research team utilised the Emioli Goeldi summer refuge, maintained by Brazil on Elephant Island, for performing geodetic survey and the installation of a GPS station.
- The University of Sao Paulo is conducting geological investigations on King George Island, with the participation of scientists from Canada, France, Poland and the United States.

Currently wintering over at Comande Ferraz on the Keller Peninsula on King George Island are a team of 19 support staff and scientific personnel. The leader, is Commander Haroldo de Oliveira Amaral. There is an executive officer, medical officer, engine technician, radio operator, electricity technician and electronic technician and a cook with nine physicists and two biologists. The physicists are Armando T. Hadano, Domingos D. Sardella, Eduardo M.B. Alonso, Joao Carlos Pencala Rae, Luiz de Souza Manguera, Liuz Gonzaga Rios Pilho, Nilson C. Amorim and Rene. all of whom are from INPE, and Claudio de O. Brandao, from the Federal University of North Rio Grande. The biologists are Mateus Sugizaki from the University of Sao Paulo and Pedro Helio Lucciari from the University of Estadual Paulista.

The team were left at the end of a comprehensive summer programme of scientific activity supported logistically by the Brazilian Air Force and the oceanographic and supply ship *Ary Rongel*.

Seven C-130 support flights were scheduled by Brazilian Air Force between Rio de Janeiro and President Eduardo Frei, the Chilean Base on King George Island. These were made between 5-9 December 1994, 26-30 December 1994. In 1995 the schedule is

for flights during 23-27 January, 6-10 March, 22 and 26 May, 24-28 July with the last 9-13 October 1995. The flight programme has operated under the command of Lieutenant Colonel Paulo Roberto de Oliveira Pereira, from the First Transportation Squadron of the Brazilian Air Force.

Acquired by the Brazilian Navy in 1994 the *Ary Rongel* was formerly the Research Vessel *Polar Queen*. Constructed by Rieber shipping A/s in Norway in 1981 and remodelled in 1986, it has a gross tonnage of 3,700 tons, cruising speed of 12 knots. The vessel is 75.20 metres long, 13 metres wide, and carries 95 passengers. It is capable of being at sea for 60 days and is ice class 1a1. Aboard are two AS 355 Ecureuil 2 helicopters which provide additional logistic support. (Recently a new helipad has been installed at Ferraz station. It is 28 metres square, built of metal with a capacity of 5,000 kg. The area is frequently used by Super Puma helicopters.)

Last summer's schedule saw the vessel leave Rio de Janeiro on 3 November 1994 for Rio Grande in Brazil before heading to King George Island, Elephant Island, Nelson Island and returning to King George prior to resupplying at Punta Arenas from late December to early January. On the next voyage it called in at the islands again but included Livingston Island in its itinerary before resupplying at Ushuaia from 17 to 21 February 1995. On its last voyage for the season it retrieved scientists from King George and Elephant Islands before going to Montevideo, Rio Grande and Rio de Janeiro where it was scheduled to arrive on April 5.

Aboard the vessel, captained by Commander Herz Aquino de Queiroz over the summer, were 17 officers, three chief petty officers, 17 sergeants, 33 sailors, maintenance crew of two and

officers of the Argentinean, Chilean, South African and Uruguayan Navy as well as an observer of the Ministry of Foreign Affairs and two midshipmen of the Brazilian Naval academy.

Additional logistic support last season was provided for a Bulgarian team visiting their station on Livingstone Island, transport from Antarctica to Brazil for a Polish winter team from Arctowski Station, transportation and lodging for Ecuadorian personnel responsible for maintaining their refuge in Admiralty Bay and transport for the Uruguayan antarctic program. A Uruguayan Navy official also visited Brazil to collect information on the sewage system at Ferraz, the process for transferring fuel from ships to station and the use of alternative energy sources. logistic support between the Brazilian and Chilean Antarctic Programmes continued.

The Brazilian expedition leader and operations manager was Captain Jose de Souza Braga and summer station manager was Commander Ewerton Monteiro da Silva.

At the centre of Brazilian Antarctic operations is Comandante Ferraz erected in the Keller Peninsula on King George Island in February 1994 to support scientific programmes. It lies at 62deg05'S/ 58deg23.5'W and is open through throughout the year.

In addition there are four Antarctic refuges, each providing accommodation for up to six scientists, which they use to support their summer activities. These are the Engenheiro Wiltgen, established in the summer of 1984/85 on Elephant Island at 61deg04'S/55deg21'W. More recently, in the summer of 1988/89, accommodation there was supplemented by the building of the Emilio Goeldi at 61.05deg04'S/055deg20'W. Astronomo Cruis was established during the 1984/85 summer season on Nelson Island at 62deg14'S/055deg00'W. Zpadre Rambo, also built

during the 1984/85 season, is located on the Keller peninsula on King George Island at coordinates 62deg10.5'S/05859W and provides logistical support for five scientists.

Additional temporary field camps were established to enable scientists to carry out glaciological activities at Hannequin Point and earth science programmes on the Fildes Peninsula

Scientific personnel last summer comprised three biochemists, seven botanists, one chemist, three meteorologists, 14 physicists, 21 biologists and four geologists. Of these four botanists were deployed to the Elephant Island refuge, seven to the Nelson Island refuge, ten geologists and one mountaineer to the Fildes Peninsula. The mountaineer, Bruno A. Sellmer, also supported four glaciologists at the Hannequin Point Campsite

Scientific programmes being undertaken at Comandante Ferraz include meteorological work, investigations into the Antarctic ionosphere, studies of radionuclides in the atmosphere, FIX-VLF propagation in the lower ionosphere, atmospheric measurements of minor constituents and geomagnetics programmes.

Much of the biological work is centred on Admiralty Bay. Scientists are researching the biochemical and physiological behaviour of marine animals, organochlorinated pesticide residues and PCB levels in the trophic chain, environmental impacts on Antarctic fish, ecophysical studies on krill and amphipods, levels of biogenic and fossil hydrocarbon in the marine environment. Larval dispersal and reproduction of benthonic mollusc are also being studied.

In the South Shetlands a comprehensive study of continental vegetation is being undertaken. A regional biooptical algorithm for the South Atlantic and Antarctic waters is being de-

veloped and the absorption process and trans-epithelial transport and phagocytosis of protein macro-molecules in the digestive system of Antarctic fish is being studied. On Elephant and Nelson islands the continental vegetation is being studied.

Earth science programmes involve mass balance, ice stream mechanisms and ice dynamics on King George Is-

land. The geological and stratigraphic correlation of the tertiary volcano-sedimentary sequences of Robert and Greenwich Islands.

Aboard the ship dynamics of planktonic organisms and biological processes in the south-eastern Atlantic Ocean ecosystem and photo-identification of Jubarte and Minke whales are among the main scientific work.

Bulgaria

Third expedition concluded

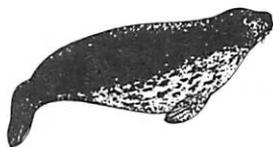
In a brief opening address at the XIX Antarctic Consultative Meeting at Seoul in Korea in May the Bulgarian representative reported the conclusion of the third Bulgarian Antarctic Expedition. The Republic of Bulgaria acceded to the Antarctic Treaty in 1978 becoming the 20th contracting party and in March 1995 it became an associate member of SCAR.

The first Bulgarian scientists went south in 1987/88 as part of an expedition organised by the University of Sofia with scientific and logistic support from the British Antarctic Survey and the Russian Institute for Antarctic and Arctic Research. During this expedition a refuge was established on the north-east side of the South Bay of Livingston Island at 62deg38'29''S/60deg21'53''W.

In 1993-94 the refuge was enlarged and used as summer base. It has been named St. Kliment Ohridski by an official Act of the President of the Republic of Bulgaria. This programme was organised by the Bulgarian Antarctic Institute and the Atlantic Club with logistic support from the Spanish Antarctic

Programme. Neither the number of participating scientists nor details of the specific programmes involved in this expedition were announced in the statement but the systematic collection of data and of samples was begun in the fields of geology, glaciology, meteorology and human medicine.

In May 1994 a three year National Scientific Antarctic programme was accepted by the Bulgarian government. It is being financed by the Bulgarian National Fund for scientific research. Biology and physics have been added to the programme and this last summer biological work was also a component of the expedition in which the scientists collaborated with the scientific Argentinean Antarctic Institute. A joint geological project was also carried out with Argentinians at a field camp on Byers Island.



United Kingdom

Operations at Signy being rationalised

Activities at the British Signy station are being rationalised with the year round facility being closed and replaced by a smaller summer-only base. This is part of British Antarctic Survey's continuing reconstruction programme at its Antarctic bases and in accordance with Annex 1 of the Protocol on Environmental Protection to the Antarctic Treaty it presented an Initial Environmental Evaluation at the XIXth ATCM. The programme also complies with the principles described in the policy document "*Antarctica 2000*" released in 1989 by the National Environment Research Council (NERC) of which BAS is a component.

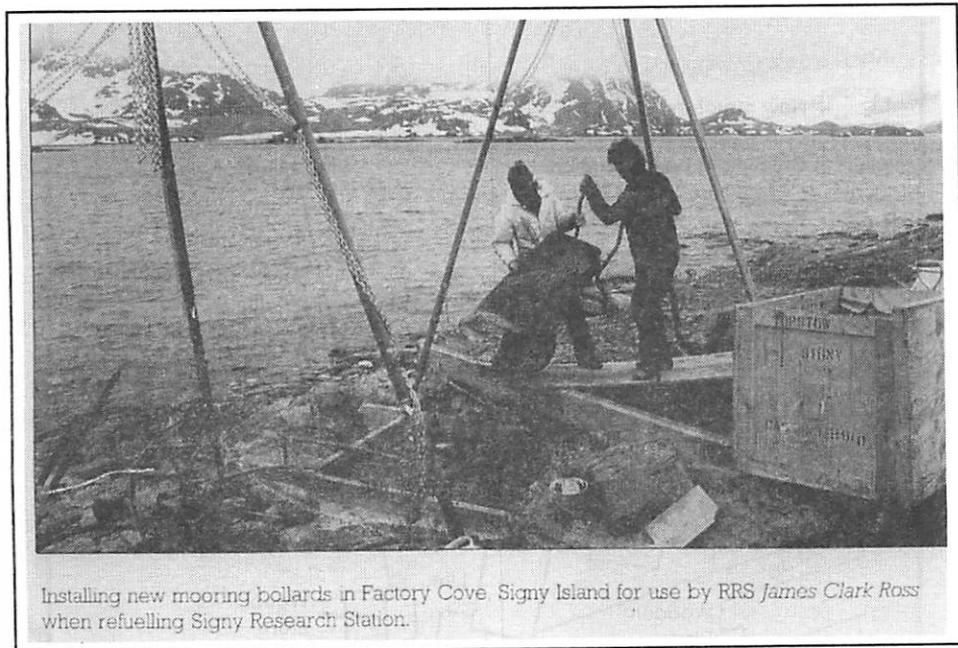
The research station is located on the east side of Factory Cove, Borge Bay where the ground consists of boulders and scree and is covered in lichens and mosses. Cape petrels and snow petrels are the most abundant breeding birds in the area and nest on Factory Bluffs some 30 metres to the south of the station. There are no penguin or seal colonies in the immediate area and no rare terrestrial or marine biota are to be found in or around Factory Cove.

Signy began operations in 1947 when a site in Factory Cove at Borge Bay on Signy Island was occupied by the Falkland Islands Dependencies Survey (FIDS). The area had previously been used as a small whaling station in 1920/21. By 1993/94 the station complex covered an area of 9800 square metres and comprised six main buildings, a

number of smaller structures, associated radio areas and a bulk fuel tank. The buildings contain laboratories, controlled temperature experimental rooms, a seawater aquarium and SCUBA diving facility, closely grouped around a small jetty and slipway. Up to 27 scientists and support personnel can be accommodated at the station during the summer but usually there have been only 24. In winter the facilities accommodate 12 to 16.

The station has been operating as the main centre for the BAS inshore marine, terrestrial and freshwater biology research programmes in Antarctic. By 1996/97 the redevelopment will make it the focus of summer freshwater research projects. The current inshore marine and terrestrial research programmes will be transferred to Rothera Station (see *Antarctic* Vol 13, No. 11) on Adelaide Island where new laboratories and accommodation are being constructed.

At Signy the proposed redevelopment involves two phase and began last summer with the dismantling and removal of SØrlle House. This summer a combined living and laboratory building is being constructed on the same site. It will contain modern laboratories for freshwater sciences, including chemical and radioisotope analysis suites. The building will also house up to eight scientists and support staff in four two person bunkrooms with an additional two person bunkroom for overflow and

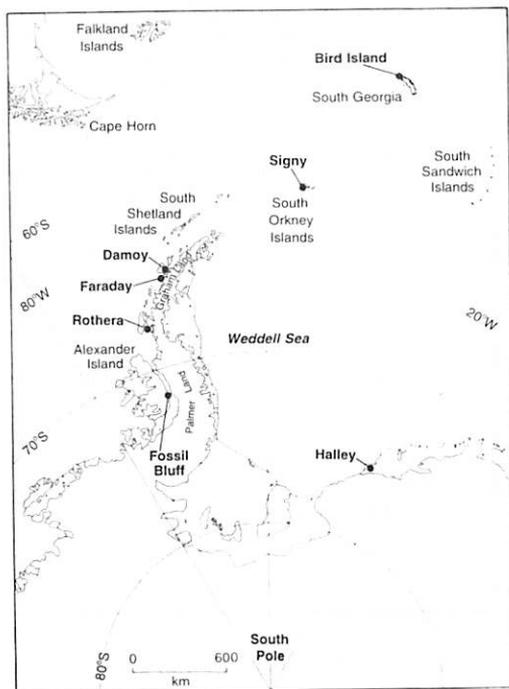


maintenance staff.

The existing boathouse will be refurbished as a powerhouse containing two mobile generators each capable of producing 60kVA and associated plant. The existing power house is to be refurbished to accommodate a waste compactor and provide dry storage and freezer space.

A fully bunded fuel storage area will consist of two steel tanks designed to hold 100 cubic metres of fuel. These will be built in front of the present main building and be capable of holding all the fuel stored in the tanks.

Unused buildings and facilities are to be closed. These comprise the present main accommodation and laboratory building and Tonsberg



House, the woodstore, generator containers and the bulk fuel tank. All contents are to be removed from these buildings which will then be sealed and left in weatherproof condition.

The new facilities at Signy have been designed for ten years of operation.

All the construction work is being undertaken by a contractor to BAS. Associated plant and materials are being transported to Signy by BAS vessels. The contractor and staff are being accommodated at the station. Site demolition last summer involved four staff being on site for up to 26 days. Construction and refurbishment involves 15 staff on site for a maximum of 154 days. The total volume of cargo imported for the building programme in 1994/95 was 18 cubic metres and the estimated total 400 cubic metres in 1995/96.

By 1996/97 the redevelopment of the station will be complete and the planned science programme fully operational.

In deciding to restructure the station the British examined four alternatives. These included the rebuilding and expansion, use of other sites on the island for summer only operations, the use of existing station facilities in the Peninsula region or continued use of Signy as it was. The option chosen will increase the efficiency of BAS operations, provide new opportunities for freshwater biological research in the maritime Antarctic and allow continuation of the bird monitoring programme carried out for the Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR).

In undertaking this project, the British are complying fully with the provisions of the Protocol including subsequent audits of activities.

Adapted from the IEE, Redevelopment of Signy Research Station, Signy Island, South Orkney Islands, Antarctica; a document written Dr John Shears in 1995 and presented as XIX ATCM/INF 10 at the meeting in Seoul.

United States President Clinton's midwinter message

Greetings to the international community of scientists and support personnel wintering in Antarctica on this year's Midwinter's Day. Science is a limitless frontier. As we explore and extend this frontier, we increase our understanding of the world around us and improve our ability to respond to new challenges. This knowledge is a resource of inestimable value and the key to a brighter future. As a natural laboratory, Antarctica plays an important role in this process of discovery. Even before people first arrived at its icy threshold, the possibility of the continent's existence fuelled the human drive to learn. Since its discovery, many explorers have sought its remote shores, and scientists have worked to uncover the secrets of the continent's past to understand its role in the future. These investigators significantly advanced scientific understanding, opening our eyes to see Antarctica not as an isolated region but as an integral component of the global system. Extending a tradition of excellence in science and creating valuable cooperative partnerships among individuals and among nations, all of you who work in Antarctica have an exciting opportunity at hand. By conveying to others what you have learned you can help the public to understand the value of scientific research, to embrace the

principles of responsible environmental stewardship, and to help prepare people everywhere for the challenges of the Twenty-First Century.

On behalf of all Americans, I applaud you for your efforts and wish you much continued success.

Sub-Antarctic

The Marion Island cats

South of South Africa at a latitude of about 47 degrees South lie the Prince Edward and Marion Islands. Both belong to South Africa and have large populations of breeding seabirds and seals. They were utilised by sealers in the 19th century, when house mice were, inadvertently, introduced to Marion Island, the larger of the two. In 1948 a meteorological station was established on the Island and in order to control mice in the kitchen, five house cats were introduced. They were neither neutered, nor of the same sex. By 1975 there were an estimated 2,000 cats on the island and their numbers were increasing at an estimated rate of 23 percent a year. Also in 1975 the cats were estimated to have consumed almost half a million burrowing petrels, and they now posed a serious threat to the remaining populations.

Control measures were introduced in 1977 but, although the numbers were reduced to about 600 in 1982, the numbers and breeding success of several other bird species had decreased sharply. Populations of greatwinged and grey petrels were particularly affected. Following trials a full scale hunt was initiated in 1986 and the process later augmented with trapping. The last cats were trapped in July 1991 and with no sightings since then, it is believed that they are now eradicated. The breeding success of the threatened greatwinged

petrels has already improved with no chick mortality since 1990.

Adapted from Challenges and Achievements, marine and Antarctic Conservation in South Africa and the Summer 1994 issue of Expeditio the South African Antarctic Newsletter

Australian adventurers bring Antarctica into school classrooms

Australians Don and Margie McIntyre are now almost halfway through a year in complete isolation in Antarctica.

The couple are wintering alone near the site of Sir Douglas Mawson's hut, in Commonwealth Bay, Antarctica.

No one has wintered at Cape Denison since Mawson was there from 1911 to 1913.

The McIntyre's expedition - Icebound 1995 - began in December 1994 with the departure from Sydney of two 15 metre yachts. The couple has set up their base in a 2.4 metre by 3.6 metre high tech survival hut. Power comes from four 32 watt solar panels and two high speed wind turbine generators which supplement a 4 HP air-cooled kerosene motor turning an 80 amp alternator to charge three dryfit 90 amp

12 bolt gelt batteries.

The engine-driven generator system is being operated in a completely sealed fibreglass enclosure so no fuel oils escape. During the year the McIntyres are undertaking scientific experiments, and filming, writing and communicating about the experience of living in extreme conditions.

A unique feature of the expedition is that schools throughout New Zealand are linking up with Don and Margie using fax, audioconference and electronic mail.

Twenty-four hour communications are being maintained with the expedition headquarters in Sydney using the Inmarsat Standard C satellite. A small blizzard proof aerial is mounted on the hut roof and a satellite photo facsimile system is used to transmit colour photographs from the hut to the media. A back-up high frequency single side band radio and Ham radio have also been set up. Marine VHF and UHF hand held radios are being use onshore for mobile communications.

Don and Margie are sending regular weekly bulletins to students, whose schools have registered with the expedition. As well as general news about how things are going, the bulletins cover topics such as preparing for the journey to the ice, the seasons, and daylight, weather, flora and fauna, under the ice, geology and geography, migration of animals, tourism and private expeditions and the social effects on people who winter-over.

Thirty-five audioconferences are being held throughout the year, each for about 20 minutes. Up to 50 schools are being chosen to take part in each session. A different five or six schools ask questions, while the others listen in. Telecom New Zealand, through its Telecom Education Foundation, has been coordinating the communications and education aspects.

Students were asked to compose a short wake up call for the couple for the morning after the Longest Night, 21 June.

Margie and Don's scientific programme is dependent on weather, but they planned to focus on monitoring the environmental effects of Antarctic cruise ships, observing birds, whales and seals, taking a census of the local Adelie penguin colonies, collecting data to establish links between nutrients from feeding and nesting birds and the presence of lichens and regular tracking of the movements of the South Magnetic pole.

Greenpeace concludes ninth expedition

Greenpeace concluded its ninth programme of activities in Antarctica this last season with visits to ten bases in the Antarctic Peninsula area, observation and peaceful obstruction of Japanese whaling activities in the north of the Ross Sea and a programme of scientific research focusing partly on whales.

For its expedition the organisation used *MV Greenpeace*, a 58 metre ocean tug registered in the Netherlands. The ship's hull was strengthened in 1985. She made trips to the Ross Sea region in 1985/86, 1986/87, 1987/88 and 1992/93 some of which supported the installation, resupply and subsequent removal of the organisation's base at Cape Evans. She spent further time in Antarctic waters in the 1991/92 and 1992/93.

Last season she was skippered by Arne Sorenson. The first mate was Andy Troia and the expedition leader Kieran Mulvaney. Ricardo Roura was responsible for the shore work and acted as environmental officer. Scientific re-

search was carried out by Elizabeth Carr, Dr Roger Grace, Chris Pierpoint and Lic. Ricardo Roura supported by the crew who came from 11 nations. All up there were 27 on board the vessel for the expedition. Roger Grace and Dave Flett photographed the expedition's activities for Greenpeace in London and Renato Castelli, an independent journalist from Las Ultimas Noticias in Santiago, accompanied members on base inspections.

The expedition departed from Ushuaia in Argentina on 28 December 1984 and concluded in Hobart on 17 March 1995.

Between December 31 and January 7 she visited eight stations on King George Island and two on the continent. They included Ferraz (Brazil), Arctowski (Poland) and Machu Picchu (Peru) in Admiralty Bay, King Sejong (South Korea), Jubany (Argentina) Frei (Chile), Great Wall (China) and Bellingshausen (Russia) in Maxwell Bay, Almirante Brown (Argentina) and Gonzalez Videla (Chile) in Paradise Harbour.

Inspections

During the visits, expedition personnel focused specifically, but not exclusively, on the implementation of the Madrid Protocol. (See *Antarctic* Vol 13, 11 September 1995). Other issues affecting the Antarctic environment but not contained in the Madrid Protocol were also observed and documented. According to the expedition's official report, Greenpeace found, overall, that over the three years since the signing of the Madrid Protocol on Environmental Protection, countries with Antarctic bases are continuing to violate the provisions, and many people working on the continent were unaware of the protocol's requirements.

Greenpeace perceives the Environ-

mental Impact Assessment requirements and procedures as the cornerstone of the Madrid Protocol, but they consider them to be among the aspects that are least understood at base commander level and the least followed overall. Most officers in charge of the bases were either unfamiliar with the concept or unaware of any EIA's carried out at their stations, despite, most having been expanded during the past few years. The exceptions were Almirante Brown, Commandante Ferraz and Jubany.

They reported international scientific cooperation at Arctowski and at Jubany where the Germans added an annex in 1992/93. Several stations had logistic cooperation with the Chilean Base Presidente Eduardo Frei Montalva where there is a hard rock airstrip which the Chilean authorities consider enhances their territorial claim in the area.

Fuel spills

The organisation claims that terrestrial fuel spills are still one of the most common features of Antarctic stations. Greenpeace inspections paid particular attention to the SCALOP (Standing Committee on Antarctic Logistics and Operators) recommendations for the prevention of fuel spills. These include technical advice on spillage prevention, containment and detection. In all, reports the organisation, these recommendations were followed to some degree at Jubany, Ferraz and King Sejong but largely ignored at the other bases it visited.

During previous visits severe spillage was observed at Bellingshausen and Frei and to a lesser extent at Ferraz and Great Wall. A recent spill was reported at Jubany. Fuel systems at Bellingshausen, Frei and Great Wall were, in general, not in very good condition.

Few of the stations had clearly defined fuel spill contingency plans. Only Jubany and Ferraz had containment under fuel tanks or spare fuel storage space. There was no use of clean energy systems at any of the bases they visited. At Frei, Greenpeace was informed that one of the buildings was going to be provided with a wind generator.

Flora and fauna

In terms of flora, fauna and protected areas, Greenpeace described the most significant damage to flora and fauna in the area of the Great Wall, Bellingshausen and Frei. Management plans for protected areas were followed to a large extent at Arctowski and Jubany which are located close to SSSI No. 8 (Western Shore of Admiralty Bay) and SSSI No. 13 (Potter Peninsula). Ferraz and King Sejong had permitting systems to protect local flora and fauna and both had specific "no-go" areas. Ardley Island's management plans were reportedly being ignored by Frei and Great Wall, with the exception of the requirement to avoid overflying Ardley Island, a requirement respected by Chilean aircraft.

Waste management practices were also observed. At most of the bases visited there was evidence of waste being removed to the country of origin or other destinations such as Punta Arena in Chile or Ushuaia in Argentina. The report states that "the removal of waste from Antarctica, though not as complete as required, seems to be the most notable (and often the only) change in procedures to comply with the Madrid Protocol. As a consequence, most bases do not dump waste any more on land or at sea. The exception was Bellingshausen where little removal of waste has taken place over the years.

Arctowski and Great Wall reported problems in removing their waste with

each having considerable backlog of several years waiting removal, both however expected to solve their problems in the near future.

While some waste was being removed from Antarctica, there was considerable reliance on incineration or open burning. In addition, it was obvious to the expedition that waste separation systems were not as effective as would be desirable. In consequence, there were instances of small (or in some case, large) quantities of waste being burnt of a type which the Protocol requires should not be incinerated. Violations were observed at Arctowski, Bellingshausen, Frei and Great Wall. Several stations were still pouring raw sewage into the sea but the only violation of the Protocol was documented at Jubany.

Arctowski and Ferraz, both in Admiralty Bay, are common destinations for tourist ships. At Arctowski it was reported to Greenpeace, that compared to previous years, the trend seems to be for more ships each, however, carrying fewer tourists.

The science programme

Three of the five projects which made up the science programme focused on whales. They included visual surveys, acoustic studies and photo identification of cetaceans. In addition, a survey of natural and human-made floating debris and a study of the effect of UV exposure on phytoplankton pigment composition in the Southern Ocean were undertaken. The programmes were conducted during the ship's transit from Ushuaia, Argentina to the Antarctic Peninsula; in the Gerlache Strait area in the Peninsula, during the transit from the Peninsula to the Ross Sea region and from the Ross Sea to Hobart. In addition opportunistic studies were undertaken during the whaling campaign

in the Ross Sea area which took the expedition as far south as the fast ice in McMurdo Sound.

The expedition report states that they continued previous work done by their Antarctic Expeditions in the summers of 1990/91 and 1992/93 in which humpback whales were photographed for identification purposes in the Antarctica Peninsula area. The purpose was to obtain photographs of the unique physical features that allow repeated identification of individual whales. This year, the project was expanded to include sperm whales and orcas, among other species.

The transects carried out in the Antarctic Peninsula during previous trips were repeated whenever possible. Photographs were taken from an inflatable when the time and weather conditions allowed, or from the deck or bridge. Useable photographs are to be sent to the Humpback Whale Catalogue, being compiled at the College of the Atlantic, Bar Harbour, where they will be reviewed and compared to the existing collection to determine if any show re-sightings of the same individual.

Acoustic studies aimed to record the number, frequency and intensity of whale vocalisations to assess the possible value of future acoustic surveys.

Efforts were made to detect and record whale sounds from a wide range of frequencies and, in particular, to identify individual sperm whales. The team members used hydrophones in the 10 to 100 kilohertz range and recorded the output. Because of the size of *MV Greenpeace* the surveys were carried out from an inflatable operated to low speed to reduce interference or using static deployment techniques. Only occasionally, when the *Greenpeace*, was drifting at 2-3 knots was the hydrophone towed behind. The experiment also used free floating sonabuys which were de-

ployed from an inflatable and monitored from the ship's radio room.

Preliminary results from this programme comprised recordings of humpback whales in the Antarctic Peninsula, and sperm whales and orcas in the Ross Sea and McMurdo Sound. The equipment has now been tried under different conditions both in sheltered waters and in the open sea and the feasibility of obtaining whale sounds from both the ship and the inflatables was demonstrated.

As part of the visual observation programme, all encounters with whales throughout the entire voyage of approximately 13,000 nautical miles were logged. The records included identification of species as well as behavioural and environmental data. The observations were made constantly during the normal bridge watch but when whales were more abundant, personnel free and conditions good, extra observers were sited on the bridge wings or monkey island.

The survey of natural and human-made debris was a continuation of the work carried out in the Indian Ocean Whale Sanctuary from the *SV Rainbow Warrior* in 1994. General Observations were made of all floating debris throughout the trip by the ship's watch and detailed observations were made every day for one hour from the bridge wings or the ship's bow depending on the weather conditions. A fine-mesh net (1 mm) was also towed once a day for an hour from the leeward side of the ship. Three detailed observations were made each day while crossing the Antarctic convergence.

The study of the effects of UV exposure on phytoplankton pigment composition in the Southern Ocean was carried out across a range of latitudes and longitudes in both Antarctic and sub-Antarctic waters. Samples of

phytoplankton and zooplankton were collected using standard 55 micron and 250 micron nets and filtered through glass fibre filters and preserved for pigment analysis. Profiles of temperature and salinity (up to a depths of 25 metres) were taken at each station, along with estimates of UV penetration through the water column. Surface incident UV-B and photosynthetically active radiation (PAR) were measured hourly all along the cruise track, and at all sample stations.

Overall a total of 31 stations covered the wide range of latitudes between Terra del Fuego and the Antarctic Peninsula and between the Ross Sea

and Tasmania and longitudes from the Peninsula to the Ross Sea. Two of the stations in the Ross Sea were sampled three times at intervals of approximately one week. In 23 stations sampling was undertaken from inflatables.

All the samples and data have been forwarded to the Exeter Lab, Department of Earth Sciences, University of Exeter in the UK and results will be published in due course.

The third component of the voyage comprised anti-whaling activities along the theme of highlighting support for the Southern Ocean Whale Sanctuary. (See pages -401ff of this issue of *Antarctic*).

An Antarctic Centenary

Bob Headland, Archivist at Scott Polar Institute, Cambridge

Of the various commemorations which are becoming timely one is the centenary of the International Geographical Congress which met in London. The series of congresses had begun in Antwerp in 1871 and progressed to various cities where a geographic society was established. In London the sixth of these was organised by the Royal Geographical Society and held in the Imperial Institute with the "delegates of Foreign and Colonial Governments and Geographical Societies who were presented by the Ambassadors, Ministers, or Diplomatic Agents' from 50 states attending. It began on 26 July and finished, with a General Meeting on 3 August 1895 in the Great Hall of the Institute. Many countries involved also exhibited maps and other items of geographical interest in the two large gal-

leries adjacent. On the last day the first decision was that the seventh congress would be held in Berlin in 1899, then a series of 21 resolutions were presented to the Congress for consideration. The first four of these, which had previously been adopted by the General Meeting, were read: number three was *That this congress record its opinion that the*



exploration of the Antarctic Regions is the greatest piece of geographical exploration still to be undertaken. That in view of the additions to knowledge in almost every branch of science which would result from such a scientific exploration the Congress redo recommends that the scientific societies throughout the world should urge in whatever way seems to them most effective, that this work should be undertaken before the close of the century'. The resolution had been drafted on 29 July by the Committee on Polar Exploration and had been presented to the General Meeting on 1 August by Professor Karl von der Steinen (a member of the German International Polar Year expedition on South Georgia, 1882-83). It was carried unanimously on 1 August.

Several Antarctic voyages had immediately preceded this and had, in practice, introduced the Heroic Age of Antarctic exploration. These were: the two Norwegian whaling reconnaissances from Sandefjord of Captain Carl Anton aboard *Jason* (1882-93 and 1893-94), the second being accompanied by Morten Pedersen (aboard *Castor*) and Carl Julius Evensen (*Hertha*); the similar voyage from Tonsberg in 1883-95 led by Henrik Johan Bull (aboard *Antarctic* commanded by Leonard Kristensen); and a British whaling expedition (1892-93, the Scottish whalers from Dundee) of Alexander Fairweather (*Balaena*), Thomas Robertson (*Active*), Robert Davis Davidson (*Diana*) and James Davidson (*Polar Star*). It was this conference that stimulated international interest in the subject. At the end of their preface the two Congress Secretaries noted it has been made incumbent on this officials to take steps to see that the resolutions passed by the congress are as far as practicable carried into effect, so they may not, as has been too frequently the case in the past, re-

main a dead letter (Keltie and Mill, 1896).

The resolution, with the encouragement of the Secretaries note, was a dominant factor in encouraging the subsequent epoch of Antarctic continental exploration which came to an end largely because of the First World War. Antarctic winter expeditions were despatched from Australia and New Zealand, Argentina, Belgium, Britain, France, Germany, Norway and Sweden during this notable historical period. Summer expeditions were also despatched from these and several other countries. Two other historical events during it were the establishment of permanent occupation of the South Orkney Islands (from 1 April 1903 by the Scottish National Antarctic Expedition) and South Georgia (Nob November 1904 by Norwegian whalers). The attainment of the South Pole twice was the most well known achievement of the period.

The International Geographical Congress resolutions adopted on 3 August 1895 covered many topics and concerned most parts of the world. Number three of these resolutions was notable in that it set continuing precedents for international cooperation in geographical and scientific exploration of Antarctica.

Keltie, J.S. and Mill, H.R., *1896 Report of the Sixth International Geographical Congress*. London, John Murray.

Editor retires

After ten years as editor of *Antarctic* Robin Ormerod has retired, effective September 1, to pursue other interests. She would like to thank particularly those representatives from the different national Antarctic organisations as well as the non-government and independent groups who have helped with the provision of information on which the bullet-

in is so dependent. A new editor will be appointed at the forthcoming meeting of the National Council of the Society scheduled for September 2 and 3.

Hopefully the good relationships that have been built up over the last few years can be continued. They have been much appreciated.

Memorial service at Shackleton's grave

On 10 March 1995, Society member Mr Arthur Helm of Wellington, joined members of the crew and passengers from *MV Explorer* in a short wreath laying service at Shackleton's grave at Grytvikken in South Georgia to commemorate the explorer's life.

Earlier this year, when the opportunity arose for Arthur Helm to cruise aboard *MV Explorer* to the Antarctic, he noted that the itinerary included Grytvikken, South Georgia and resolved to join the ship. Mr Helm has had a lifelong interest in the continent, was deeply involved in many aspects of the organisation of the New Zealand component of the Commonwealth Trans-Antarctic Expedition of 1955 to 1957 and holds Sir Ernest Shackleton in the highest regard. To fund the trip Mr Helm sold many of the best books in his

Antarctic collection and some stamps. He then conceived the idea for the service and approached the Society for suitable wreath - it had to fit in his suitcase!

The simple service comprising a prayer, written for the occasion by Peter Graham, Cruise Director who also read "Let us thank God for men of Greatness. May their achievements and memories live in our hearts and may the gesture here given by friends and admirers be a part of eternal life, that in turn we may all share and be proud that

Peter Graham, Cruise Director, reads a short prayer during the service held for Shackleton at Grytvikken in South Georgia. He is accompanied by Arthur Helm and expedition director Matt Drennan who stands on the right.



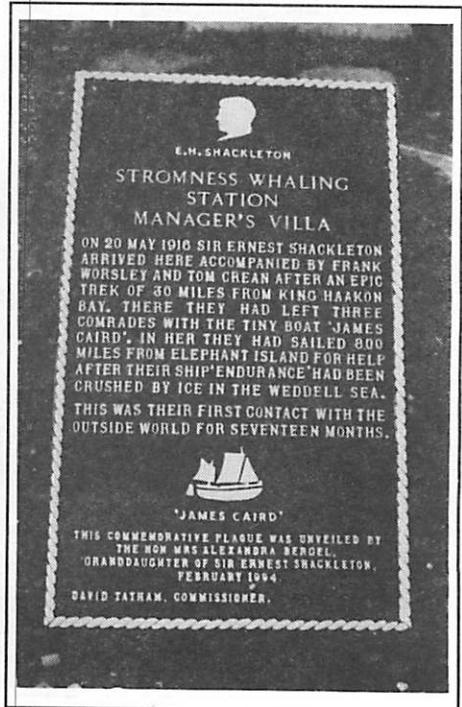
in our own humble way we came to pay our respects and gratitude to one who helped educate and make the world a better place. Arthur Helm then gave a short address before laying the wreath and the service concluded with the reading of the 23rd Psalm, Shackleton's favourite, by Matt Drennan, expedition leader. The wreath of red poppies carried the inscription "Sir Ernest Shackleton: In memory of a gallant explorer and his Antarctic comrades." *The New Zealand Antarctic Society March 1995*. Initially it was intended to leave it on the grave but when Mr Helm learned of the fierce storms and the six feet of snow that lay in the vicinity during the winter he entrusted it to the care of Mr and Mrs Carr, the curator of the whaling museum at Grytviken and his wife.

The *MV Explorer* was formerly the *Linblad Explorer*. This voyage, which began at Port Stanley, comprised visits to the South East Falkland Islands, South Georgia, Gough Island, Tristan da Cunha, Nightingale Island, St. Helena, Ascension Island, Cape Verde Island, the Canary Islands. At Grytvikken the ship anchored a short distance offshore and the passengers were transferred to the island by zodiac in several contingents after which they walked to a small hill where the cemetery is situated.

During the previous evening, on board the ship, Arthur Helm had spoken about the men who had been with Shackleton and who were associated with New Zealand. Commodore Frank Worsley D.S.O., O.B.E. R.D, R.N.R, was born in Akaroa on Banks Peninsula in 1872 and was captain of the *Endurance* in 1914-16. After the rescue of the party from Elephant Island he served with distinction on the "Q" ships operating against German submarines in the First World War and later as hydrographer and sailing master of the *Quest* in 1921-22. on the *Island* with

the British Arctic Expedition 1925, and in trading vessels until 1939. He served in World War II until his death in 1943.

Harry McNeish, the Scots carpenter, returned to the Mercantile marine for a few years after the expedition and eventually worked his way to New Zealand on the *Ruapehu*. For a time he worked in Wellington for the New Zealand shipping company but an accident and severe rheumatism brought an end to this and he had not been in the country long enough to qualify for a pension. McNeish lived his last years in the Ohiro Bay Old People's Home and died in September 1930 having been supported by donations from the watersiders who held him in high regard. He was buried in Karori Cemetery with full military honours; the flag used during the service formerly flew over Scott Base. His expedition diary is in the Alexander Turnbull library.



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