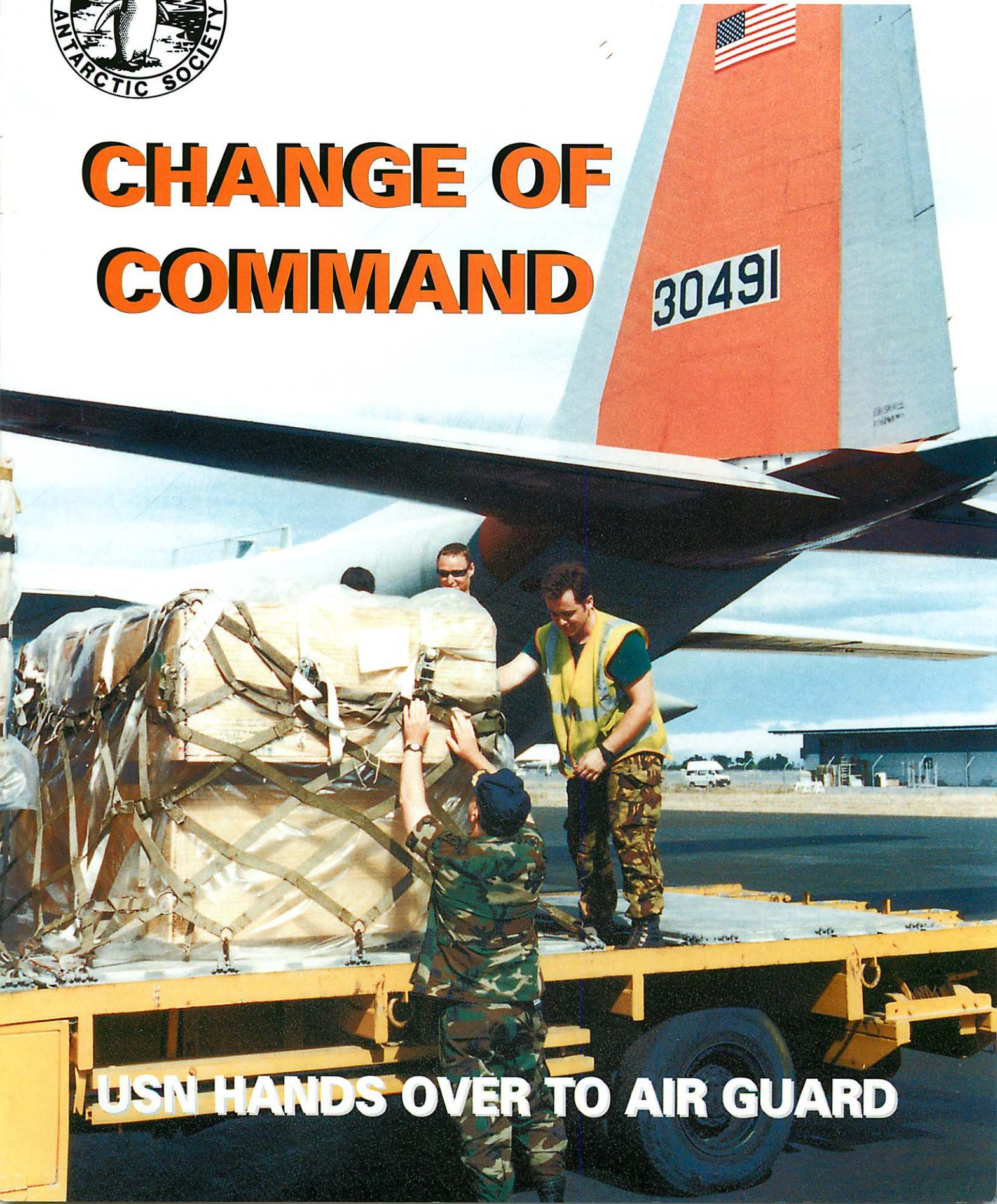


ANTARCTIC



The Journal of the New Zealand Antarctic Society Vol 15. No. 4, 1998

CHANGE OF COMMAND



USN HANDS OVER TO AIR GUARD

US NAVY BIDS FAREWELL TO OPERATION DEEP FREEZE

See story on page 76



*New Zealand Party before flight from McMurdo to Hallet, 1957-58.
Photo courtesy of Antarctica New Zealand Library*



*McMurdo Station, 1991-92.
Photo courtesy of Antarctica New Zealand Library*



LC-130s line up on the ice runway.



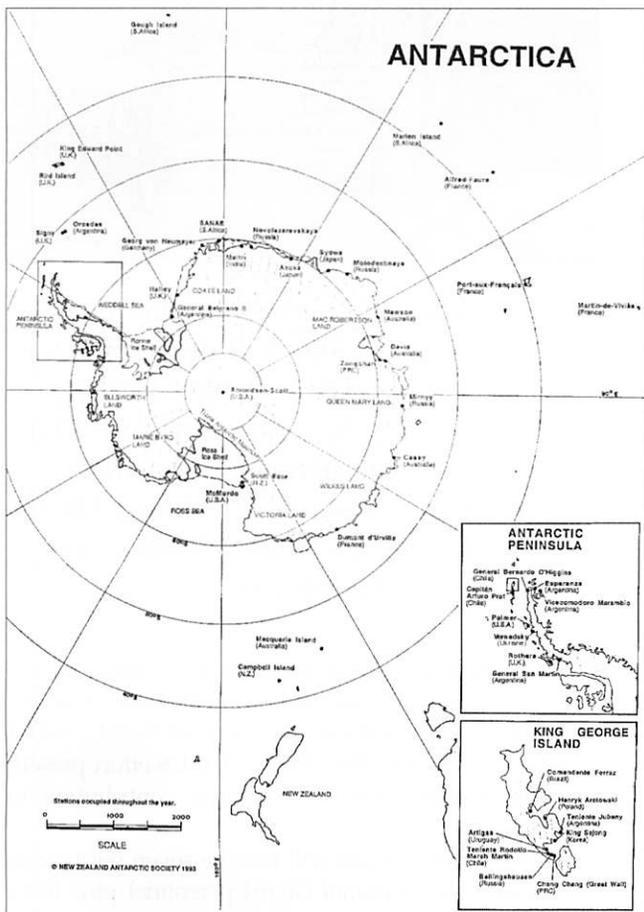
*US aircraft landing at New Zealand field camp, Victoria Land Mountains. 1961-62.
Photo courtesy of Antarctica New Zealand Library*



Cover: Loading an LC-130 at Christchurch for a flight to Antarctica

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FORTHCOMING EVENTS

28-30 April, 1998 — Antarctic Futures Workshop, St Andrews College, Christchurch NZ. The workshop aims to examine the trends likely to shape Antarctic activities over the next few decades and the opportunities these may provide for New Zealand. Organisers: Antarctica New Zealand.

14-16 May 1998 — Belgica Centennial Symposium, Brussels, Belgium. The Belgica Centennial Symposium will be held in Brussels (14-16 May 1998) under the High Patronage of His Majesty the King Albert II, to commemorate the 100th anniversary of Gerlache's 1897-1899 Belgica expedition.

25 May- 5 June, 1998 — XXII ATCM, Tromso, Norway

INTERNATIONAL SYMPOSIUM

The Antarctic Heritage Trust plans to stage an International Symposium in Christchurch on polar heritage protection issues this year. It will involve groups interested in any aspect of preserving historic sites and will be open to individuals and organisations. Contact the executive officer, at the International Antarctic Centre, Orchard Road, Private Bag 4745, Christchurch, New Zealand. Phone + 64 3 358 0200, Fax + 64 3 358 0211.

US NAVY BIDS FAREWELL TO OPERATION DEEP FREEZE

By Shelley Grell

Leaving a legacy of Antarctic logistical support, the Christchurch New Zealand based Naval Antarctic Support Unit (NASU) and the Naval Support Force Antarctica (NSFA) are disestablishing 31 March 1998. The Navy aviation group Antarctic Development Squadron 6 (VXE-6) will remain in the US Antarctic Program for one more season and then disestablish in March 1999.

The changes are part of a shift in America's Department of Defence that will task a single military unit — the New York Air National Guard — to fly all LC-130 (ski-equipped) Hercules aircraft, which operate in both the Arctic and the Antarctic.

The US National Science Foundation will continue to fund the entire US Antarctic Program, which has three main parts: research projects from universities and other Federal agencies, operational support by the contractor Antarctic Support Associates and other firms, and the military logistics units.

Since 1955, when Operation Deep Freeze began as part of the US contribution to the 1957-1958 IGY, the US Navy had provided logistics for Antarctic research. This involved the operation, maintenance and transport of cargo and personnel to and from the staging base at Christchurch International Airport and Antarctica. It also entailed the operation of messing, berthing, medical, postal, supply, disbursing, cargo handling, personnel services, aircraft support and terminal facilities. Shared research and research support with other nations was frequent, and the US and New Zealand programs were and are particularly cooperative because of a shared station (Hallett) and the nearness in Antarctica of McMurdo and Scott Base.

A combination of defence and operational savings, March 1998 will mark an end to the Navy's 43 year involvement with Operation Deep Freeze. The decision was initiated by the US Navy, supported by the National Science Foundation (NSF) and the mission was accepted by the US Air Force and the New York Air National Guard. Responsibilities will be assigned to the New York Air National Guard and NSF contractor Antarctic Support Associates (ASA).

ASA anticipates hiring up to twenty local New Zealand personnel for a mixture of contract and full time positions transitioned from the US Navy. As the prime operations and maintenance support provider for the Christchurch operation, ASA will outsource a number of services, to include: in-flight meals, fuel, janitorial and custodial, waste management, hazardous waste disposal, stevedoring and hotel accommodations.

While the transition may indeed allow the Navy to meet obligations elsewhere and to "focus on their primary role", says NSF Systems Manager Dave Bresnahan, the net anticipated savings for the NSF is estimated at US\$44m and a reduction of 268 full time staff between 1998 and 2002. This figure also includes other areas identified for cost saving.

These are significant savings considering last year's budget for the (NSF) US Antarctic Programme was US\$193.5m, US\$122m of which was spent on logistics and operations because of working in such a remote location. Grants to scientists made up US\$30.5m and direct



"I am hopeful that Antarctica in its symbolic robe of white will shine forth as a continent of peace as nations working together there in the course of science set an example of international cooperation."
Richard Evelyn Byrd, Rear Admiral United States Navy, 25 October, 1888 — 11 March, 1957.

field support amounted to US\$41m. Although the changeover in command represents the end of an era, Bresnahan confirmed the departure of NASU, NSFA and VXE-6 will not affect the level of US effort present in New Zealand nor the economic contribution to Christchurch.

In Christchurch there will now be seven permanent year round Air National Guard personnel plus three



US Navy aircraft landing in Antarctica. Photo courtesy of the Hatherton Collection

additional US military staff. And while 60 Navy personnel arrived for the entire summer season, the ANG will be boosted by a further 12 seasonal people plus 40-60 in Christchurch in the pipeline rotating to and from McMurdo base. "We want the transition to be as seamless as possible," he said. "People will see changes in uniforms but they will also see a large, though more varied, group of US personnel."

Since 1988 the New York Air National Guard has operated LC-130 ski-equipped Hercules aeroplanes to supplement LC-130 operations by Antarctic Development Squadron 6 (VXE-6) of the US Navy. Beginning in the 1999-2000 austral summer, the Air National Guard will be responsible for all US LC-130 Hercules flying in Antarctica and between Christchurch and Antarctica. VXE-6 will complete its last season of Antarctic flying during the 1998-1999 austral summer and will be decommissioned in 1999.

The seven personnel from the Air National Guard permanently assigned to Christchurch will form Air National Guard Detachment 13 (ANG DET 13). This detachment will be responsible for all deployed Department of Defence support elements in Christchurch and will oversee all activities related to aircraft, flight line and ramp operations for USAP aircraft and the weekly C-141 Starlifter AMC CHANNEL missions to New Zealand.

In addition to the closing of the

Navy facilities south of Memorial Avenue in Christchurch, the buildings previously leased by the National Science Foundation will be returned to Christchurch International Airport to use for future airport expansion.

The next few years will be busy for US personnel. As well as the usual activities, the current Amundson-Scott South Pole Station, in use since 1975, will undergo replacement. With an intended lifespan of just 15 years, a

NASU'S COMMANDING OFFICERS

Operation Deep Freeze

19 July 1955 to 14 April 1959	RADM George J. Dufek
14 April 1959 to 26 November 1962	RADM David M. Tyree

Advance Headquarters Group Christchurch (Det One)

1962-1966	CDR W.G. Withrow
1966-1970	CDR Lauren M. Johnson
1970-1972	CDR Elvin G. Lightsey

Christchurch Staging Base Group (Det Delta)

1972-1974	CDR Robert G. Davis
1974-1978	CDR Robert L. Moss
1978-1979	CDR R.L. Chrans

U.S. Naval Support Force Antarctica Detachment Christchurch

1979 to 31 August 1981	CDR R.L. Chrans
31 August 1981 to 30 June 1986	CDR Wayne A. Jones
30 June 1986 to 8 September 1989	CDR Robert M. Harler
8 September 1989 to 1 October 1990	CDR J. Brian White

U.S. Naval Antarctic Support Unit Christchurch

1 October 1990 to 26 July 1991	CDR J. Brian White
26 July 1991 to 12 August 1994	CDR James P. McAllister
12 August 1994 to 3 July 1996	CDR Michael Kennedy
3 July 1996 to 31 March 1998	CDR John W. Stotz

new station is long overdue. Completion of the first phase is expected by 2005. "It'll be a more efficient station to operate," said Bresnahan, "accommodating 110 personnel in summer and 50 in winter."

"We will also continue to be actively involved with local community projects including the Special Olympics, Camp Quality, Cholmondley House and Toys for Tots. In fact, we recently donated playground equipment and a plaque in association with the disestablishment to the Christchurch City Council."

Right: Antarctic Support Association provides air cargo and loading services at McMurdo and South Pole Stations.



LONG MISSION FOR THE US NAVY

By Warren Head

The name may have changed several times but the mission for the United States Navy at Christchurch International Airport has been the same since Admiral George Dufek's era.

The commanding officer for the United States Naval Antarctic Support Unit, Christchurch, (NASU) heads the team that provides the logistical lifeline to the frozen continent.

NASU is the unit providing the staging area for all US Antarctic programme passengers and cargo transiting to Antarctica along with international sharing with the Italian, German, New Zealand, and Russian programmes.

NASU provides a military international airport inside one of New Zealand's major international airports. "We run an international terminal that is rather unique in New Zealand," says Cmdr John Stotz. "Outside of the flights to the USA it

has only one other destination; we comply with all of New Zealand's border requirements for customs and immigration, fly under New Zealand air traffic control and essentially do what QANTAS or Air New Zealand do except we don't fly to Fiji."

Cmdr Stotz's clients are not well-dressed for Fiji for it is at NASU that passengers south are fitted out with extreme cold weather protection apparel and briefed on polar survival procedure.

NASU is part of Operation Deep Freeze, the military operation of the US armed forces tasked by the US Naval Support Force Antarctica (NSFA) to provide logistical support for US Antarctic Programme, which the US National Science Foundation funds and manages. Other nations, particularly New Zealand Defence Forces and the New Zealand Antarctic Programme, collaborate in support of their antarctic research.

The Navy Department established NSFA in 1955 as part of the US contribution to the International Geophysical Year 1957, with its original work for Operation Deep Freeze I the establishment of various research stations.

Command of Naval Support Force Antarctica (desig-



Above: Rear Admiral George J. Dufek, Commanding Officer Operation Deep Freeze, 19/7/55 -14/4/59. Right: Official Unit Crest of US Naval Antarctic Support Unit Operation Deep Freeze.



nated Task Force 43 in the Atlantic Fleet) went to Rear Admiral George J Dufek, with Rear Admiral Richard E Byrd the honorary chair of the Antarctic Committee and officer-in-charge of the US Antarctic Programmes.

Under Dufek's command seven ships and 1800 men headed to Antarctica to establish an airfield and a base of operations at McMurdo Sound. This station dubbed McMurdo Airfield Facility was to become the logistical hub of the programme. . . and the receiving end of passengers from Christchurch.

Antarctic Development SIX (VX-6) was established and placed under Dufek's operational control to conduct flight operations for the programmes from 1955, initially flying R5D Skymasters and ski-equipped P2V Neptunes.

Those early flights, beginning on 20 December 1955, took the aircraft over thousands of square miles of some of the most remote seas on Earth. Better aircraft have taken their place but the risks are the same.

"Today we have better tools to manage the risk," says Cmdr Stotz. "But the end result is the same if something goes wrong — you've got a problem in the remotest place on the globe."

The LC-130 ski-equipped Hercules is now the work-horse aircraft of the programme and was first used on the continent by the US Air Force in 1959. VX-6 began using LC-130s from 1960 with a quadrupling of the amount of cargo that could be shifted.

Redesignated as Antarctic Development Squadron SIX (VXE-6) in 1969, the LC-130s and UH-1 'Huey' helicopters became familiar sights on the ice and at RNZAF Wigram, the base in Christchurch until the operations were moved to Christchurch International Airport in 1960.

From 1960 when Rear Admiral David Tyree took



Cmdr John Stotz, the last "Skipper" at US Naval Antarctic Support Unit, Christchurch.



LC-130 of New York Air Guard with a LC-130 of VXE-6 in background at Operation Deep Freeze in Christchurch.



CDR John Stotz with Sir Edmund Hillary, Major Paul Giovino and Lt. CDR Bob George and Lt. CDR Bob Carman in front of an LC-130 VXE-6 aircraft at Christchurch airport during 40th anniversary celebrations of Scott Base 1997.

command it has been a separate command. Tyree established the Advance Headquarters Group Christchurch in 1962. A decade later it became Christchurch Staging Base Group, in 1979 US Naval Support Force Antarctica Detachment Christchurch and from October 1990 NASU.

Over the years task has altered, in recent years to providing a range of services including communications, liaison with foreign governments, issuance of extreme cold weather gear for travellers to the ice, hotel bookings for military travellers. Additionally, NASU provided port operations management for vessels to and from Antarctica, which take all fuel and most cargo to McMurdo leaving high-priority cargo and passengers to aircraft.

NASU which is funded from the National Science Foundation to provide logistical support has become a highly efficient unit. Down from military personnel levels in the 40s at its peak to around 20, many of its earlier functions, like that of VXE-6, have been outsourced to civilian contractors.

"At the beginning the US Navy was engaged in a true expeditionary

sense, breaking new ground everywhere," says Cmdr Stotz. "Today it is a resource management role as we identify and use resources to provide efficient logistical support for science programmes."

Along the way NASU has made a major economic impact in Christchurch. "When you're anywhere from 6000 to 9000 miles from usual sources it makes economic sense to buy locally. We have spent a significant amount in Christchurch, acquiring food, housing, building materials, aircraft servicing."

"Much of the supplies go south; an LC-130 can carry 5000-6000kgs, a C-141 can average 20,000kgs."

"The Navy places emphasis on Total Quality Management and this is important with 110 intercontinental return flights, some two million pounds of cargo and around 5000 passengers a year."

"The highlight for me during my command is that it has been mishap-free despite the complex work we do loading planes, driving vehicles and operating materials handling equipment."

"One of my personal goals has been to conduct this programme without hurting anybody and we

have managed that by ensuring that our risk assessment is conducted well out in front."

For many years the early equivalents of NASU used World War 2 RNZAF barracks at Wigram then at Harewood. "We moved in on a temporary basis in the 1950s and stayed 45 years."

"It reached the point where they became too expensive to upgrade to a commercial standard and in 1991-92 the unit decided to utilise a block booking facility with local hotels."

Cmdr Stotz, a helicopter pilot, is the last US Navy commanding officer and skipper to be based at Christchurch.

The New York Air National Guard, which has flown auxiliary missions for VXE-6, will move to the primary role from March 1998, NASU and NSFA will disestablish, and VXE-6 will provide support in a reduced capacity augmenting the Guard for the 1998-99 season. VXE-6 will disestablish in 1999.

The old accommodation blocks on Memorial Avenue will revert to airport management. Cmdr Stotz will ask for the lights to be turned out in the Southern Lights Restaurant and Bar and the famous nightclub will be sold.

NEWS

ANTARCTIC WHALING RECORDS SUGGEST DECREASED SEA-ICE COVER

A climatologist from Tasmania, Australia, is using the previously untapped source of whaling records for long-term data about the behaviour of sea-ice around Antarctica.

The International Whaling Commission maintains computerised records of 1.5 million whaling catches, every whale caught by factory ships in Antarctic waters from 1931 to 1987, before commercial whaling stopped. The whalers' logbooks note the precise latitude,

longitude date and species for each catch.

The climatologist, William K. de la Mare reasoned that because whales, especially the blue whale, are known to congregate near the ice edge, the records of the catches should give a good indication of where the ice edge was on a particular day at a particular geographic point.

By combing the records and plotting what he found, de la Mare determined that the seasonal sea ice was constant

until about 1954, when it began to shrink, ultimately reducing in size by 25%. It stabilised 19 years later and has stayed about the same from 1973 to.

Climatologists believe that the mass of the Antarctic sea-ice is a crucial factor regulating global climate. Whether the variation in the position of the ice edge indicated by the whalers' records is an indication of significant and long-term climate change or simply a natural cyclical variation is unknown.

CONTRACT TO AIR NEW ZEALAND

Air New Zealand has won a \$2 million annual contract to maintain aircraft used in the United States Antarctic programme.

The five-year agreement to service the aircraft of the United States National Science Foundation and the New York Air National Guard starts in February.

The foundation representative, Bill Bryant, says the contract is an extension of work Air New Zealand was already doing but its renewal had been in doubt after the United States Navy withdrew from operational support of the Antarctic programme.

Bryant said although consideration had been given to awarding the contract outside New Zealand Air New Zealand had been the most cost-effective and best operational option.

FATALITIES ON ICE

This season has been tough for adventure tour company Adventure Networks International (ANI). Out of seven group Antarctic expeditions this season, two were marred by four fatalities.

One of the tragedies happened in December when three out of six members died during ANI's first advertised parachuting programme to the Geographic South Pole. All members were highly experienced and well qualified. Some had jumped at the North Pole, all had skydive licences and were considered very experienced within the skydiving community.

MCMURDO BREAKS 24-YEAR-OLD WEATHER

Last October was the coldest and stormiest at McMurdo Station since 1973.

Storms hit McMurdo throughout the month disrupting aircraft schedules, delaying the opening of field camps, forcing an early closing for the Cape Roberts Project drill site, demolishing a Jamesway structure on Black Island, and putting the station on "Condition One" (all movement restricted) status during summer business hours for the first time in recent memory.

Storms stranded Antarctic travellers at all points in the travel circuit. South Pole winter staff (see South Pole Station opening delayed)

were forced to remain at the station for 12 additional days before a flight carrying summer replacement staff, who were stuck at McMurdo, could reach the pole. Siple Dome personnel, scheduled to go to base camp on 28 October, were also caught by the McMurdo storms. Others on their way to Antarctica were held in Christchurch, New Zealand, until the storms abated, personnel could be moved, and bed space made available at the station.

The delays threatened the science schedule for the year, but like their counterparts at South Pole Station, managers at McMurdo are working to overcome the setback.

The ANI Twin Otter flew them to the South Pole along with a rescue guide and doctor. Almost two hours were spent on the ground with final preparations, weather checking and photographs.

All six exited the aircraft as planned at 2600m above ground level. Three members survived. The other three died when two of the parachutes failed to open and one was only partially deployed. An investigation by the Chilean authorities is currently underway and a report may be produced by May 1998.

The reason why the parachutes did not open is unclear and the company is not able to speculate. The two Americans and one Austrian who died were Ray Miller, 43 of Ohio, Steve Mulholland, 36 of Seattle, Washington and Hans Ruzec, 49, of Vienna, Austria. All further skydives planned

for this season were cancelled by ANI until the findings of the investigation are received.

The fourth death that occurred in Antarctica for Adventure Networks International this season was during a two grouped French Army Expedition. The first group skied from Patriot Hills to Vinson Massif. The second group which consisted of three members skied and summited many peaks along the Ellsworth Range, most of which were first ascents. They also climbed a new route on Mount Tyree.

On the way down to Vinson base camp one of the climbers slipped on the edge of a pass and was hit from behind by his sled. He did not fall far but knocked his head on rock and died immediately. He and all other members were returned to Chile by Adventure Networks International.

SOUTH POLE BASE TO BE REPLACED

The United States scientific research base at the South Pole is to be replaced at a cost of \$265 million.

The new station will take eight years to build and is expected to be completed by 2005. It will replace the geodesic dome-sheltered research facilities at the Amundsen-Scott South Pole Station.

A number of Christchurch companies were expected to win contracts for part of the work.

The new base will be built on stilts and will include laboratories, medical facilities, a new power plant, a water well and accommodation. It will house up to 110 people.

The first phase, costing \$44 million and including a new heavy-vehicle maintenance facility, a power plant and new storage fuel tanks has already started and will be completed by 2000.

The new station will be prefabricated and test-erected in the US before being dismantled and shipped to the McMurdo Station.

BAS DIRECTOR RETIRES

The Director of the British Antarctic Survey (BAS), Dr Barry Heywood, retired last September after 36 years. Dr Heywood joined the Survey as a zoologist in 1961 when it was still the Falkland Island Dependencies Survey. His early research was in the field of freshwater science for which he was awarded the Polar Medal in 1967.

He was a key figure in the development of the successful Offshore Biological Programme which looked at the Southern Ocean ecosystem and the importance of krill to the food web. He was awarded a second Polar Medal in 1986.

After 26 years with BAS he was appointed head of marine life sciences and he became deputy director in 1988 and director in 1994.

He has been succeeded by Professor Chris Rapley, who was previously the executive director of the International Geosphere-Biosphere Programme (IGBP) in Stockholm. The IGBP is a research programme dedicated to understanding global change.

INTERNET NEWS

US ANTARCTIC PROGRAMME ON THE NET

If you are looking for information about the National Science Foundation and the United States Antarctic programme — almost any information you could possibly think of — then look at their Internet site. It is filled with current news, reviews, articles, journals, references, images, science projects, highlights, awards and observations.

One excellent source of information, that also includes links to other pages and sites, is the new electronic form of the long-standing 'Antarctic Journal' published by the Office of Polar Programs, National Science Foundation in Virginia, USA.

The National Science Foundation has also modernised its news service by providing a new information delivery system called Custom News service through its web site. Custom News is a web-based and e-mail-based system that automatically alerts those interested, via e-mail, about new NSF publications and information. Once you have detailed which information you are interested in, Custom News will then regularly inform you of new publications and provide links to electronic copies that can be downloaded or printed. It also

delivers the full text of news materials such as press releases, tipsheets and advisories.

To subscribe to this free service, you need an Internet e-mail account. (Your e-mail address is used as your log-in I.D.) Go to <http://www.nsf.gov>. Click on the Custom News button on the toolbar at the bottom of the home page. After providing your Internet e-mail address, you will be prompted to create a profile of NSF publications you want to know about or receive.

HERITAGE ANTARCTICA WEB SITE

With the Internet becoming an increasingly popular source of information and research, the Antarctic Heritage Trust and UKAHT are planning to establish their own domain under the Heritage Antarctica banner.

AHT will begin with a comprehensive section including information about the organisation, the conservation programme and the historic sites in the Ross Sea region, while the UKAHT is also developing an extensive and informative overview of its work.

Professor Rapley also holds a chair in remote sensing science in the Department of Space and Climate Physics, at University College in London.

SIGNIFICANT FINDS AT CAPE ROBERTS

Significant finds were made in the Cape Roberts Project, according to the initial science report.

Unusual microfossil biota were found in the 150 metre deep hole, including some ancestors of poisonous marine algal blooms existing today.

Other microfossils helped palaeontologists to date the cored strata. It was younger than expected at 17-22 million years old and showed signs of at least eight periods of glacial advance and retreat, when the climate was much warmer than it is today.

The beginning of the current period of McMurdo volcanism shows up at about 19 million years ago.

Another significant find was a thick layer of Quaternary sediments, including shell debris about 32-33 metres below the sea floor which suggests a 'superwarm' period, with no sea ice, between one and two million years ago.

JAPAN SLAUGHTERS MINKE WHALES

Japan's Antarctic whaling fleet took 440 minke whales back to Japan when they left the Southern Ocean last March, according to the newsletter, *The Antarctica Project*.

The Japanese programme intended to sell 1995 tonnes of meat — 150 tonnes more than the previous year — to processors of canned foods, schools and for general consumption.

Japan justifies whaling in the Southern Ocean as essential to scientific research, the newsletter says. "However many experts have argued that

killing whales is not necessary since information that is acquired is either not new or can be gained by non-lethal means.

"At the recent IWC meeting the Commission passed its strongest resolution to date that was highly critical of Japanese research whaling in the Antarctic.

"In spite of this resolution Japan is working hard to reach its long term goal of elimination of the Southern Ocean Whale Sanctuary and resuming large scale factory whaling."

PROTOCOL PROTECTION TREATY RATIFIED

The ratification of the Protocol on Environmental Protection to the Antarctic Treaty took place on 14 January, 1998.

Treaty nations had been waiting for Japan, the last country to ratify the protocol, to advise of its acceptance. In New Zealand the protocol had been incorporated into law through the Antarctic (Environmental Protection) Act.

Although parts of the act became law in February 1995 enforcement of most of the provisions were awaiting international ratification of the protocol.

New measures to be enforced next year cover the areas of permits and environmental impact assessments. Penalties for offences will also be increased, including fines of up to \$200,000.

REVIEW

GREAT SCOTT! — THE MUSICAL



Great Scott! being performed in the Great Hall of Parliament House, Canberra, October 1997.

The idea for this musical originated in 1958 when David Burke, Australian journalist and author of several Antarctic books, including *Moments of Terror*, the story of Antarctic Aviation, was covering the Trans-Antarctic Expedition from Ross Island.

After visiting both of Scott's Discovery and Cape Evans huts and climbing Observation Hill to gaze south across the silent Ice Barrier, Scott's presence seemed very real. Burke imagined the five men trudging through the snow, man-hauling their heavy sledges, breaking the mind-sapping monotony by singing their favourite songs — Onward Christian Soldiers and Ta-Ra-Ra-Boom-Deeay. He even thought he could hear a faint echo of their voices coming to him across the ice.

This fancy grew quietly in his mind for many years, before last year resulting in the major performance of an Antarctic first — the musical *Great Scott!* — before the Australian Governor General.

The musical takes the form of a cantata featuring a narration interspersed with songs and dramatised episodes that describe aspects of Captain Scott's tragic 1911-13 expedition. David Burke wrote the words, and the music was composed by David Jensen, music master of King's School, Parramatta, Sydney, which both Frank Debenham and Griffith Taylor had attended.

Debenham, the first Australian scientist-explorer to visit Antarctica as part of Scott's expedition, is "narrator." The musical's first trial performance was held at King's School with a choir of 90 young voices, but the first "official" premiere performances were held 11-12 October, 1997, in Bowral, Australia, the place of Debenham's birth.

Led by the 20 adult voices of the Berrima Singers, the performances were held during the "Tulip Time" Festival in the Anglican church of St Simon and St Jude next to the Rectory where Debenham was born and where his father, Rev. John Debenham, had been minister. The third, and most significant performance was in the Great Hall of Parliament House, Canberra, with a choir of 160 voices, 80 of them from King's School, in aid of an AAP appeal for the restoration of Mawson's Antarctic Huts.

The Australian Government presented a cheque for \$250,000 to the Mawson's Huts Appeal.

Jack Ward, in a review for *Aurora*, wrote of the performance:

"It is amusing, moving, respectful and irreverent, with good melodies and cleverly contrasting narration across a background of seldom-seen archival photographs projected on a large screen behind the singers and speakers. The whole production is ultimately original, fully professional and absorbing, as well as entertaining."

NATIONAL PROGRAMMES



NEW ZEALAND

HALLETT VS ROSS PENGUIN STUDY

This season scientists from Cambridge University, UK, Otago University, NZ and Macquarie University, Australia together with Christian Perez of Chile are researching the effectiveness of sperm competition in penguins. Lead by Dr Lloyd Davis of Otago University, the study will compare the penguins based at Cape Hallett with those on Ross Island.

The team are hoping to overcome last year's access difficulty by

hitching a lift on an ice-breaker from McMurdo.

To breed successfully, female Adélie penguins must acquire a mate that will provide adequate care, while males must ensure that the care they provide is not misdirected. Evidence suggests that one way males try to do this is by sperm competition. DNA fingerprinting and detailed observations of copulatory patterns are being carried out to test this.

Migration mortality is the single

most important factor influencing the demography of penguins. This study asks what are the factors that influence the migration mortality of penguins? It will employ satellite telemetry using new transmitters that record the swimming and diving behaviour of migrating penguins, as well as their location, to correlate their migratory patterns with environmental features such as ice conditions, bathymetry, temperature and prey distributions.

ECOLOGY OF TERRESTRIAL ANTARCTIC INVERTEBRATES

by Dr. David Wharton, Department of Zoology, University of Otago.

When most people think of Antarctic animals they imagine penguins, seals and whales. However, these are all dependant upon the sea which surrounds Antarctica. The true Antarctic animals, which spend all their time on land and are dependant upon its resources, are microscopic invertebrates which live associated with the sparse growth of moss and algae made possible by meltwater from snow, glaciers and around the edges of lakes and

ponds. These animals live in one of the harshest environments on Earth and must survive desiccation and low temperatures. These survival abilities are a major focus of our research.

Brent Sinclair, a PhD student at Otago, is working on mites and springtails. Brent is the holder of an Antarctic Scholarship and has recently been awarded a grant from the National Geographic Society (USA). He will tell you about his work in a later article. Here I want to describe our research on nematodes, worm-like animals about 1 mm long,

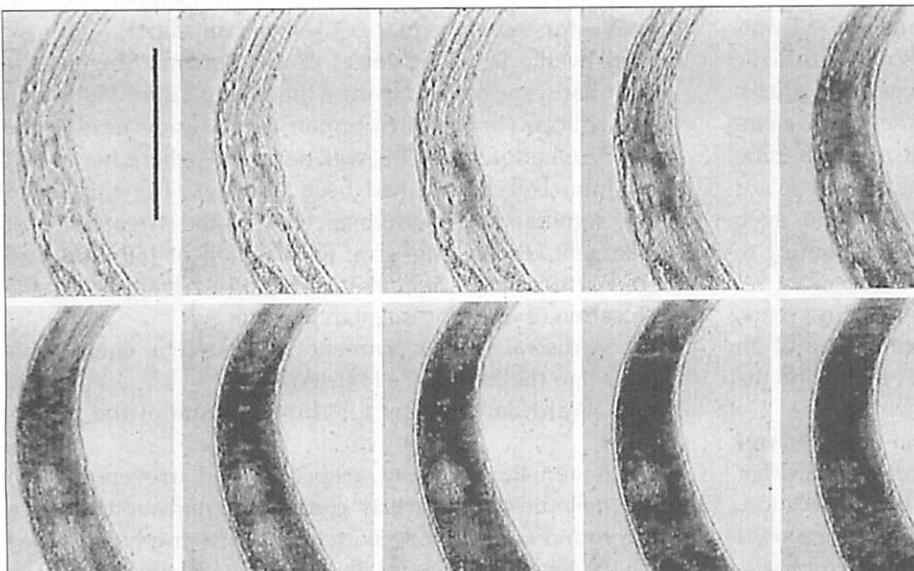
which has focused on how they are able to survive freezing.

In 1989 I isolated an Antarctic nematode and established it in culture. It has been growing in my lab ever since. It is proving a valuable model for the study of how animals are able to survive freezing. The nematode freezes when the water surrounding it freezes. We recently demonstrated that ice forms throughout the entire body, including within its cells. This is the first time that the survival of intracellular freezing has been demonstrated in an intact animal and if we can understand how the nematode is able to survive in this remarkable way it could have important applications in the storage of biological materials for a variety of medical and industrial purposes.

We have evidence that the nematode produces compounds which affect the way ice forms in its body and this may prevent damage to its cells.

This season I returned to Cape Bird to see if freshly-collected nematodes would do the same as those which have been in culture for the past nine years. I'm pleased to say that they did!

We are now focussing on the mechanisms which enable this remarkable animal to survive such severe freezing stress.



The freezing of *Panagrolaimus davidi*, a terrestrial Antarctic nematode. Freezing, indicated by darkening, starts at a region near the oesophagus and spreads throughout the body until all parts are frozen.

BENTHIC COMMUNITIES IN LAKE VANDA

by Ian Hawes

For most of December 1997, a team of scientists from NIWA laboratories in Christchurch (Ian Hawes, Anna Schwarz and Alastair Suren) and Wellington (Steve Mercer) were at Lake Vanda, investigating the benthic communities in the upper 24 m of the lake.

A microbial mat, comprising a matrix of diatoms and cyanobacteria (blue-green algae) covers the bottom of the lake. The aim of this project was to determine how the mat is adapted to the unusual light regime beneath a thick, permanent ice cover, what contribution it may make to whole lake nutrient and carbon dynamics, how it has responded to the recent rises in lake level (Lake Vanda has risen by 10 m since records began nearly 30 years ago) and what the mats can tell us about changes in the lake prior to our records beginning.

Scientists examined the biomass, species composition, pigmentation, light absorption properties and light requirement for photosynthesis from samples taken at regular depth intervals from the edge to 24 m.

Access to benthic material required diving as it is virtually impossible to obtain high quality samples by any other method. In the event, the most spectacular findings of the trip would have been missed if we had not been able to see the communities.

Diver access required a large hole in the ice surface (see photo above). This hole was made using a combination of conventional hand drilling and melting. We used a commercial stream cleaner, modified to pump heated antifreeze mixture through a copper coil to enlarge drilled holes until they were sufficiently large to be used safely. Special diving techniques were used to ensure minimal disturbance.

Our initial findings show that the benthic communities demonstrate a clear signature of recent environmental changes. Biomass of benthic material increases with depth below the ice in a way which corresponds to their history of time of immersion. Periods of rapid rise, such as occurred in the early 1970s, can be seen in the pattern of biomass versus depth in the way that tree rings reflect climatic



Diving through the hole in the ice cover of Lake Vanda. For this dive Steve Mercer (left) is acting as tender on the safety line, Alastair Suren is operating the communication slink with the diver Ian Hawes. Anna Schwarz, the standby diver, took the photo.

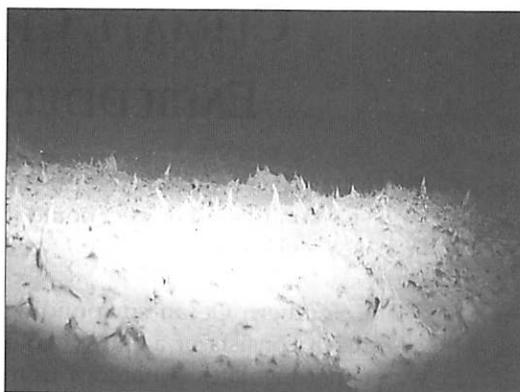
variation. This year's data have led us to hypothesise that the upper 24 m of Lake Vanda is in fact much younger than had been previously thought, and we hope to test this hypothesis as data are examined more thoroughly, and during a return field trip next summer.

Perhaps the most spectacular findings of our trip were the fields of "mat pinnacles" which cover much of the

bottom (see photos below). These are structures up to 15 cm tall, spaced just a few cm apart and comprised only of micro-organisms. The size of pinnacles increases with depth, probably another consequence of the different times of flooding of the lake bottom. These pinnacles seem to be hot spots for productivity of both algae and the only animals found in the deeper mats nematodes.

Further field work is planned for the next two seasons, when we will be working at Lake Vanda, and with US colleagues in the Taylor Valley lakes. Work at Vanda will build on our findings, and we are particularly interested in extending sampling to include the deeper, older mats.

Initial estimates of photosynthesis show that mats are very efficient absorbers of light, and rates of photosynthesis are high, yet accumulation of material is slow. We intend to investigate the nutrient uptake rates of the mats to examine the extent to which development is limited by the extremely low nutrient loading to the lake and the importance of uptake of nutrients by mats on the chemistry of the lake itself. This project was funded by the NZ Foundation for Science, Research and Technology and Antarctica New Zealand provides the logistic support.



Spectacular growths of microbial pinnacles in benthic mat at 16 and 20 m depth on the bottom of lake Vanda. [The circular area is 0.4 m in diameter].

OCEAN pH CAUSES GREENHOUSE EFFECT

New research funded by the National Science Foundation's division of ocean sciences suggests that assumptions used for 50 years in reconstructing some aspects of earth's climate history have lacked a critical variable: fluctuations in the acid-base balance of the ocean.

The discovery could help explain why atmospheric carbon dioxide has increased since the last ice age, and improve understanding of the

ocean's role in global climate change.

"If the changes we see in the fossil record were due to changes in the ocean's pH, it means we'll have to take a look at the ocean's carbon-buffering system as a controller of 'greenhouse gases'," explains lead researcher Howard Spero of the University of California at Davis. "It will reinforce the notion that oceanic processes drive climate."

Spero and other geologists discov-

ered the importance of ocean pH during studies of living marine organisms called foraminifera. Many long-standing conclusions about ancient climate are based on analyses of fossil foraminifera shells. "Geologists, paleogeologists, and paleoclimatologists have been using foraminifera to reconstruct earth's climate history," says Spero. "Using this new parameter will allow us to more completely tell the story."



UNITED STATES

HIGHER OCEAN TEMPERATURES THICKEN ANTARCTIC ICE SHELVES

On the face of it, it sounds like a contradiction, that the 2.5°C warming of the ocean, noted over the past 50 years, could actually reduce the rate of melting for Antarctic sea ice. K.W. Nicholls, writing in the 31 July 1997 issue of *Nature* (US), however, purports that this contradiction is, in fact, what is happening beneath the Filchner-Ronne Ice Shelf in the southern Weddell Sea near the Antarctic Peninsula.

Floating ice shelves, such as the Filchner-Ronne, are sensitive to climate change on both their upper and lower surfaces. Nicholls took measurements to examine what is happening to the lower surface of the Filchner-Ronne. Relatively warm (-1.9°C) High Salinity Shelf Water (HSSW) forms north of the ice front at the seaward edge of the ice shelf. From the edge of the shelf, the HSSW flows beneath the shelf toward land until it reaches the base of the Filchner-Ronne, where the huge ice mass attaches to the land mass. This influx of warmer water causes melting of this ice base.

Nicholls noted that summer conditions do not increase the temperature of the HSSW, it remains fixed at -1.9°C. But they do decrease the volume of HSSW that flows beneath the ice shelf. The reduced volume of the warmer water means

a reduced influx of heat to the base of the ice shelf, so the ice thickens.

"Seasonal warming," writes Nicholls in the *Nature* article, "results in a corresponding reduction in the melting at the base of the Filchner-Ronne Ice Shelf . . . To the extent that this is an analogue for a

warming climate, it suggests that for as long as HSSW dominates the oceanographic conditions over the continental shelf, the response of the ice shelf to a warming climate will be for it to thicken, reinforcing rather than threatening its longevity."

CLIMATE CHANGE HISTORY EMBEDDED IN ICE SHEET

The Antarctic ice sheet is the earth's largest accumulation of ice. Should it melt, sea level would rise by 50 to 60 metres.

The Southern Ocean surrounding Antarctica consists of a ring of cold water that insulates Antarctica from warmer waters to the north, keeping this ice sheet frozen in place. The Antarctic ice sheet and adjacent Southern Ocean together form the Antarctic ocean-cryosphere system, one of the most important components of earth's climate system.

A research team departed Capetown 15 December aboard the world's largest scientific drill ship, the *JOIDES Resolution*, on an expedition to reconstruct historical climate changes in the Antarctic.

Using several new methods, oceanographers are attempting to

better understand the history and stability of the ice sheet. The research is funded in part by the NSF and sponsored by the international Ocean Drilling Program.

"The build-up of the Antarctic Ice Sheet around 40 million years ago led to dramatic changes in earth's climate system and biosphere," says David Hodell, co-chief scientist of the expedition, and a researcher at the University of Florida. "Earth's climate changed from a relatively warm 'hothouse' to a cold 'icehouse'."

Although scientists recognise that the Southern Ocean has played a major role in defining earth's climate system, many questions remain regarding the history of climatic and oceanographic changes in this remote region.

HIGHER OCEAN TEMPERATURES . . . AFFECT KRILL AND OTHER MARINE ORGANISMS

Krill (*Euphausia superba*) like cold winters. They feed on algae that grow on the underside of sea ice and in years when cold weather prevails and the sea ice is extensive, krill populations thrive. In warmer years, their numbers shrink, affecting the entire antarctic food chain as well as commercial fishers who harvest them.

Valerie Loeb from Moss Landing Marine Laboratory in California worked with American and German colleagues to study the effect of fluctuating winter temperatures on the population of krill in the area around Elephant Island, just off the tip of the Antarctic Peninsula. They theorised that krill populations may be decreasing, on the basis that only one or two of every five recent winters produces extensive sea ice, compared to four out of every five winters 50 years ago. This is on the understanding that, in general, winters in Antarctica have increased in temperature over the past 50 years. Loeb and her fellow researchers found that, compared with counts done a decade ago, krill populations had decreased by a tenth.

Despite their small size, krill are a

key link in the southern ocean food chain, contributing to its amazing abundance. Fish, birds, and whales all consume large quantities of the shrimplike crustaceans. Even human fishers harvest the krill to be cooked and peeled and made into sausage, fish paste, or livestock feed. Because krill are so vital to the entire Antarctic food chain, scientists are monitoring the natural fluctuations in krill populations as well as the impact of commercial harvesting.

Krill compete for algae with gelatinous creatures called salps. When there are fewer algae to go around, the competition is keen. In the years when salps thrive and krill decline, the effect on the rest of the food chain can be dramatic because many vertebrates that eat krill, won't eat salps.

Other marine biologists believe that the increased salp blooms may not curb krill populations. Robin Ross, a biological oceanographer from the University of California's Santa Barbara Marine Science Institute, notes that migration should be factored into the equation. "Centres of abundance in krill seem to shift from year to year," she comments.

RECENT US ANTARCTIC RESEARCH HIGHLIGHTS

- Excavations at Cape Shirreff revealed the remains of a female skull c. 170 years old, indicating a Mongolian-Caucasian origin
- Modelling methods using computational fluid dynamics and a finite area element model, predict snowdrift accumulation patterns
- The atmospheric convergence line and the Antarctic Divergence region cause polynya activity in the southern Indian Ocean
- Data indicate that the area of the Filchner-Ronne Ice Shelf is about 1700 sq. km larger than was previously thought
- Tropospheric trace gas column abundances are up to 10 times higher in the Arctic compared with the Antarctic
- Midwinter tropospheric wave energy may be the best predictor of the severity of the ozone hole the following spring.



BELGIUM

NO NATIONAL EXPEDITIONS TO THE ICE THIS SEASON

The Belgian Scientific Research Programme on the Antarctic, initiated in 1985, demonstrates Belgium's commitment towards strengthening the scientific knowledge of the area covered by the Antarctic Treaty.

The programme is funded, managed and co-ordinated by the Belgian Federal Office for Scientific Technical and Cultural Affairs (OSTC). Research is implemented in three-yearly projects undertaken by university-based scientists.

The budget for Belgium's fourth phase for the years 1998-2000 amounts to 236,000,00 BEF (about US\$6,600,000).

In addition the OSTC is contributing a sum of 20,000,000 BEF (about US\$563,000) to the operational costs of the European Project for Ice Corring in Antarctica (EPICA).

The Belgian Antarctic research programme comprises eight research lines under three priority areas: Marine Biota and Global

Change; Dynamics of the Southern Ocean; and Palaeoenvironmental Records.

No national Belgian expedition will go to the Antarctic this season as all activities for 1997-98 are embedded in scientific expeditions organised by other Antarctic Treaty member countries.

This season Belgian research teams are conducting joint research projects with teams from Australia, France, Germany, New Zealand and USA.



CHINA

SNOW DRAGON VISITS LYTTTELTON

Haute cuisine greeted a New Zealand delegation when it visited the Chinese Antarctic supply ship *Xue Long* at Lyttelton, New Zealand on 4 December 1997. The 21,000 tonne ship was on its way to Antarctica and put into New Zealand for four days to take on food, fuel and freshwater. It was the ship's second visit to the Lyttelton, the first occurring in 1996 (*Antarctic* vol. 14 no. 1).

While in port, the ship took on 800 tonnes of fresh water to replenish its 2500 tonne water tanks. In Antarctica, the end point of the longest voyage yet made by the vessel which will take 146 days Shanghai to Shanghai, the ship will supply its two bases, Zhong Shan and Chang Cheng (Great Wall Station), at the same time exchanging scientific and base staff.

The *Xue Long*, meaning "Snow Dragon", was built in the Ukraine in 1993 especially for the Chinese Antarctic expeditions. The ship is 167 metres long, with an ice-strengthened hull capable of breaking through 1-2 metres of ice, or 3 metre thick ice with a bit of speed behind its considerable bulk. As well as having a large cargo capacity, apparent from



The *Xue Long* at Lyttelton, looking towards the bow. Photo: M. A. Bradshaw

the huge derricks on its deck, the ship also has accommodation for 130, including 46 crew. Some research will be done from the ship as part of a cooperative research programme with the US on the Weddell Seal. This year the Chinese will also be involved in a 500 km inland traverse to undertake snow, ice and meteorological studies.

After taking tea, and later a tour of the bridge with its state of the art

electronic and computerised equipment, the New Zealand delegation, which included a representative from the US National Science Foundation, enjoyed a marvellous meal in the Captain's mess. Despite the padlocking of their meat fridges by New Zealand Customs, the chef outdid himself with delicious and seemingly never ending dishes of prawns, various fish, squid, seaweed, and other seafoods, accompanied by quail's eggs and a robust Chinese wine. Language was not a problem as the interpreter Yilin Wu, who will be wintering over at Zhong San base as Station Leader, spoke good English, as did Captain Shaohong Yuan.

Cordial relations continued the following day when the leaders of the expedition and many of the ship's company visited the Antarctic Centre, specifically to view the New Zealand programme's premises, and to enjoy displays at the Antarctic Visitor Centre. A Chinese film crew were at hand to record the visit, and to note the various presentations that were made by both the Chinese and by *Antarctica New Zealand*, the Antarctic Visitor Centre and the New Zealand Antarctic Society. The only cold note about the entire visit was a sharp easterly wind off the sea, and



The New Zealand delegation aboard the *Xue Long*. Left to right; front — Gillian Wratt, Antarctica NZ, Jia Genzheng, Deputy Director Chinese Antarctic Administration, unknown senior official; back — Yilin Wu, 1997/98 Leader, Zhong San Station, Margaret Bradshaw, NZ Antarctic Society, Richard Benton, Antarctic Visitor Centre, Tim Higham, Antarctica NZ, Polly Pendale, NSF, Shaohong Yuan, Captain of *Xue Long*. The photograph of the *Xue Long* in Antarctic ice was presented to the New Zealand delegation by Jia Genzheng. Photo: M. A. Bradshaw

the comment by the Chinese that the New Zealand summer seemed as cold as a Chinese winter.

China's involvement in Antarctica began during the 1979/80 season when two Chinese scientists joined ANARE at Casey Station. Two years later they collaborated with New Zealand in a Dry Valley research project, and for a while options were considered for establishing a permanent base on Ross Island. In 1985 China organised its first National Antarctic research expedition (CHINARE), and Chang Cheng (Great Wall) Station was built on the Fildes Peninsula of King George Island. It was initially manned as a

summer station, but was later occupied year-round. Zhong Shan Station was established in January 1989 in the Larsemann Hills 80 km south of Australia's Davids Station in Prydz Bay and has been continuously occupied ever since. According to Captain Shaohong Yuan, the Station is not an easy site to supply by large ship as it is difficult to anchor there. Previously, the *Xue Long* has had to use its engines to hold position, off loading fuel, supplies and people in small boats.

Left: Giant derricks tower above the deck of the Xue Long; looking towards the stern from the roof of the bridge. Photo: M. A. Bradshaw



TRIBUTE

VETERAN EXPLORER TURNS 90



*Fuchs at Depot 700 on the Polar Plateau.
(Photo John Claydon)*

By John Claydon

Another significant milestone was reached by Sir Vivian Fuchs when he turned 90 on 11 February 1998. He celebrated the event quietly at his home in Cambridge, England and a marquee was erected in the garden to cater for the large number of visiting friends.

Bunny's son Peter had a brilliant idea for a memento of the occasion — birthday greetings and cards were received from all over the world and Peter is mounting them in an album which his father can quietly browse through at his leisure. Bunny Fuchs is well remembered in New Zealand and greetings were sent by Antarctica New Zealand, the NZ Antarctic Society of which he is a life member and also by the Antarctic Heritage Trust of which he is an Associate Patron.

Sir Vivian was the guiding force

behind the 1955-58 Commonwealth Trans-Antarctic Expedition, the last major Antarctic expedition in which donations from the public made up the bulk of expedition finances. As overall leader of the expedition Sir Vivian was fortunate to have Sir Edmund Hillary leading the New Zealand section and there is no doubt that Sir Edmund's fame as conqueror of Everest helped considerably in gaining such magnificent support from the public.

Sir Vivian attained his doctorate as a geologist at St John's Cambridge and his love of adventure took him on expeditions to Greenland and Africa. Following service in World War II he was appointed to command the Falklands Islands Dependencies Survey. It was during a 500 mile journey with dog teams from the FIDS Stonington Island base that the concept of crossing Antarctica developed in his mind.

He and a fellow geologist were trapped in their tent for several days by a severe blizzard and they discussed at length the possible geology of the unexplored parts of Antarctica and the prospects of an expedition to carry out scientific studies in those areas. The tentative plan was for a journey from the Weddell Sea to McMurdo Sound in the Ross Sea, via the South Pole, a distance of nearly 2,000 miles, using tracked vehicles with dog teams and aircraft in support. It was some years later however before his ideas came into fruition.

In the event the TAE route was from Shackleton Base in British Antarctic Territory to the South Pole, and through French and Australian Territory to Scott Base in New Zealand territory carrying out seismic sounding and a gravity traverse to determine the depth of the polar ice sheet and the form of the rock surface beneath.

We can thank Fuchs and the TAE for the establishment of a permanent New Zealand Antarctic base at its present location.

The name Scott Base for the NZ section of the expedition was chosen by Fuchs and his London Committee of Management, to complement the British Shackleton Base near Vashel Bay in the Weddell Sea.

Following the arrival of Hillary's expedition at McMurdo Sound, reconnaissance by tractors and dog teams to the planned Butter Point base site revealed that this site would be unsuitable. Access across the bay for expeditions, to the polar plateau by snow vehicles, and aircraft operations from the vicinity of Butter Point would all have been out of the question.

Hillary made the hurried but wise decision to locate Scott Base at its present position at Pram Point, following the recommendation of Admiral George Dufek, commander of the USN Operation Deep Freeze.

At the end of the expedition the NZ Government took over the Scott Base facility and the base has since been rebuilt.

TOURISM

TALKING ECOTOURISM TO LARGE TOURS

In an informal talk in December at the Antarctic Visitor Centre, Christchurch, Polly Penhale, NSF, presented an overview of tourism in Antarctica. In the 1990-91 season 1055 tourists visited Antarctica, but this year 10,590 tourists are expected. Antarctic tourism has increased in a big way, and most visits are by ship. More research ships are now combining tourist activities within their scientific programme, and overall, the cost of tour visits has become more affordable.

Tourist numbers fluctuate each year depending on the type of ships travelling south. At one end of the scale are the small ecotourism vessels carrying small numbers, while at the other end are the occasional visits by huge tour ships such as the *Hanseatic* carrying 781 people, the *Akademic Ioffe* carrying 879, and the *World Discoverer* carrying 885. Most of the Antarctic tour companies now belong to IATO

which has established standards for visits and recommends the use of smaller ships to ensure the lowest impact on the environment and its wildlife.

Long term impact studies, for instance by Bernard Stonehouse on Thorgassen Island, are critical for determining the future of tourism in Antarctica. Certainly the effects on national bases can be quite devastating, especially in the Antarctic Peninsula which bears the brunt of the tourism industry. In the late 1980's, US Palmer Station was welcoming a reasonable number of tourists each year, but when these numbers grew far larger, the base felt obliged to turn tourists away in order to fulfil its scientific programme. This upset many US tourists, and consequently Palmer reopened its doors to carefully scheduled and controlled visits with a 72 hour notice.

The Antarctic souvenir trade, involving T-shirts, patches and post-

cards, is a money spinning offshoot of the Antarctic tourism industry. The old British base at Port Lockroy was recently renovated, and sales to a huge number of tourists that visit each year help to pay for its summer caretaker.

It is still early days to get a clear picture of how tourism is effecting Antarctic wildlife, despite the strict guidelines that are enforced. Although a flag-line exists at the Thorgassen Island penguin colony beyond which tourists must not go, the penguin population is decreasing at 10-15%.

Surprisingly, there is a much steeper decline (25%) in the penguin population of the well protected Lichfield Island, which is out of bounds to tourists.

Other factors, such as a regional rise in temperature that causes snow melt during the critical breeding period, need to be considered. Subantarctic tourism is equally as busy.

BOOK REVIEW

SCOTT BASE ANTARCTICA

A History of New Zealand's Southern-most Station, 1957 - 1997

by David Crerar

The thanks of OAE's (Old Antarctic Explorers), former residents of and visitors to Scott Base and the wider Antarctic community, are extended to the New Zealand Antarctic Society for arranging for the publication of *Scott Base Antarctica*.

The Society chose well in selecting David Harrowfield to author the text. David has drawn on his immense knowledge of Antarctic history and his personal experiences of Scott Base to create in a relatively short booklet form words and pictures describing Scott Base and its environment to the reader.

After a brief introduction David Harrowfield takes the reader through the initial planning stages for Scott Base including the political

reasoning behind its establishment. The chapter on construction of the hut draws heavily on the records of Frank Ponder "The Man From The Ministry" and then records the occupation of Scott Base by the TAE-IGY party lead by Sir Edmund Hillary.

The narrative continues to take the reader through the history of Scott Base in chronological sequence highlighting achievements, visitors and tragedies. Reconstruction of Scott Base began with Q Hut completed in 1977 with Stages 3(A) and 3(B) (the new sleeping accommodation, bathrooms, and kitchen/mess) completed in the 81-82 season.

A pleasing aspect of David's writing is that any reader who has visited Scott Base will be able to identify with a particular era recorded. The personalities too are

well identified. Friends of the late Garth Varcoe and the late Cas Roper will smile knowingly over their interchange during one of the many blasting exploits conducted by Garth.

In a note of mild criticism I am sure that David Harrowfield has in his compendium of anecdotes further stories in the vane of "The Tip Of The Iceberg". The personalities of Scott Base and their humour could be expanded. Perhaps this is the task for David and a second edition to his Book on the Fiftieth Anniversary of Scott Base.

On a final personal note I commend to the Antarctic heritage Trust the preservation of "A Hut" as a important historic building of Antarctica. There was a break of forty years between Shackleton's

Continued on page 98

FEATURE

40 YEARS AGO

NZ TRACTOR PARTY REACHES POLE

Part V of a series by Margaret Bradshaw

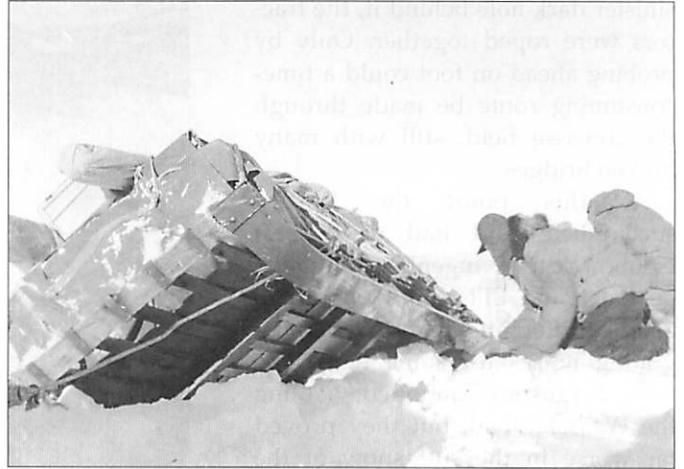
By early December 1957 the New Zealand tractor party was in the final stages of its preparation for its historic thrust to the South Pole.

On 6 December Depot 480 had been fully stocked on the Polar Plateau and the hard-working tractors overhauled. Peter Mulgrew had rejoined the party and on the last supply flight in the Beaver, Doug McKenzie, press correspondent, was flown in as a spare driver, to his surprise. The tractor team comprised Ed Hillary, Jim Bates, Murray Ellis, Mulgrew, Derek Wright and McKenzie.

The tractor party left the depot on 6 December, six days behind George Marsh and Bob Miller who were steadily sledging ahead with their two dog teams. The two hardened sledgers took turns leading the route for three-day spells, something that both dogs and men enjoyed. They were travelling across a landscape that had few landmarks, and were a week away from any other humans. They underwent unexpected and unceremonious visits into crevasses, fortunately without injury. Serious crevasse fields were reported back to the tractor party.

When their sun compass told them they had reached the 146 meridian, the men turned due south. They were forced to skirt the western side of a large and extremely disturbed area where the Byrd Glacier drained eastwards off the Plateau, where uplifted ridges 7-12 metres high blocked progress. Eventually, after a region of giant sastrugi almost two metres high, they reached the position chosen for the Midway Depot.

On 7 December Harry Ayres and Roy Carlyon, with two dog teams had headed east on their own, aiming for Westhaven Nunatak near the Darwin Mountains. Further north, a depot had been laid halfway between Carapace



*The Tractor Party struggling to extract a heavily laden sledge from a crevasse.
Photo courtesy of Antarctica New Zealand Archives.*

Nunatak and Allan Nunatak (now Allan Hills) for the Northern Party. Bernie Gunn and Guyon Warren had sledged to the Allan Hills, discovering coal and fossil plants, while Richard Brooke and Murray Douglas had climbed Tent Peak (later Mt Brooke) to set up a survey station.

Earlier on 5 December the party had together travelled north along the plateau edge of the Mawson Névé to Battlements Nunatak. Surveying on the narrow and exposed crest, Brooke remembered: "... I suddenly became aware out of the corner of my eye of something that ought not to be. I was so startled I almost lost my balance. It was a beautiful snow petrel soaring in the up-draught off the cliffs like a sea-gull in a gale at home. It whirled around for a moment or two and then went off in the wind. It was thrilling for us; the first sign of life of any kind we had seen since leaving the coast".

Moving now northeast towards Trinity Nunatak, steep slopes caused numerous problems, where, even with rope brakes, sledges and dogs went in different directions. The only thing broken was a shovel handle. After completing a survey station on the nunatak on 9 December, they continued down hill, camping near Fry col on the watershed between the Mawson and Fry Glaciers. Returning to the Mackay Depot, they then began travelling south towards the head of the Wright Valley.

Meanwhile, far to the south, Miller and Marsh had continued beyond Midway Depot, moving steadily through a mixture of sastrugi crowned ridges and wide soft snow-filled hollows. Both dogs and men were unnerved when they encountered breakable wind crust phenomenon for the first time, when half an acre of snow abruptly settled about 30cm with a dull booming sound as soon as the dog teams ventured across.

The Tractor Party left six fuel drums at Midway



*Bob Miller of the Southern Party outside the tent on the Polar Plateau.
Photo courtesy of Antarctica New Zealand Archives.*

Depot for the Crossing Party, and pemmican for the dogs. But not long afterwards, they crossed an area of crevasses that had been reported as harmless by the dog men, but which seemed unable to tolerate tractors. After the lead tractor had lurched over one snow bridge, leaving a sinister dark hole behind it, the tractors were roped together. Only by probing ahead on foot could a time-consuming route be made through the crevasse field, still with many broken bridges.

At this point the Weasel succumbed, and had to be left behind, despite ingenious attempts by Bates and Ellis. Both the clutch and the differential had been making grating noises for some time. The three Fergusons continued, hauling the Weasel's load, but they proved far worse in the soft snow of the broad hollows than had the Weasel. All these misfortunes meant the tractors did not catch up with the sledging team as anticipated, and were still well behind them when the dog teams arrived at the proposed site of Depot 700 at 83°S, on Black Friday 13 February. By driving long hours the tractors came to within 11km of the depot by the 14th, when Bates and the lead tractor slumped backwards into a crevasse as the bridge collapsed. It came to rest some feet down, wedged, with the coupling bar pointing to the sky. When Hillary called down to ask if he was all right, he said he was, but he didn't like the view! After several hours of manoeuvring and hauling, the tractor was retrieved and they reached Depot 700 that day.

The next day was a memorable for Carlyon and Ayres in the Darwin



A view north from Mt Brooke across Allan Hills towards Battlements Nunatak. Several survey stations were set up in this area by the Northern Party. Tents for scale on snow at right.
Photo M. A. Bradshaw.

party. After leaving Depot 480 on 7 December they had made good time to Westhaven Nunatak. They had encountered crevassed areas, but had successfully negotiated them. By 15 December they had successfully got themselves out of a crevassed blue ice area in the Darwin Glacier Névé, had a brief cocoa break, then continued. Ayre's team had disappeared over an undulation, but when Carlyon breasted it, he saw Ayres waving. Neither sledge nor any of the nine dogs were to be seen, all having fallen into a crevasse. The sledge was jammed vertically about three metres down but there was no

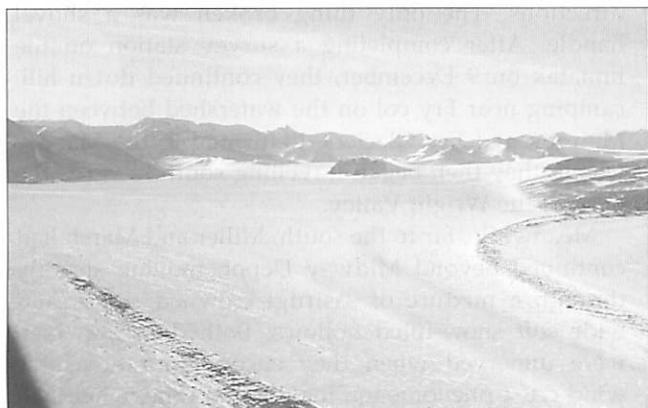
sign of the dogs, only a distant whimpering from the dark blue depths. Ayres had been lucky; he had been skiing alongside the sledge and when the bridge collapsed, had managed to throw himself clear. The men rapidly anchored a wire rope to secure the heavy sledge and hanging dogs. Ayres was lowered down on a rope, and while he

wedged himself with feet against one wall and back against the other, two dogs were hauled up a second rope. After a break to "warm up", Ayres went down further and sent up four more dogs. After another spell on the surface, he reported that one dog had been killed but that two more were alive at the bottom of the crevasse with their precious jerrycan of kerosene. Carlyon went down the 20 metres to the bottom of the crevasse and rescued both dogs and kerosene.

They then unpacked the essential gear from the sledge and pitched camp after six hours of struggle. The next day they took turns to go down into the crevasse to unload the sledge before hauling it out, and then Ayres made one last trip to the bottom of the crevasse to retrieve the Christmas cake that had been baked by his wife Jean. After repairing the damage, they then took the precaution of carrying the radio on the second sledge in case the first sledge broke through again.

They then realised that the mountain they had been aiming for was not Mt Keltie, and instead called it New Mountain (now Mt Ayres). They climbed the mountain the next day, discovering a superb panorama and the perfect site for a survey station. On 24 December the Darwin party completed a base-line near Mt Longhurst. On the same day, the Northern Party had arrived at the head of the Wright valley, camping at Mistake Nunatak, so called because it did not give them the view they hoped for into the valley because of a mountain further east (Shapeless Mt). Crowding into one tent that evening they sent and received Christmas greetings from both Scott Base and the other field parties, and later from friends and relatives in New Zealand. On Christmas day they climbed Mt Shapeless, but skied back in a minor blizzard.

By this time the Southern Party of Marsh and Miller had left the tractor train at Depot 700 to explore the region towards Mt Markham. They



The confluence of the Darwin and Hatherton Glaciers looking towards the Britannia Range. Harry Ayres and Roy Carlyon set up a survey station on Mt Henderson, (pointed peak right distance) and on the flatter topped Mt McClintock (centre distance). Photo M. A. Bradshaw.

had waited until the poor weather at Scott Base cleared so that John Claydon could start flying in with supplies on 18 December before they left the following day. After two days of heading east, Bill Cranfield landed beside their camp, aided by a Sarah Beacon, to bring in food and kerosene. This made the sledging loads much greater than they preferred, for they had hoped for an aerial resupply further along their route. The heavy loads were especially critical every time there was a sledge capsized. On Christmas Eve the two men made a depot of part of their load and settled down to listen to the Christmas messages over the radio. On Christmas day they sledged 29km then made a giant snow cairn to mark a cache of dog food and kerosene, and called it Christmas Depot. Christmas dinner was a Marsh cocktail of medicinal brandy, lemon crystals and hot water followed by tinned frankfurters and mashed potato.

In the Cook Mountains on Christmas Day, Ayres was cook. After chicken, anchovies on biscuit, Christmas pudding and dried milk "cream", Carlyon wrote: *"By this time extended stomachs were issuing warnings but we pressed on grimly with Christmas cake and muscatels. One rather desiccated cigar was then shared with all the appearance of enjoyment. For supper we had chicken soup with shrimps on biscuit. Despite difficulties we consider this Christmas day a most memorable and enjoyable one"*.

Meanwhile, the tractor party had become victim to the intrusive uncertainty of politics. Because the New Zealand party had made good time, but Fuchs's crossing party had only reached 80°S, Hillary was keen to carry on beyond Depot 700. On 5 December he had sent a telegram to the Ross Sea Committee saying that he intended to carry on south to meet Fuchs, and afterwards continue to the South Pole, where Admiral Dufek had agreed to evacuate the party by air. The tractors were to be left at Pole Station. The committee replied that they did not want Depot 700 left unmanned and were unhappy about any attempt to go beyond if it stretched existing resources or threatened the main TAE crossing. The day that Miller and Marsh had left the Depot, Hillary again telegraphed the committee to inform them that the depot had been successfully established and that he intended travelling further south. The committee wanted Fuchs's approval of this development, and this to be reported through the committee before it gave its own approval. One of the biggest problems was that Hillary was unable to communicate directly with Fuchs's party until they drew much closer.

On Boxing Day Hillary reported much better surface conditions to Scott Base, with the average 8km a day improving to 17km. He added *"We are heading hell-bent for the Pole, God willing and crevasses permitting"*.

On 27 December, Scott Base transmitted a telegram to Hillary from the Ross Sea Committee: *"For clarification will you please answer the following questions: One: Did Fuchs agree to your going to the Pole? Two: Having reached the Pole*



Guyon Warren of the Northern Party inspects a large sastrugi on the edge of the Polar Plateau. Photo courtesy of Antarctica New Zealand Archives.



The Boomerang Range at the head of Skelton Névé was one of the most southern localities visited by the Northern Party, as the Skua flies, over 200 km from their most northerly point. Photo M. A. Bradshaw.

do you intend to return by air or will you wait and return with Fuchs thus giving him guidance over the route by which you came? Three: Will you abandon your tractors at the Pole or attempt to run them back to Scott Base; note that they belong to Fergusons not to us? Bowden".

Hillary replied the same day in typical style. *"My plan is to arrive at Pole as soon as we can get there. Answers to your questions are: One: Made no comment; Two: Await Fuchs and see what he requires; Three: Abandon tractors unless Fuchs requires them. Hillary."*

On the same day Fuchs sent an urgent message to Hillary indicating that they were about to leave South Ice and that two of the Sno-cats had track trouble. He recommended that Hillary lay an additional fuel depot between Depot 700 and the Pole and regretted that it would mean abandoning any idea of reaching the Pole with the tractors. Hillary replied: *"Your message has arrived too late as we are now 240 miles from the Pole with only 10 drums left. Have neither food nor fuel to sit here and await your arrival . . ."*

The following day the Tractor Party had reached the point of no return. At 3000 metres the fuel consumption of the Fergusons had increased alarmingly and power output was dropping as they climbed higher and the air became colder. Neither was the soft snow helping, and even at night the tractors were sinking half a metre below the surface. On New Year's Eve it took the party six hours to cover almost 10km. Despite the party having jettisoned all unessential gear at Depot 700, a further cache was left beside the track, and with no reserves, the tractors set off again.

The Northern Party had continued travelling south along the edge of the Polar Plateau, geologising and surveying as they went. Important plant fossils were found on Horseshoe Mountain and fish fossils at Mt Crean. While Bernie Gunn and Guyon Warren geolo-

gised in the Lashly Mountains, Murray Douglas and Richard Brooke travelled south with the dog teams and light sledges to collect supplies from the Plateau Depot on the "tractor trail". The New Year was heralded by John Claydon flying into the Lashly Mountains in the Beaver with mail and beer. On 3 January, the

portion of ground to hand, which measured a mere 10 metres square. Later, looking back from a high point, they realised they had been rounding the end of a further group of mountains, later called the Miller Range. The surface eventually got better, and they reached the first bare rock outcrops that they had touched



*Tractor "Sue", with sun compass, leads across the undulating Polar Plateau, roped to tractors behind.
Photo courtesy of Antarctica New Zealand Archives.*

Northern Party descended onto the Skelton N v  to survey the mountains separating it from the large, broken Mulock Glacier.

In the Darwin Glacier area Ayres and Carlyon had retraced their steps and returned to Westhaven Nunatak. Geological specimens were carefully labelled and wrapped to be left at the depot. They then intended to survey the southern part of the Darwin Mountains, but got off to a messy start when the dogs started squabbling and two escaped and disappeared. Setting off in the hope that they would eventually follow, they were compelled to return to the depot and catch them there.

The Southern party, meanwhile, had been dropping off the Polar Plateau expecting to reach the N v  behind the Queen Alexandra Range, and were surprised when they found another range facing them, later called the Queen Elizabeth Range. On their way towards it on 27 December, they encountered a very heavily crevassed area. So difficult was the route that at the lunch stop both dog teams had to be compressed into the only safe

since leaving Scott Base nine weeks before. The only excitement was Miller having to replace one of Marsh's fillings from the well equipped medical kit.

They received a message from Scott Base saying they would be required at Depot 700 early in January to guide in aircraft bringing further fuel drums for Fuchs party. The two men, a little incensed at the idea of curtailing their programme now that they were this far, replied that they would not be back at the depot until the second week of January.

New Year's day saw them travelling across a tributary glacier (now the Marsh Glacier) of the giant Nimrod Glacier, camping near a col they named "New Year Pass". Climbing steadily to 3000 metres, they passed through New Year Pass to "January Col" and from here they eventually set up a survey on a prominent mountain later called Claydon Peak, 3700 metres high, so linking their newly found landscape with distant, prominent mountains named by Shackleton almost half a century before.

About the same time, the Tractor Party was very close to the Pole. They had exactly 180 gallons of fuel to cover about 110km, and the decision was taken to make a non-stop run for the Pole, travelling day and night. Because they didn't want to waste fuel looking for the pole, their navigation had to be spot on. Hillary checked their position with the sun compass every six hours. On the evening of 3 January, after 20 hours of non-stop driving, Hillary investigated what turned out to be a marker flag.

Exhausted, the men switched off their engines and camped 20km from Pole Station. Before Mulgrew crawled into his sleeping bag he sent the coded message "Rhubarb" to Gawn at Scott Base, so registering their imminent success. This was then transmitted to Arthur Helm, Secretary of the Ross Sea Committee, in Wellington.

The following day the tractors pushed on to the Pole, arriving just after midday, met for the last kilometre by a US Weasel containing Vernon Houk and Palle Morgenson, leaders of the US Station. Although they had enough food for two more weeks, their fuel reserves were down to 20 gallons, enough for only another 30km.

The Americans gave the New Zealanders a magnificent greeting, marvelling that such small and basic contraptions had travelled so far. Hillary had lost 14kg over the journey and was very tired. He was the only one of the five men who had driven the entire journey, but before he descended into South Pole Station, Hillary remembers: *"I took a last glance at our tractor train — the three farm tractors, tilted over like hip-shot horses, looked lonely and neglected like broken toys cast aside after play-time; the caboose now seemed more like a horse-box than ever; and the two sledges had only the meagre load of a half-full drum of fuel. Yes! There was no doubt about it — our tractor train was a bit of a laugh! But despite appearances, our Fergusons had brought us over 1250 miles [2000 km] of snow and ice, crevasse and sastrugi, soft snow and blizzard to be the first vehicles to drive to the South Pole."*

To be continued.

THE RIDDLE OF THE ANTARCTIC PENINSULA

Part I: The Story of the
Swedish Antarctic
Expedition 1901-3 by
David E. Yelverton FRGS

The departure of Otto Nordenskjöld's Swedish Antarctic Expedition from Gothenburg on 16 October 1901 was the climax of a huge personal effort.

Nordenskjöld, nephew of the first man to navigate the North East Passage, was dogged by lack of financial support which he overcame by borrowing money which he spent the rest of his life repaying. His ship was the same Norwegian sealer, the *Antarctic*, in which Borchgrevink had first seen the southern continent. With a largely Norwegian crew led by the renowned Captain Larsen, he was bound for the same route that Larsen had pioneered on the west side of the Weddell Sea.

Fourteen Greenland dogs were brought aboard by the Norwegian Ole Jonassen who had sledged with the Duke of Abruzzi on his North Pole attempt two years before. Weighing anchor on 27 October, they crossed the Equator on 24 November and arrived at Buenos Ayres on 14 December, having lost 10 of the dogs in fights or from heat.

Having previously agreed to take an Argentine naval officer in exchange for the co-operation of the Staten Island Observatory, Nordenskjöld was faced with a demand that the appointed officer, a Lt. José Sobral, be included in the shore party. Despite having designed the base hut for a five-man party, he was persuaded to agree. It was a fortunate decision, for the Argentines promptly offered unlimited help.

Joined by the American artist Frederick (Frank) Wilbert Stokes, who had been with Peary on his first two Greenland expeditions and made a handsome contribution to Nordenskjöld's funds, the *Antarctic* slipped her moorings on 21 December and headed for the Falkland Islands to buy sheepdogs. After managing only to obtain four, the expedition headed south on New Year's Day 1902.

They headed south past the fearsome Cape Horn on 5 January. Their

aim was to pass through the Orleans Channel which Larsen believed ran through to the Weddell Sea between Dumont d'Urville's Louis Philippe Land and the Belgians' Danco Land further west.

The goal then was to establish a winter station as far south as possible on the western coast of the Weddell Sea, preferably beyond Larsen's farthest 1893 sighting in 68 10S. Setting up their first emergency depot on Seymour island, 40 miles south across the gulf, and groping their way southward in fog, the Weddell Sea pack stopped them 20 miles east of Larsen's Cape Framnaes in 66°S. When the weather cleared they could see the towering ice shelf either side of the cape as high as Ross's Barrier on the other side of the world — and above it glimpses of mountain peaks beyond the nearest, Larsen's Mt. Jason. Believing the cape might be suitable for a depot, Nordenskjöld tried ski-ing to it, but after two hours abandoned the attempt.

Determined to try again further east, the retreat to ice-free waters off Ross's Cape Lockyer led to their first real discovery. After a vain attempt to approach Robertson Island, named by Larsen after the captain of the Dundee whaler *Active* (later to command the *Scotia* for William Bruce) Nordenskjöld had Larsen lay the ship alongside the fast ice further north to see if it was suitable for sledging. From there he sighted distant peaks, exactly where Larsen had believed the Orleans Channel emerged from the northwest, and realised he had found the east coast of De Gerlache's Danco Land.

A storm swept the ship eastward that evening. Four more times they tried to break through the pack, once even getting beyond the 66th parallel to the south of the South Orkneys, until on 2 February their dwindling coal forced a retreat. The west coast of Seymour Island seemed to be the only practical choice for their base, even if it

was only 15 miles south of the 64th parallel.

It took three days to extricate the ship from the pack and four more for the 320-mile slog back to the island. Driven out of the entrance to Admiralty Sound by a blizzard, a clearer view to the west opened on 10 February suggested that Ross's Sidney Herbert Sound might be a safer place for their base. They were quickly disabused that evening when the ship ran aground on a sandbank. Unperturbed, Stokes sat on deck to paint the glowing intensity of the clouds after sunset. Although it was just the sort of unique spectacle the



The Shore Party aboard the *Antarctic*, (from left to right) Bodman, Akerlündh, Nordenskjöld (centre front), Jonassen, Sobral, Ekelof

American had come south to find, he had already decided not to stay, for so northerly a base would surely deny him his first artistic passion — the brilliant auroral displays he hoped would excel those in the north. (a vain hope in that region as it transpired).

That resolved the dilemma Nordenskjöld had faced after Sobral was included in the shore party of seven men using the tiny 13ft x 7ft living room in the hut — a bleak prospect during the long winter evenings. The shore party then comprised Nordenskjöld, magnetician Gusta Bodman who also handled meteor work, doctor and bacteriologist Erik Ekelof, José Sobral acting as assistant to Bodman, dog driver Ole Jonassen and the 19-year-old able seaman Gustaf Akerlündh.

Back in Admiralty Sound on 12 February fortune led them to the perfect site sheltered in an inlet on its east coast. After four days, with only the main frame erected, ice from the

north forced Larsen to leave for a final attempt to land the emergency depot on Robertson Island which Nordenskjöld considered vital to a second attempt to get further south the following season.

When Larsen returned on 21 February to report another repulse by the ice the hut was barely completed. Landing another 30 tonnes of coal the six men of the shore party were left on their own that evening as Larsen headed north with instructions to return at the earliest feasible date for another attempt to land them at or beyond Cape Framnaes.

After the calmest of passages across the gulf and back through the Sound later named after his ship, Larsen's fortunes changed abruptly as a violent easterly storm broke on their passage past the coast of King George Island. Saved from shipwreck on a lee shore by Larsen's consummate seamanship the battered *Antarctic* had struggled into Ushuaia on Tierra del Fuego on 12 March with her bunkers almost empty. From there, replenished with free Argentine coal and with the worst damage patched up, she returned to Port Stanley on the 27th for the extensive repairs needed before she could undertake her winter voyage to South Georgia.

Down at Snow Hill, as he now named the shore base, the storm that nearly wrecked the ship had dealt Nordenskjöld another blow. Amid plunging temperatures a Greenland bitch had broken out of her kennel and left her litter to freeze to death. It was the end of his hopes of increasing his derisory dog force so essential to any attempt to sledge south from Cape Framnaes.

Equally vital had been the depot on Robertson Island, which ice might again prevent them landing on. Before Larsen had reached the Falklands Nordenskjöld moved 500lbs of dogfood to a temporary depot at Tortoise Hill (its modern name) on the coast south of Ross's Mt Haddington. (a)

Carrying on with the scientific observations through the winter in temperatures that fell to an average — 25°C in June, Nordenskjöld abandoned the idea of going south in the ship in favour of making the entire

journey from their base, with the ship picking them up if Larsen could get through. The dog food would have to be advanced to Robertson Island at the start of the main journey.

However, during the winter two of the Falklands dogs had been killed in fights after Jonassen failed to tether any of the dogs. With another dog injured and the two bitches nursing litters, they had to start with just three. The plan to move the depot all the way to the island was reduced to establishing it on a convenient iceberg on the way.

The scheme was ruined at their first camp when, with the dogs still not tethered, they awoke to find the two Greenland dogs had deserted, their



The Southern Party ready to start. (From left to right) Nordenskjöld, Sobral and Jonassen.

tracks showing that they preferred the comforts of the base. Moving some supplies to the depot below Tortoise Hill they manhauled the rest back, determined to start again with the four Greenlanders and Kurre, the surviving sheepdog. Soon after their return all the ice went out of the Sound, which was only safely refrozen by 29 September.

Nordenskjöld had by then reverted to believing the ship could get them beyond Larsen's farthest point, and so decided they must be back by mid-November. That left only 45 days for the entire journey, and something had to be done to give them more time. Orders were left for the ship to pick them up at Robertson Island late in November, which he reckoned would gain them another 15 days.

The limitations for inland exploration of a small shore party of the kind Gregory had fought for as the British expedition took shape were

promptly displayed in the compromise now imposed on Nordenskjöld, half a world away from Hut Point, as he worked out the detail of the new plan.

There was room for only 21 days' supply of dog pemmican. That the journey could start at all depended on the fact that they would be following the seaward edge of the coastal fast ice and would find seals and penguins to make up the deficit.

With a load of 700lbs to haul, although that would reduce, any idea of dogs being sacrificed to feed others was out of the question. And the party could not even include a doctor.

As it was, the Greenland dogs, undoubtedly the strongest of all in the Antarctic in 1902 and fed on penguin meat all winter, saved the day. Starting on 1 October and picking up the Tortoise Hill depot next morning, Nordenskjöld and Sobral, pulling 200lbs on the smaller sledge, could not keep up with the dogs and had to transfer 50lbs to the dog sledge. Even then Jonassen had to ride on it to slow their pace.

The weight each dog pulled was almost 150lbs, and must have been more than that for the four northern dogs because the Falklands dog was unlikely to have exerted the same pull. Scott's dogs were never asked to pull such a load on the way to the Bluff a month later, when, pulling 108lbs per dog, they managed 11 to 13 miles per day. That the 65-mile journey from depot to island was accomplished in five days on the move must have been due to a favourable surface, even allowing for Jonassen's experience, the limitations of which were later to be demonstrated.

Losing one day in a blizzard they arrived at the island on 7 October, to be greeted with an unpleasant surprise.

To be continued

Notes

(a) Nordenskjöld (*Antarctica* — Hurst 1977:p130) refers to climbing a small conical mountain above the depot to see the entire coast running west to Cape Foster. That is not possible from Cape Jefford five miles further west above the only other practical site for the depot.

REPORT

A DAY IN THE LIFE AT MCMURDO

by Madison Hall

One October morning, at a regular "jobs to do" meeting, I was selected to travel with a carpenter to a science field camp to repair a heater. A rare change to get out of Mactown and see what is out there — this is what it is all about! Excitedly I jumped into a truck and went to my dorm to pack my camera and warm clothing, in case the weather turned bad or the Sprite broke down. I then suited up with three layers of warm clothing: long Johns, jeans and Carharts, two pairs of socks, Navy Mukluks, a wool shirt, neck gator, ear flapped cap and the Carhart parka.

At the utilities shop I was met by Monica, the carpenter — an attractive vivacious gal from Idaho. She needed to repair the door of the sleeping quarters at the field camp.

On leaving Mactown to travel the 17 mile journey across the sea ice we had to tell Mac at the firehouse where we were going and when we would return. This done, she eased the Sprite, a tracked work truck, onto the sea ice and away we went following the

flagged route. At a speed of between 7-10 miles per hour the trip takes up to an hour and a half. The weather in town was very mild, only about 0 degrees Fahrenheit, but out on the sea ice the cold was more intense at about twelve below.

We could barely see more than a few hundred metres ahead and it felt as if we were inside an ice fog. Monica shut down the engine leaving us with only the sound of our breathing and an eerie sense of isolation. Suddenly she jumped onto the ice, grabbed me by the arms and started dancing — it was as if she were in a fairy tale. This was her first visit to Antarctica's paradise and only the second time on the sea ice outside of Mactown.

After a few minutes of trampling the snow and getting haw frost all over our eye lashes, my moustache and two week growth of beard, we simply had to make snow angels. All we needed was the sound track from the "Snow Queen".

Back on board the Sprite with Monica driving and myself asleep I was aware that we had stopped. We

had arrived at a Y' intersection and Monica asked which way to go. I remembered that the Erebus Ice tongue was on the right and that Razorback Island's turn off was a couple miles further across the ice. A few minutes, through the mist of the ice fog, loomed the rocky spine of Razorback, a small Island maybe a few hundred metres long by only 30-40 metres across. It is surrounded by several smaller islands which are the remains of an extinct volcano called the Dallbridge islands, Little Razorback, Tent and Inaccessible island.

We had arrived, on the north side is the Sealers Science camp with living quarters, the divers tent, the good ol' cold seated toilet, a couple of Sprite's and a snow mobile. Scattered across the ice from one end of the island to the other were mother Weddell seals and their pups. A fascinating sight.

With the door fixed, the carburettor replaced and the stove fired up, we left the science team happy in the knowledge that they could sleep soundly and return from a dive and strip in warmth and comfort.

TRIBUTE

CLIVE PATTERSON 1946 — 1996

Leader of the Historic Huts Caretaker project 1978-79, by friend and Antarctic colleague Drew Brown

Clive was passionate about Antarctica, its history and its preservation. At the age of ten, when young years are supposed to be tender and mild, Clive packed a small amount of gear, a sandwich or two and a big adventure into a day pack and peddled to Harewood runway. There he dodged security (his green commando balaclava as camouflage), padlocked his bike and slipped from the small shadows of the perimeter to the giant shadow of a Globemaster's wing. He tore up a ladder into the fundament's of the planes innards, hid himself and put on his Antarctic Survival gear; a pair of woolly gloves.

Only the loneliness and the inability to share his experiences cast an ever growing doubt on his plans.

Eventually the dire prospect of not

being able to communicate the excitement of flying at -60°C at 24,000 ft proved too much. What on earth was the point of having an adventure if you couldn't share it? He slipped out, resolving to finish his journey one day.

This he did as leader of the Historic Huts Caretaker project in the 1978-79 season. The former Fairlie High school teacher, geography graduate and member of the New Zealand Antarctic Society, Clive found his element and revelled in it. Together with Mr John Oliver of Christchurch, Clive spent several weeks on Ross Island continuing the restoration and maintenance work at Scott's huts at Cape Evans and Hut Point, and Shackleton's hut at Cape Royds.

His reputation for hard work and commitment to that project is still

recalled with awe. His ability to communicate his passion for his work was very evident to those of us who met him at Scott Base that summer, and we enjoyed his immense wealth of humour and anecdotes.

Much of his adult life he made an adventure, sharing his passion for travel and flying with his wife Denise and their children Carl and Lisa. Travelling with his family was certainly one of the major passionate encounters with life.

Tragically Clive was killed in a car accident in the prime of his life, cruelly curtailing his earthly adventures. But such was the strength of his desire to live a full and interesting life the echoes of his experiences and accomplishments will be there for all of us to share for a long while yet.

GENERAL

DO YOU KNOW THIS MAN?

DR LOUIS H. POTAKA

Dr Bruce Young, nephew of Bob Young, a New Zealander who was on the *City of New York* with Byrd on his BAE1 expedition, and later wintered with Byrd on BAE2 (Obit. *Antarctic* vol. 4, no. 7: p. 359), is asking for any letters, papers or recollections concerning Dr Louis H. Potaka, another New Zealander, who served as doctor on Byrd's BAE1 expedition.

Dr Young is currently writing a biographical essay on Dr Potaka, and wishes now that he had spent more time talking to his uncle about Potaka who Bob Young described as "a fellow-kiwi and a good cobbler". Dr Bruce Young pointed out that the Arts & Entertainment Channel video

on Admiral Byrd included the sight of Dr Potaka extracting Stevenson Corey's tooth, although the identity of the doctor was not mentioned in the video. Dr Young would welcome information from any person who knew Dr Potaka, whether in Wanganui, Otago, Murchison, Nelson or Takaka in New Zealand, or previous colleagues from overseas.

Contact:

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SCOTT BASE
ANTARCTICA

Continued from page 90

Ross Sea Party and Scott's Cape Evans Hut being visited by the US Navy. I believe the forty year History of Scott Base requires its original hut to be considered worthy of preservation. The AHT policy of restoring to the condition existing when the original habitants left, would require "A Hut" to be repainted in bright yellow and burnt orange. One wonders how current management of *Antarctica New Zealand* would view this proposal.

David Crerar was Officer-in-charge at Scott Base for the 1988-89 summer season, and first went south to Antarctica as a Queen's Scout in 1964. David is a lawyer, Coroner for North Canterbury and Chairman of the Antarctic Heritage Trust.

LETTER TO THE EDITOR

Dear Madam,

I thought I should write to you about a totally incorrect article that appeared under the title heading "Laying Down the Rules for Antarctic Tourism" in Issue No. 162 of *Antarctic*. This claims that "New Zealand has published the first set of rules for operators in the Antarctic".

In fact, the first set of rules applicable to tourist activities in the Antarctic was drawn up by myself in consultation with Philip M Smith the then Head of Polar Programs, NSF, in 1966. We did so at that time due to some tourist activity in the Peninsula area during the summer of 1965/66 and our concern that such activity might spread to the Ross Sea area in the near future.

Our early concern proved well justified for we were able to present copies of this set of rules to the Holm Shipping Company and Eric-Lars Lindblad and discuss these with them prior to their first tourist cruises to the Ross Sea area in the 1967/68 season using the polar vessel *Magga Dan*. These cruises were well reported in the March 1968 issue of *Antarctic* (pages 51-54) as were our rules under the heading "Antarctic Tourists — Stringent Conditions" (Page 54).

Our set of rules prompted discussion at the Fourth Antarctic Treaty Meeting held in Santiago in 1966 and led to an appropriate Recommendation (IV-27) being made to Governments. In subsequent years both SCAR and Treaty Meetings gave attention to tourism in the Antarctic and the Sixth Consultative Meeting in 1970 considered the question under the agenda item "Effects of Tourists and Non-Government Expeditions to the Antarctic Treaty Area".

The Eighth Antarctic Treaty Meeting (Oslo 1975) gave considerable attention to tourists and private expeditions. Delegations agreed on a lengthy Recommendation to governments based on the set of rules (now Policy Statements) originally drawn up by P.M. Smith (U.S.) and myself (N.Z.). Also, this Recommendation (VIII-9) included an Annex A, being a lengthy "Statement of Accepted Principles and the Relevant Provision of the Antarctic Treaty" which was intended for the guidance of all those who visit the Antarctic. This was later printed by most countries operating in the Antarctic, including New Zealand, as their Policy Statement (or Set of Rules) on Tourism and Private Expeditions.

For the past twenty or so years this

Recommendation has been reviewed at Antarctic Treaty Meetings in light of changing circumstances but only minor modifications/additions have been found necessary. Indeed, the first set of rules referred to in Issue No. 3 of *Antarctic* does not identify any new problem areas and thus it becomes a matter of concentrating on the full implementation of those rules or policy statements that have been agreed to internationally and reviewed frequently over the past thirty years or so.

Many New Zealand and international publications have reported on tourist and private expeditions to the Antarctic back over the years to before the first tourist visited there, and on the NZ Policy Statement on Tourism and Private Expeditions. These include your own *Antarctic*, the *Antarctic Journal of the U.S.*, *Antarctic Achievements 1957-1982 (DSIR)*, *Antarctica — the Ross Sea region (Hatherton)*, *NZ & Antarctica 1983* publication by NZ Commission for the Environment, most reports and handbooks published by SCAR and the Antarctic Treaty, and many more.

Sincerely yours

Bob Thomson

MEMBERSHIP

The New Zealand Antarctic Society Inc., was formed in 1993. It comprises New Zealanders and overseas friends, many of whom have been to the Antarctic and all of whom are vitally interested in some phase of Antarctic exploration, history, development or research.

The annual subscription entitles members to: Antarctic is published each March, June, September and December. It is unique in Antarctic literature as it is the only periodical which provides regular and up to date news of the activities of all nations at work in the Antarctic and Sub-antarctic. It has a world-wide circulation.

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