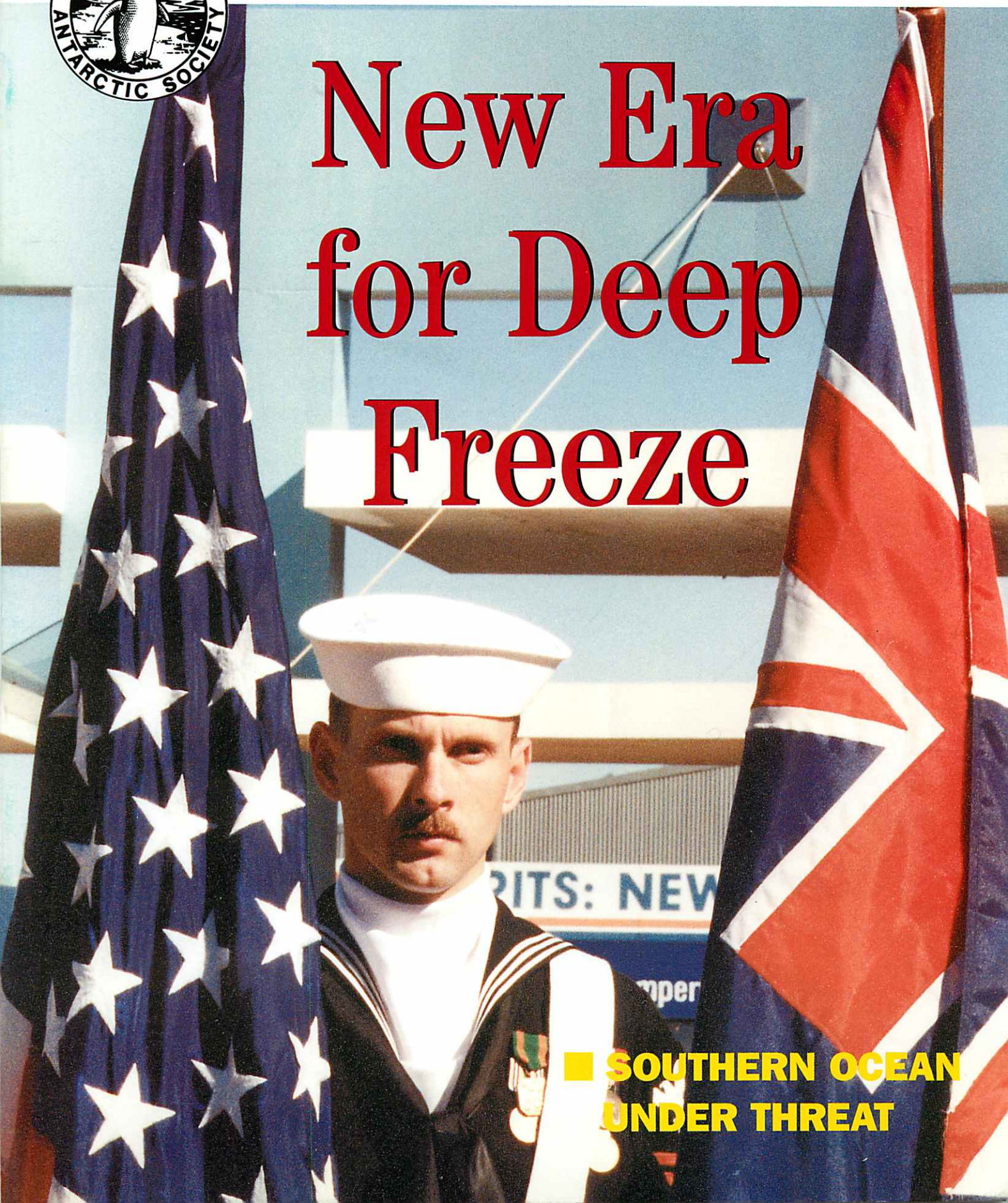
# ANTARCTIC

The Journal of the New Zealand Antarctic Society Vol 16. No. 1, 1998

# New Era for Deep Freeze

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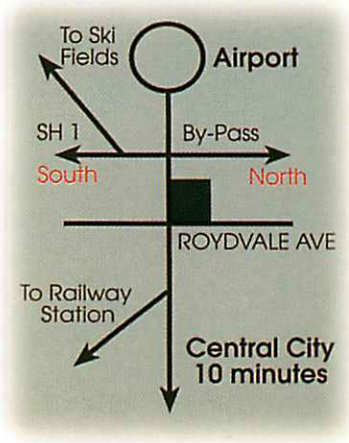


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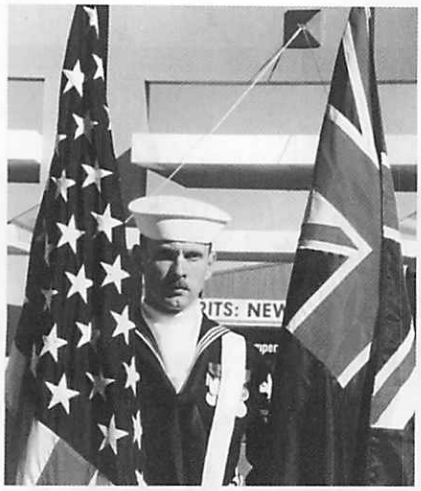
ANTARCTIC



*Cover: New Era for Deep Freeze*

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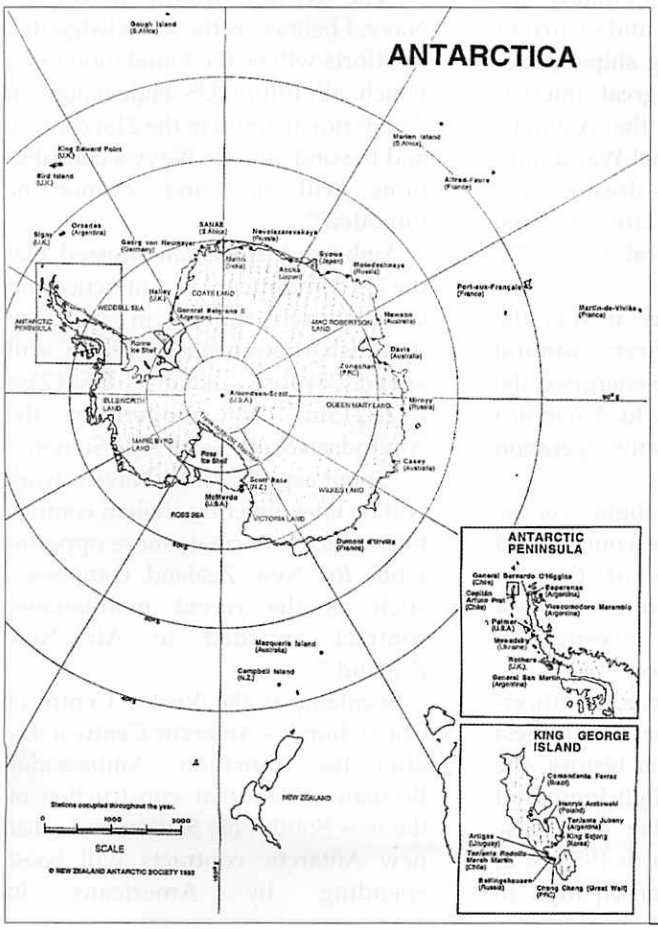


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## FORTHCOMING EVENTS

**28-30 April 1998** – Antarctic Futures Workshop, Christchurch

**14-16 May 1998** — Belgica Centennial Symposium, Brussels, Belgium.

**25 May - 5 June 1998** — First meeting of the Committee for Environmental Protection, Tromso, Norway.

**31 May 1998** — Application deadline for Antarctica New Zealand and Creative New Zealand's 1998/99 artists and media programmes.

**21 June 1998** — Exhibition of paintings by Nigel Brown at Government House. Brown was one of three artists and poets selected for last year's Artists to Antarctica Programme. The function will be hosted by the Governor General.

**29 June - 1 July 1998** — Heard Island Workshop at the Australian Antarctic Division. The workshop will review the results of previous studies and discuss the plans for future work during the 1999/2000 summer.

**20-31 July, 1998** — SCAR/COMNAP Meetings, Conception, Chile.

**5-9 July 1999** — Eight International Symposium on Antarctic Earth Sciences, Victoria University, Wellington.

# DEEP FREEZE COMMAND TO AIR GUARD

*By Warren Head*

Twenty-eight years a veteran of polar aviation, the new commander of Operation Deep Freeze, Colonel Graham Pritchard, never takes anything for granted.

"You're always careful, you always watch the weather, you watch the condition of the aircraft because it's a very different flying environment," he said when interviewed by The Press on the transition of command to the New York Air National Guard's 109th Air Mobility Wing. Col Pritchard, vice-commander of the 109th, heads the ANG's Antarctic support unit.

Canterbury skies were blue and the weather scorching in the mid-30s Celsius on the morning Col Pritchard's unit took over from the US Naval Antarctic Support Unit. Under a blazing sun over the lawns of the Antarctic Centre, 20 February 1998, NASU was disestablished in a flawless and often emotional ceremony.

American Ambassador to New Zealand, Josiah Beeman paid special tribute to the character and courage of the men and women who had served "with distinction in support of science and peace through Operation Deep Freeze over the last 42 years" and added that the US Antarctic Programme, under the stewardship of the National Science Foundation, is embarking boldly into the new millennium, renewing the US commitment to Antarctica and the city of Christchurch."

*Honour guard at the NASU disestablishment ceremony.*

Ambassador Beeman said the US Navy has made an unparalleled contribution to the peaceful pursuit of Antarctic exploration and science, starting from 1838-42 when an US Navy expedition led by Lt Charles Wilkes mapped more than 1500kms of Antarctic coastline.

Another distinguished naval officer, Lt Matthew Fontaine Maury, the first superintendent of the Naval Observatory in Washington DC was also a strong support of Antarctic exploration and science in the mid-19th century, said the Ambassador.

"Because of a lack of data in the high southern latitudes Lt Maury (the compiler of "Wind and Current Charts" used by sailing ships) advocated strongly for a great international undertaking in the Antarctic exploration. The US Civil War dampened his hopes but his dreams were realised a century later in the International Geophysical Year 1957-58."

"In the 20th century it was the consummate navy officer, Admiral Richard E Byrd, who re-energised the American commitment to Antarctica and who paved the way for Operation Deep Freeze."

Byrd piloted the first flight over the South Pole in 1929. He commanded the US naval forces of the US Antarctic Service Expedition 1939-41 "when scientific investigation assumed a prominent role."

"It was Byrd who served as officer-in-charge in 1947 for the largest Antarctica expedition in history, the US Naval Operation High Jump and who raised the US flag over base camp at Little America in 1955-56 in preparation for US participation in the IGY. . . and it was Byrd who, under the direction of President Eisenhower, helped supervise preparations for Operation Deep Freeze."


*The Deep Freeze Memorial dedicated at the NASU disestablishment to the memory of 50 Americans who have died in Antarctica during Operation Deep Freeze. The rock which bears the memorial plaque is an alluvial glacial deposit from the Bell Hill Gold Mine in the Grey River Valley, Westland. It has similar geological characteristics to Antarctica.*

"The greatest tribute to the US Navy, I believe, is the knowledge that its efforts will be the foundation upon which all future US endeavours in Antarctica are built in the 21st century and beyond...the US Navy's contributions will not and cannot be forgotten."

Ambassador Beeman stressed that the US commitment to Antarctica and Christchurch would in no way diminish, noting that the US will spend more than US$125m (NZ$215m) to modernise the Amundsen-Scott South Pole Station.

"Some aspects of the Navy's work will be taken over by civilian contractors, which will create more opportunities for New Zealand companies, such as the recent maintenance contract awarded to Air New Zealand."

Speaking at the Visitor Centre of Christchurch's Antarctic Centre a day after the transition, Ambassador Beeman added that construction of the new South Pole Station and other new Antarctic contracts will boost spending by Americans in

Christchurch. Already he noted the US spend more than US$20,000 on fresh fruit and produce each week during the Christchurch summer.

"As we approach the next century, science in Antarctica will open up our understanding of climate change, the growth of the universe and the history of our planet," said Beeman. "For over 40 years Christchurch has been our gateway to Antarctica, a home away from home and a constant friend."

He recalled that in March 1959 at a flag-raising ceremony to dedicate the headquarters of the US Antarctic programme in Christchurch, a message from Admiral George Dufek (the first commanding officer of NASU) said the dedication marked the end of one era of Antarctic exploration and the beginning of another.

Dufek's message read, said Beeman, "With the finest cooperation of the New Zealand Government and the people of Christchurch, the US Navy has been able, for the first time in history, to establish and support scientific stations in the interior of Antarctica. Now begins the new era of methodical investigation of the geophysical nature of Antarctica."

Adding his tribute to NASU and welcome for the Air National Guard, Erick Chiang, head of the Polar Research Support Section of the Office of Polar Programs, National Science Foundation said NASU and its predecessor had achieved its goals every year since 1955.

*NASU chaplain LCDR Manuel Mak; Col Graham Pritchard, vice commander 109th Airlift Wing; Erick Chiang, director of polar programmes, National Science Foundation; William Pirie Jr, Assistant Secretary of the Navy; Ambassador Josiah Beeman; Rear Admiral William Sutton, commander Naval Base Pearl Harbour; Captain Hugh Smith, commander US Naval Support Force Antarctica.*

That year the US Department of Defense named the Navy, because of its strong tradition in Antarctica exploration, as the department's executive agent there. "Exploration of the icy continent began in the midst of the Cold War and yet became a model for warm international collaborations.

"On a continent where there was no known economic value, countries competed for the privilege of establishing scientific outposts to demonstrate their commitment to discovery," said Chiang. "Who would have guessed in 1955 that the ideals and goals of the IGY would live on as they have through the Antarctic Treaty system for nearly half a century with still more discoveries to come?"

"During these many years, the US and NZ Antarctic programmes have shared common goals and have established a partnership in Antarctic affairs that made the most of what each country could offer in terms of science and logistics. NASU's presence in New Zealand helped cement that partnership with its activities that made it part of the NZ community."

"In Christchurch, the unit has become more than a name of a military presence by virtue of the fact that the sailors and soldiers have become part of the greater Canterbury community by living here and being active in community services, charities and educational outreach activities."

"With the disestablishment of NASU we mark the end of an era that started in 1929 with the then Cdr Richard Byrd. The advent of the 1955 IGY opened the continent to science that continues uninterrupted to this day.

"Following the heroic age of

*Continued on page 22*

*US Ambassador to New Zealand Josiah Beeman addresses guests at the NASU disestablishment ceremony at the Antarctic Centre, Christchurch.*

FEATURE

# FISH AND SEABIRDS THREATENED IN THE SOUTHERN OCEANS

*by Dillon Burke M.A.*
*PhD student in the Political Science Department at the University of Canterbury.*

There has been widespread illegal and unregulated fishing of the commercially valuable Patagonian toothfish in the Southern Oceans since 1996. This overfishing is seriously threatening the sustainability of the potential fishing industry. And the long-line fishing technique being used is also killing the seabird population.

The feasibility of tackling the problem is the core issue for member states of the Convention for the Conservation of Antarctic Marine Living Resources (CCAMLR). Intervention in the form of surveillance regimes has interesting implications for the unresolved sovereignty claims in Antarctica.

The Antarctic Treaty (AT) was signed in 1959 and one of its aims was the "preservation and conservation of living resources in Antarctica". There are four conventions regulating conservation and resource management in the area covered by the Antarctic Treaty and CCAMLR is one of them. The three others are: the Convention for the Conservation of Antarctic Seals, the International Convention for the Regulation of Whaling, and Annex II to the Protocol on Environmental Protection to the Antarctic Treaty: Conservation of Antarctic Flora and Fauna.

*Albatrosses killed by longline fishing in the Southern Ocean. Photo courtesy of Greenpeace*

CCAMLR's aim was to safeguard the environment and protect the ecosystem of the Southern Ocean. As conservation was defined to include rational use this would eventually allow harvesting based on scientific knowledge.

The historical pattern of resource exploitation in Antarctica is a cycle of successive discovery, overuse and depletion of each new stock. Large-scale exploitation and depletion of many fish stocks preceded CCAMLR. The depletion of finfish stocks parallelled whaling, but on a much shorter time scale, the lanternfish fishery ceased 1991/92.

The principle reason for the initiation of harvesting was that Soviet and Eastern Bloc fishing fleets were displaced from waters elsewhere; they alone were responsible for almost all fishing operations between 1969 and 1990. In the 1980s fishing in the Southern Oceans needed to be subsidised but, due to viability, this stopped during the harsher economic climate of the 1990s. In the 1990/91 season Chile started long-lining for Patagonian toothfish.

CCAMLR began in 1982 and presently has 23 members. However, the means that CCAMLR currently has to enforce conservation measures are weak and rely on voluntary compliance. Specific responsibility for imposition of penalties lies with members. A system of inspection was established in 1989/90 but fishery patrols suffer from prohibitive costs due to the remoteness of the Southern Oceans. Furthermore, all resource use suffers from the problem of biological uncertainty as, without accurate knowledge of stocks, any catch level could be too high. CCAMLR has therefore found it difficult to balance short-term economic interests with conservation needs.

Although there have been warnings of illegal and unregulated fishing in the Southern Oceans, the full scale of the problem was not realised until revealed by declassified US naval satellite photography. Unregulated fishing involves fishing outside of CCAMLR rules; illegal fishing occurs inside the Exclusive Economic Zone (EEZ) of a member nation. This 'piracy' attracted a lot of public attention at the time of the XXI Antarctic Treaty Consultative Meeting (ATCM) in Christchurch in 1997. There the danger of 'hoovering', where long-line and deep-sea trawling methods are combined to clean out the ocean, was noted.

At the centre of the current problem is the Patagonian toothfish. In the 1996/97 season the total reported catch was 32,991 tonnes. The unreported catch was estimated to be between 74,000 to 82,200 tonnes: two-thirds to Japan and one-third to the Americas. Toothfish fetches a princely sum, some $US5,000-7,000 a tonne, and Australian estimates of the total wholesale value of the illegal and unreported catch of toothfish is in the order of $A0.5 billion. The economic incentives are so attractive that it is not anticipated that the plundering of this resource will abate at any time in the immediate future.

The disturbing fact is that over half the catch is being carried out by companies and people from CCAMLR Contracting Parties, with some vessels disguising their nationality by re-flagging to non-Contracting Parties. Anywhere from 60-100 boats are thought to be involved. This has been happening because European Union vessels have been displaced from European Union waters because of fishing policy changes. The involvement of non-Contracting Parties, such as Panama, Portugal and Vanuatu, is also worrying because of the lack of means of enforcing compliance to conservation regulations among non-Contracting Parties. New Zealand's Minister of Fisheries, John Luxton, said "CCAMLR worked very well whilst no-one fished resources in the convention zone. But now it may prove to be a maginot line, outflanked by flags of convenience."

At the ATCM in May 1997 several nations vetoed formal discussion of the fishing issue because they did not feel that the ATCM was the proper place to discuss it. There was some

***Continued on page 21***

# NEWS

## FIRST ICEBREAKER IN LYTTELTON FOR 15 YEARS

The *Polar Star*, a United States icebreaker, made an unscheduled visit to Lyttelton on 1 March after towing the stricken Antarctic supply ship *MV Greenwave*. The supply ship had broken down off the coast of Antarctica after leaving the Ross Sea. The 13,190 ton, 122 metre long *USCGC Polar Star* is the first Polar Class icebreaker to visit the port. It was also the first US icebreaker in Lyttelton since the *USCGC Glacier* departed for Antarctic on 8 January 1983.


*USCGC Polar Star enters Lyttelton Harbour escorted by tugs Godley (left) and Purau. Photo by David Harrowfield*

The powerful *Polar Star* is the older of the two Polar Class ships built since 1954. It was produced by the Lockheed Shipbuilding and Construction Company and commissioned in Seattle, Washington on 17 January 1976. The sister ship the *USCGC Polar Sea* was commissioned on 23 February 1978.

*Polar Star* is able to break new hard ice up to 6.5 metres thick. The ship's three stainless steel propellers each five metres in diameter are powered by six, sixteen cylinder Alco diesel electric engines, which can produce 18,000 shaft horsepower, or three gas turbines producing 60,000 shaft horsepower. The controllable pitch propellers and powerful propulsion system are able to move the *Polar Star* at a continuous three knots through two meters of new hard ice. If caught in heavy ice, the Polar Class icebreakers are able to transfer 400 tons of water between three tanks on each side of the ship in less than a minute.

Although the ships primary duty is icebreaking, it also functions as a research ship for up to ten scientists. The *Polar Star* has a meteorological laboratory, two oceanographic laboratories and a science library.

## DUCK-BILLED DINOSAUR FOSSIL FOUND IN ANTARCTICA

A team of Argentinean and U.S. scientists has found fossils of a duck-billed dinosaur, along with remains of Antarctica's most ancient bird and an array of giant marine reptiles, on Vega Island off the eastern side of the Antarctic Peninsula.

The tooth of a duck-billed dinosaur, or hadrosaur, was found in sands about 66-67 million years old, from the Cretaceous period (about 1-2 million years before the asteroid impact that contributed to the extinction of the dinosaurs). The team that found the fossils is headed by Sergio Marenssi of the Instituto Antartico Argentino and Judd Case of St. Mary's College, California.

"This is the first duck-billed dinosaur to be found outside the Americas," said Mike Woodburne, University of California Riverside paleontologist who is part of the project. "This gives us more support for the idea of a land bridge between South America and Antarctica at that time." The land bridge was used not only by dinosaurs but probably also by marsupial mammals dispersing from the Americas to Australia via Antarctica.

The hadrosaurs are a distinctive group of American dinosaurs, known for fancy crests on their skulls with networks of passageways that may have been used for vocalization and that may suggest the animals were social. Some stood perhaps 20 feet tall.

"This find allows us to paint a much fuller picture of what life was like in Antarctica at the time," commented Scott Borg, NSF program manager for Antarctic geology and geophysics. "The climate was obviously very different when these animals lived. There must have been a lot of vegetation to support these large plant eaters. The find implies a complicated and robust ecosystem."

The region around Vega Island is extremely rich in both terrestrial and marine fossils, and the only such fossil trove in Antarctica to span the boundary of the Cretaceous and Tertiary periods, the time when the dinosaurs were wiped out.

The team also recovered a four-centimetre-long piece of a foot bone from what appears to be Antarctica's most ancient bird yet found. Also collected were numerous partial skeletons of gigantic marine reptiles called plesiosaurs and mosasaurs. According to James Martin, a South Dakota School of Mines paleontologist on the dig, these specimens included several juveniles which are very rare in the fossil record.

The group of palaeontologists also includes members from the Smithsonian Institution and Argentina's Museo de la Plata.

### HERITAGE ANTARCTICA LAUNCHES ON THE NET

To reflect its important international outlook, New Zealand's Antarctic Heritage Trust is joining forces with UKAHT under the banner of *Heritage Antarctica*. Celebrating this will be the launch of their new web site at http://www.heritage-antarctica.org.

## RARE CATERPILLAR RETIRES

The last remaining prototype of only three experimental dozers built by Caterpillar for the American National Science Foundation in 1964 was recently donated to the Otago Vintage Machinery Club.

The machine was brought to Lyttelton by container ship from Antarctica where it has spent most of its 36-year life working on the ice. The 13 tonne machine was used to build and repair snow roads in Antarctica and to tow sledges to field stations on field trips.

With its double width tracks and elongated chassis, the dozer was able to ride over the top of deep snow and tow as much as 14 tonnes of cargo. Unfortunately the experiment was not successful as the machine developed a bad habit of breaking its rear axles when turning.

Before retiring at the club's museum at Outram, the dozer was put on show at Forbury Park in March during the 150th Otago and Southland anniversary commemorations.

## AUCKLAND ISLANDS REOPENED

Access to parts of the sub-Antarctic Auckland Islands has been reopened after the mysterious sealion deaths earlier this year.

Conservation Minister Nick Smith said that while the cause of the mass deaths was unknown he had been advised by scientists the risk to human health was minimal.

Conditions for visitors include the continued closure of the main breeding grounds on the tiny offshore islands of Dundas, Enderby, and Figure of Eight, where most of the deaths occurred.

Department of Conservation marine mammal expert Mike Donoghue said a DOC team estimated about 1800, or 60% of this year's New Zealand sealion pups had died, and probably 20% of the adult population.

He said the loss of adult females could not be estimated with confidence until at least the next breeding season in December, and possibly until three years of pup production had been monitored.

Donoghue said the Ministry of Agriculture's chief veterinarian had declared the unknown agent killing the sea lions to be an "exotic organism".

That meant the samples sent to Massey University for analysis could not be moved out of Palmerston North until preliminary tests had been done.

Other laboratories around the country are expected to do specialist testing.

He said there were three possible causes of the deaths — a virus, a bacterium, or a toxic algal bloom. He would not speculate on the most likely cause.

Mass deaths of sea creatures had been reported in Chile, Venezuela, Peru and South Africa.

If the deaths were caused by a virus the only remedy would be a vaccine, which could take years to develop.

If a bacteria was responsible, scientists would have to decide which antibiotic to use and then they would struggle to administer it.

## TECHNOLOGICAL TEST ON SEA BED

National Space and Aeronautics Administration scientists will test state-of-the-art "telepresence" technology, which may be used to explore Mars, on the sea floor near McMurdo Station in Antarctica.

A scientist at Nasa's Ames Research Centre in California, Dr Carol Stoker, said both areas were remote with hostile environments difficult for humans to explore, but capable of being explored by sophisticated robots.

Scientists would use a modified submarine called a telepresence remotely operated vehicle to explore 300m below the surface of McMurdo Sound near Ross Island.

Telepresence technology allows scientists on land to use head movements to point cameras on the underwater vehicle and steer by remote control, from thousands of kilometres away if necessary.

Scientists will be able to steer the vehicle from adjacent land in McMurdo Station and from as far away as California.

The TROV is directed by a computer, both directly and by linking it to a virtual-reality underwater terrain model.

It is attached to a 330m tether, including fibre-optic cables, which sends digital data and video signals to the surface. The signals are combined into stereo imagery which scientists can view using special "stereo glasses".

A researcher at Monterey Bay Aquarium Research Institute, James Barry, will use the TROV to plot how dominant bottom-dwelling life forms change from shallow to deep water in McMurdo Sound.

### LOTTERY GRANT HELPS TRUST

The NZ Lottery Grants Board provided a substantial grant to the Antarctic Heritage Trust to purchase much needed computer equipment. The equipment was installed in time to support last summers work programme with an improved database. The Trust is now able to manage its artefact inventory and conversation programme more effectively.

## GIANT ICE SHELF MELTING IN EASTERN ANTARCTIC

British scientists warn that a giant Antarctic ice sheet more than 160km across is breaking up because of a rapid rise in climate temperature.

The sheet is so large it could disrupt the Gulf Stream, the warm current of water which flows north from the mid-Atlantic to the west British coast, experts, including the British Antarctic Survey, report.

They say that the Larsen B ice shelf on the eastern side of the frozen continent will eventually disintegrate. It is described as "critically unstable" and, unless the retreat of the ice halts, is expected to collapse over the next two years.

A total of 13,000 sq.km of ice in the region has so far disappeared due to atmospheric warming, but the Larsen is the biggest so far. Temperatures around the icecap are rising five times faster than the global average and signs of warming are evident all around the coast, with grass growing in areas once too cold to support it.

Five ice shelves on the Antarctic Peninsula have collapsed due to regional warming (2.5°C in last 50 years). The rate of warming on the Antarctic Peninsula is rapid but not matched elsewhere in Antarctica. At 12000 km2 the Larsen Ice Shelf B is four times larger than Larsen A that collapsed in 1995. As it is already floating the disintegration of Larsen B will have no impact on sea level. Sea level will rise only if the ice held back by the ice shelf flows more quickly onto the sea. So far around 5000 km2 of ice shelf have been lost from the Antarctic Peninsula. This is 0.3% of total ice shelves around Antarctica.

BAS conducts a number of diverse research projects on Antarctic ice sheets. Details of which can be found on the British Antarctic Survey website: http://www.nerc-bas.ac.uk/

## BOOKS WHERE EXPLORERS ONCE ROOMED

A building which once served as Captain Robert Scott's headquarters is now being used by Middleton Grange School in Christchurch.

The revamped Middleton Grange Historic House, built on to Thomas Rowley's original 1866 cob cottage, has been formally opened as the junior school's new library.

It once stood on a large spread of farmland as the Rowley homestead, and was Captain Scott's headquarters before his 1901-04 Antarctic expedition. Fellow explorers Ernest Shackleton and Edward Wilson joined Captain Scott there.

The building became a home for education when the Christian Schools Trust bought the property in 1963. A senior architect for Opus International Consulting, Malcolm McClurg, said it was an excellent example of finding a new use for, and saving, a historic building.

The Christchurch City Council's heritage building fund provided $15,000 for the project.

The old mud and straw walls have been strengthened with steel frames, and steel pins hold the walls in place.

Rotting wood, mould, and a leaking roof had been replaced, or fixed at a cost of about $220,000.

The building had served as two classrooms, but became so dilapidated that it was later used for storage and was largely ignored. Now it was the school centrepiece, Mr McClurg said.

## BIGGEST QUAKE THIS YEAR ROCKS ANTARCTICA

The biggest earthquake in the world so far this year, measuring 8.1 on the Richter scale, was recorded on 25 March, 1998 at 3.11pm NZT in Australia's Antarctic Territory, just off the Balleny Islands about 2000km south of New Zealand.

Seismologist Dr Ken Gledhill of the Institute Geological and Nuclear Science said, "This is a big, big earthquake — slightly bigger than the 1858 Wairarapa quake that caused sideways movement in the ground of 12m and an uplift of about 6m. It was also larger than the earthquake that struck Napier in 1931 that measured 7.9 on the Richter scale."

Nothing was known about how much damage it would have caused to the physical environment in the quake's impact area but, according to Dr Gledhill, it would have broken a lot of earth.

Had it happened near urban populations the quake would have caused a major disaster. The quake that struck the Japanese city of Kobe in January 1995, killing about 6000 people and injuring 35,000, was 7.2 on the Richter scale.

## US SENATORS PASS THROUGH CHRISTCHURCH

United States senators, led by Senate Committee on Appropriations chairman Ted Stevens, visited Antarctica in January.

The delegation made a five-day visit to discuss regional issues, including security and trade, and to visit and assess the US Antarctic Research Programme conducted by the National Science Foundation.

They visited the McMurdo and South Pole stations. The group met Foreign Affairs Minister Don McKinnon, Fisheries Minister John Luxton and Defence Minister Max Bradford.

## VICE-REGAL ICE VISIT

The Governor-General, Sir Michael Hardie Boys, and Lady Hardie Boys visited Antarctica in January.

They met scientists at Scott Base, visited glaciologists in the dry valleys, and New Zealand biologists at Bratina Islands on the ice shelf 50km from Scott Base, and visited McMurdo Station.

The party included MP Paul East, and Antarctica New Zealand board chairman Chris Mace.

## HUT PROJECT UNDERWAY

Experts selected to conserve the historic hut built and used by Sir Douglas Mawson in the Antarctic in remote Commonwealth Bay have undertaken a 51-day project.

A party of two women and 11 men as well as two documentary film-makers sailed into Commonwealth Bay on board the *Akademik Shokalskiy*. The conservation team is carrying out a detailed conservation programme on the hut, which marks the spot where Australia's Antarctic heritage began.

# BELGIAN EXPLORERS CELEBRATE 100 YEARS OF BELGIAN POLAR EXPLORATION

Using parafoils to achieve speeds of up to 45km per hour, Belgians Dixie Dansercoer, 35, and Alain Hubert, 44, succeeded in crossing Antarctica in just 98 days. They arrived in Christchurch in February 1998 having crossed the ice continent from the site of the former King Baudouin base to the American base at McMurdo via the South Pole. With some favourable conditions the pair sailed 3340km of the 3,924 journey — half of which was achieved in just 23 days at an average speed of 80.8 km per day.

*Right: Alain Hubert (left) and Dixie Dansercoer in David Harrowfield's "Polar Room", Christchurch 17 February 1998. Photo by D. Harrowfield*

# ANTARCTICA MAKES THE LITERARY MAP

*By Jennifer Little of AFP*

Two New Zealand poets and a painter, recently back from Antarctica, found no shortage of inspiration in the ice and snow where they felt time itself was frozen along with the landscape.

The impressions of New Zealand's poet laureate Bill Manhire, along with those of fellow poet Chris Orsman and painter Nigel Brown, have been collected in a book entitled *Homelight*. The book is named after special oil lamps used by the ill-fated British Antarctic explorer Robert Falcon Scott early this century.

The 23 hand-sewn copies, with drawings and a woodcut cover by Brown, are to be sold initially to libraries in New Zealand, with a second edition to be launched later this year.

More material will be made available through Manhire who hopes to publish his field notes on the journey, which came about through Antarctica New Zealand's inaugural Artists to Antarctica scheme. Their brief was to observe the icy wastes with an artist's sensibility and to share their impressions of a place that few will ever see.

They spent two weeks in January during Antarctica's late summer, when the sun constantly hovers above the horizon. "This made it slightly moon-like. It felt like you might be on another planet," said Manhire.

The men camped for four nights beside the frozen Lake Bonney, where they worked and slept in five layers of clothing to defy average temperatures of minus 18 degrees Celsius. The only sounds they heard were the creaking and grinding of the glaciers. And perpetual wind, which hindered Brown in his attempts to paint using an easel. He finally gave up when the wind had toppled the easel for the umpteenth time and painted lying down with a boulder to hold the canvas in place.

As Manhire observed, nothing grows, nothing decays and there is no smell. It is as if time itself is frozen. The most poignant evidence of this was during a visit to Scott's Hut at Cape Evans, which the British explorer and four companions used for their second expedition to Antarctica from 1910 to 1912. It ended in disaster with all five perishing.

"You felt they'd just walked out the door," Manhire recalls. "There were jars of preserved cabbage, parsnips and other foods." In the stable attached to Scott's hut were sides of seal carcasses stacked up with blubber still oozing more than 90 years on. And no smell.

Keen to see the South Pole, Manhire endured a three-hour flight aboard an American Hercules from Scott Base to spend 45 minutes on the ground at the end of the world. Describing it as a very "marginal, paradoxical place" where any direction you walk is north, he confessed to being "quite bothered"' by the experience.

Manhire plans to publish an international anthology of writing on Antarctica in October.

**Ed** — The following poem composed on the ice was kindly provided to *'Antarctic'* by Bill Manhire. Bill explained that this poem was composed mostly out of entries in the comments column of the Visitors' Book in Shackleton's hut at Cape Royds.

## VISITING MR SHACKLETON

*for Chris Cochran*

Cool! Wow! Beautiful!
Awesome!
Like going back in time.
Amazing! Historic! Finally
I am truly blessed.

Wow! History! Fantastic!
Wonderfully kept.
Shackleton's the man!
Like going back in time.

Wow! Cool! Historic! Yo!
Awesome! Privileged. Unreal!
And Thank you, God.
And Happy Birthday,
Dad. And Thailand.

*By Bill Manhire*

# NATIONAL PROGRAMMES

## NEW ZEALAND

### KEY SPEAKERS AT WORKSHOP

Antarctica New Zealand's Future Workshop, being held 28-30 April 1998, has attracted some leading international and national speakers.

"The Workshop would be a significant forum for discussing the future of Antarctic in a time of change for the icy continent", says spokesman Tim Higham. "Already fishing fleets from around the world are targeting Antarctica's fish stocks and exponential growth in visitors to the region is unlikely to slow."

The Workshop is one of a number of sector group initiatives feeding into the Ministry of Research, Science and Technology's Foresight Project aimed at setting priorities and investment strategies in the future.

Its aim is to explore the trends, scenarios and opportunities emerging around Antarctic and the kinds of values needed to underpin New Zealand's policy in the region.

Keynote and panel speakers include: former Prime Minister, David Lange; Hugh Logan, Director General of the Department of Conservation; Stuart Prior, Antarctic Policy Unit, Ministry of Foreign Affairs and Trade; director of the Adventure Networks International and Polar Logistics companies, Anne Kershaw; Chairman of Greenpeace New Zealand, Roger Wilson; author of the recently published Geophysics in Antarctica — Views from the Southern Oceanic Rim, Klaus Dodds; and chief executive of the Ministry of Research, Science and Technology, James Buwalda.

### RESEARCH IN NORTHERN VICTORIA LAND

A science strategy development process has prompted Antarctica New Zealand to investigating the feasibility of using a small relocatable facility and associated transport to support research in Northern Victoria Land.

The agency is seeking expressions of interest for research that focuses on climate and environmental change indicators; or latitudinal variation in biological adaptations and systems; or geological evolution and break-up of the Gondwana supercontinent.

International partnerships are being sought for the initiative and it is hoped that the facility will be operational in the 2000/01 summer season.

### ARTISTS TO THE ICE

Creative New Zealand and Antarctica New Zealand will be offering two artists selected for the Artists to Antarctica Programme $10,000 each from next year. The grants will cover travel and material costs and enable the artists to devote time to their creative work on return to New Zealand.

The first inaugural artists' visit last season resulted in a slim volume of poetry and sketches called *Homelight* by Bill Manhire, Chris Orsman and Nigel Brown. It was produced at Scott Base and launched as a fax edition by Pemmican Press at Victoria University on April 6. Nigel Brown's paintings will be exhibited at a function hosted by the Governor-General at Government House on June 21. Applications for the 1998/99 artists and media programmes close on May 31.

### ENVIRONMENTAL MANAGEMENT STRATEGY

An Environmental Management Strategy has recently been released by Antarctica New Zealand for activities in Antarctica over the next 3-5 years. The strategy puts forward an approach to managing environmental and human activities in Antarctica that balances the benefits of access with the need for environmental protection. Initiatives include a Ross Sea Region State of the Environment Report, work on an environmental database for field activities and development of an environmental monitoring programme. An Environmental Advisory Group has been established to provide expert advice on key environmental initiatives. Copies of the document are available from the Antarctica New Zealand library.

### SCHOLARSHIPS AWARDED

The 1998 Post Graduate Antarctic Scholarships of $10,000 each have been won by doctorate students from Massey, Auckland and Otago Universities. New Zealand Post scholar, Peter Richie of Massey, will look at whether poultry virus is present in Ross Island penguin colonies; Telecom Payphones scholar, Paul Bond of Otago, will model the properties of cracks in sea ice; and Kelly Tarlton's scholar, Guy Carton of Auckland, will explore the physiology of sensory systems in Antarctic fish.

### SCOTT BASE RENOVATION

Scott Base's Q Hut is being completely stripped and refitted this winter at a cost of $370,000. The project will help increase bed space and provide an expanded library and quiet work areas for scientists. A new $130,000 double-skinned fuel tank, built by Christchurch company Campion and Irving, was transported to the base on the resupply ship *Greenwave* in January and will be installed early next season.

### SA & NZ JOINT RESEARCH

Planned collaborative South Africa / New Zealand research in the Southern Ocean and Ross Sea in early 1999 using the South African ship *Agulhus* is now being reviewed due to the unavailability of the icebreaker. The National Institute of Air and Water (NIWA), the lead New Zealand science agency in the project, is investigating the possibility of using other research vessels. The research work will focus on an *in situ* iron fertilisation experiment to test the hypothesis that lack of iron limits phytoplankton production in the Southern Ocean.

# CANADA

## FIRST RADAR IMAGES OF ANTARCTICA COMPLETE

During October last year a RADARSAT mapping project accomplished the first complete radar image coverage of Antarctica. The stunning imagery is being transformed into a mosaic map of the continent. Scientists are also studying the imagery to extract information about ice-flow, geological structures and other details. To make it possible to identify changes to the ice sheet a repeat coverage of area will be obtained in two years time.

You can see the images at http://radarsat.space.gc.ca/eng/amm/menu.html.

## COUPLE TO CROSS ANTARCTICA AT THE MILLENNIUM

Canadian polar explorers Laurie Dexter and Synniva Sorby plan to become the first male-female team to ski across Antarctica. Starting from Brekner Island, the pair plan to arrive at the South Pole on New Year's Day, 2000, and continue on to McMurdo Sound.

Dexter, of Fort Smith, Northern West Territory, is a veteran of the Polar Bridge Expedition that crossed the Arctic Ocean in 1988. Sorby, of Los Angeles, was born in Norway, grew up in Montreal and graduated from Bishop's University were she was a prominent member of the ski team. She was a member of the Women's Antarctic Team that skied to the South Pole in 1992-93.

## CANADA APPLIES FOR FULL SCAR MEMBERSHIP

According a recent newsletter for the Canadian Antarctic Research Network, Canada is prepared to assume a higher and more active profile in Antarctica. As a clear signal to others in the Antarctic scientific community Canada has submitted a formal application for full membership of the Scientific Committee on Antarctic Research (SCAR).

A new Canadian Committee on Antarctic Research (CCAR) will be established to provide a framework for wider participation in Antarctic science.

The Canadian Polar Commission will ensure that resources necessary to support the research activities will understand the significance of Antarctic science by stressing the value of bipolar studies and the need for a sound scientific basis for implementing the Environmental Protocol.

# CHILE

## BUSY PROGRAMME OF SCIENCE EXPEDITIONS

During the summer season of 1997/98 Chile's 34th Antarctic science expedition comprised some 15 projects of the National Programme of Antarctic Science and Technology Studies. These included:

Cartography and GIS in the South Shetlands; Base marine science at Arturo Prat in Bahia Chile; Glaciology at Patriot Hills, Geodynamics of volcanic processes in Paulet Island and Tabarin Peninsula; Ecology of seals at Cape Shirreff; Neutron monitoring in the Fildes Peninsula; Ecology of Penguins at Ardley Peninsula and Bahia Paraiso; "Telemedicine" at Fildes Peninsula; Volcanism and low grade metamorphism in Byers Peninsula; Antarctic foraminifer in Bahias Chile, Fildes and Foster; Peninsula metamorphic complex at Smith I., False Bay and Spring Point; Tectonics of South America and Antarctica in King George, Greenwich, Elephant and Deception and Smith Islands; Chemical changes in the Atmosphere in Fildes Peninsula; Mesozoic-Cenozoic Paleofloras in Livingston & Low Is, Fildes Peninsula; and a study of the Nth American-Chilean co-operation in Antarctica 1939-1949.

Other activities included: establishing satellite antennae; GPS mapping programme; ecology of the Albatross; dynamic processes in Antarctic geosystems; identification of sea-ice from satellite radar images; Austral Telemedicine network; and the feeding of whales.

Chile's logistical support is provided by the Air Force and the Navy. Air support comprises a Hercules C130 from Punta Arenas to King George I (2.5 hours) and a Twin Otter to Patriot Hills. The naval support ship is the 450 ton, 42.5m charter of *"Isaza"* which travels at a maximum speed of 15 knots. The ship can carry thirty passengers and three Zodiacs. There are no science facilities onboard as the ship is usually used for coastal patrol fishery and servicing navigation aids in Patagonia archipelago.

Chile's three permanent bases are: *Arturo Prat* on Greenwich Island, *O'Higgens* at Cape Legoupil on the Antarctic Peninsula and the *Marsh/Frei/Escudero* complex on King George Island.

Additionally seven summer bases were established: *Videla* at Bahia Paraiso: *Risopatron* on Robert Island, *Ripamonti* at Rey Jorge Island, *Carvajal* on Adelaide Island, *Yelcho* in the Palmer Archipelago at Doumer Island, *Shirreff* at Livingston Island and *Patriot Hills* in the Ellsworth Mountains.

## BRITAIN

# LOOKING FOR LIFE IN LAKE VOSTOK

Scientists from America, Russia, United Kingdom, France, Germany and Japan met in Russia in March 1998 to develop a programme to investigate the lake discovered beneath the ice at Vostok, the Russian Antarctic research station.

The presence of water under the Antarctic ice sheet was first recognised during the 1970's. Recent satellite radar altimetry studies revealed the existence of an exceptionally large lake (roughly 224 km x 48 km in area, 484 m deep) beneath more than 4 km of ice sheet.

In 1996 geophysical studies revealed the scale of Lake Vostok and ice-core drilling was stopped at around 100 metres above it while scientists worked out procedures to sample the lake whilst keeping it pristine. Thought to be roughly the size of Lake Ontario, Lake Vostok, is the largest of over 70 sub-glacial lakes in Antarctica that occur close to ice divides.

British Antarctic Survey lake microbiologist, Dr Cynan Ellis-Evans, said "The programmes' broad objectives are to penetrate the ice-sheet, monitor the lake environment and establish the presence and nature of life-forms in the lake. The purpose of the meeting is to outline current understanding of Lake Vostok and its overlying ice sheet, based on glaciological and geophysical data. Scientists speculated on possible life existing within the lake using existing knowledge of polar lake and marine environments.

The discussions focussed on technologies for penetrating the 4 km thick ice sheet and placing equipment in the lake without compromising its pristine status. The need for rigorous protocols and crosschecks to avoid contamination of this unique environment is a central feature of proposed mission planning.

A series of recommendations were developed regarding the scientific objectives and technological requirements needed to investigate Lake Vostok.

(The origin of these lakes is still a subject of discussion. The most likely scenario is that the lakes developed after the ice sheet had reached its present thickness and that the lakes have always been sealed from the atmosphere. Estimates of the age of Lake Vostok range from hundreds of thousands to millions of years. The sediments represent an entirely unique opportunity to obtain subglacial rock specimens from the interior of the continent. The lake is arguably the most isolated aquatic environment on Earth and may well contain unique micro-organisms and bio-molecules.

Microbiological studies of cores from the 3800 m long ice coring project at Vostok have isolated viable micro-organisms up to 200,000 years old and similar biota may have "seeded" the lake. The long time scales of isolation and the extreme environment will have a major impact on the survival and evolution of lake biota and may be reflected in physiological/biochemical adaptations. American exobiologists also see an analogy between the environment of Lake Vostok and a possible aquatic environment beneath the ice sheet on Europa, one of the moons of Jupiter. NASA has hopes of eventually sending a robot probe to Europa and have recently taken a significant interest in Lake Vostok. Staff from the NASA Jet Propulsion Laboratory, Pasadena, are now actively involved in planning a Vostok penetration mission for around 2001 and will be represented at the workshop by project leaders Dr Frank Carsey, an earth scientist, and engineer, Dr Joan Horvath.)

## ITALY

# THE ITALIAN ANTARCTIC SCIENCE PROGRAMME

Italy may be a relative newcomer to the Antarctic but has steadily increased its presence on the ice and with it the scope of its scientific research programme.

This year marks the 13th summer on Antarctica, having first ventured to the ice in 1985/86 when the National Agency for New Technologies, Energy and the Environment in Italy established its seasonal base at Terra Nova Bay in North Victoria land on the eastern edge of the Ross Sea. Italy signed the Antarctic Treaty in 1991.

The Italian government has committed significant funding into its Antarctic scientific research programme, appropriating the equivalent of $US190m for the six years to the end of 1991 period and a further $US325m for the 1991/96 period.

The Italian base is operative from mid October to late February or early March with upwards of 60 scientific personnel living at the base at any one time during the summer season. During the season up to 250 personnel pass through the base. They are drawn from throughout Italy including staff from some of the country's leading universities.

The base site covers 3600sq m. of which 1000 sq m. is devoted to research laboratories, accommodation and ancillary facilities for personnel. Staff are backed up with an extensive array of equipment including a 15 metre research boat, four smaller inflatable boats, skidoos, all terrain vehicles cranes and tractors.

Logistical support is provided by both sea and air links with New Zealand and Italy. At the beginning of each season a support vessel sails from Italy via the Suez Canal and Port of Lyttelton with the bulk of supplies needed for the season's research programme. Air support is provided by the Italian Air force which flies C-130 Hercules to the base from Christchurch using an ice runway formed on thick pack ice in part of Terra Nova Bay. The air strip is also occasionally used by United States and Royal New Zealand

Air force aircraft as a back up when the weather closes the American operated ice runway on the Ross Ice Shelf.

The Italian base undertakes a wide range of scientific research projects. These include oceanographic studies, volcanology, geology, glaciology, marine biology, the impact of global climatic phenomena on the Antarctic and meteorites - more than 250 of which have been discovered and classified over the past 13 years.

Aside from the physical aspects of the Antarctic environment, Italian scientists have been conducting experiments on the effect of medicines in the Antarctic environment and the reaction of the human body on climatic changes.

Bob O'Brien of the Lyttelton Shipping Agency Ltd acts agent for the Italian Antarctic programme in Christchurch. He says the Italians, like other countries on the ice operating out of Christchurch, spend considerable sums of money with local businesses. "The Italians buy supplies from between 30 and 40 businesses in the city spending between $1.5m and $2m each summer season."

Food, building and plastic materials, communications and electronic equipment, plastic materials and up to 600,000 litres of jet fuel are all required by the Italians during their four months on the ice. The local hospitality industry also benefits, he says, with several hundred bed nights generated by the Italian Antarctic operation.

The Italians also hire two or three helicopters each season currently supplied by Helicopters New Zealand of Nelson.

*Extract from Canterbury Business Monthly*

## UNITED STATES

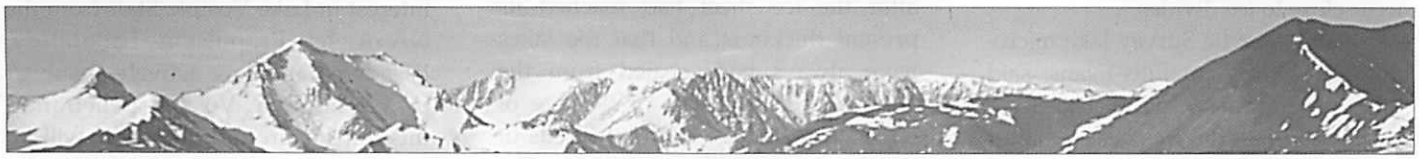
### OLDEST CRAYFISH FOSSILS DISCOVERED

New evidence discovered during an NSF funded expedition in the Shackleton Glacier area last season shows that freshwater crayfish evolved 65 million years earlier than previously thought.

US researchers discovered crayfish burrows in 240 million year old deposits of the Triassic period. They identified a 285 year old fossil crayfish claw — the oldest known evidence of decapod crustaceans from freshwater deposits anywhere on earth.

Scientists have long speculated that decapod crustaceans invaded freshwater stream and lake systems before the end of the Palaeozoic era, but had no direct evidence until now.

# TOURISM



## TOURISM ON THE UP

***"The unique attractions of the Ross Dependency mean demand for opportunities for visitors to access this region will continue to grow," says Tim Higham, Communications Manager of Antarctica New Zealand.***

Last year about 10,000 tourists visited Antarctica last year, almost exclusively by ship. These anchored offshore with visitors transferring to land by Zodiac inflatable boats. Of those tourists between 500 and 1000 people visit the Ross Sea area where New Zealand's Antarctic operations are based. In addition there are 2000 to 3000 scientific and support staff that are active in the region during summer. The Ross Sea area offers a diverse range of attractions for visitors, says Tim Higham, Communications Manager, Antarctica New Zealand.

"There is the stunning scenery including the Ross Ice Shelf, Mt Erebus and the Dry Valleys — the largest ice free areas on the continent as well as the original huts left behind by explorers Shackleton and Scott. The huts are absolutely unique as they are exactly the same as they were when they were built almost 90 years ago."

Lyttelton is already benefiting from Antarctic tourism with three ships using the port including the Marco Polo, which can carry up to 500 passengers. Christchurch based Heritage Expeditions has already successfully broken into this market.

The rate of expansion is handicapped at present by the difficulties getting to the Antarctic which include the lack of suitable ships, the high costs and rough weather.

"Developments are also occurring in airborne tourism with overflights of the Ross Dependency operating from Australia and New Zealand could re-enter that market," said Higham. "In the longer term it is possible commercial aircraft could be able to land on the ice runways presently only used by military transport aircraft. Christchurch, as long standing aviation gateway to the Antarctic, is well placed to take advantage of these opportunities as they develop."

*Extract from Canterbury Business Monthly*

### INTERACTIVE DISPLAY A HIT FOR VISITORS

Scott Base winter science technician Hermione Binnie is providing regular photo and diary entries for a popular display in the International Antarctic Visitors centre. Digital images and text is being emailed to the centre and displayed on an interactive monitor. Richard Benton, manager of the Centre, said personal, daily contact with the base is proving a big hit with visitors to the attraction.

FEATURE

# 40 YEARS AGO

## DREAM OF ANTARCTIC CROSSING FINALLY FULFILLED

By Margaret Bradshaw - final instalment

Arrival at the South Pole 4 January 1958, marked the end of the New Zealand expeditions. The tractor party — Ed Hillary, Derrick Wright, Jim Bates and Murray Ellis — were flown back to Scott Base, while Peter Mulgrew remained at the Pole to relay radio messages between Vivian Fuchs's Crossing Party and Scott Base.

The sledging expeditions, however, were far from finished. North of the Mulock Glacier the Northern party had investigated Escalade Peak and had moved further west to survey the Boomerang Range (see photo, page 93 previous issue), returning to their depot in the Lashly Mountains on 14 January. For the next week they made geological examinations and established survey stations on many of the peaks at the head of the Ferrar Glacier.

At this point Murray Douglas and Guyon Warren were flown out to catch the *USS Grenville Victory* back to New Zealand, but Bernie Gunn and Richard Brooke decided to put in a further survey station on Pivot Peak and then to climb Mt Huggins in the Royal Society Range.

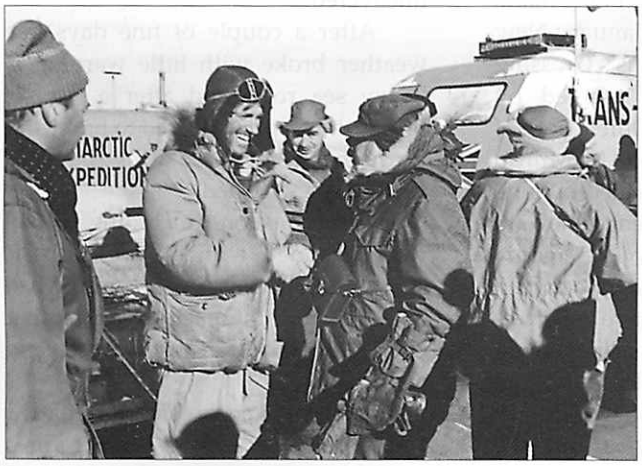
When the surveying was finished, and with a dog team each, Gunn and Brooke sledged down the Skelton Glacier to "Stepaside Spur" then ascended the Trench Glacier as high as they could before the snow became too soft.

*Above: The Darwin Party before being flown out to Scott Base. Left to right: Roy Carlyon, Selwyn Bucknell, Harry Ayres and Bill Cranfield. Photo: Courtesy of Jean Ayres.*

On 25 January they left the dogs, and carrying a tent and food for two nights ascended Mt Huggins. The climb took two long days, but they were disappointed to find cloud prevented a good view towards Ross Island. Returning to the sledges they discovered that four of the dogs had managed to get off the line.

After three days confined to their tent by snow and poor visibility, the two men felt compelled to move as they were running short of food. Finding their earlier depot with some difficulty, they then continued to descend the Skelton Glacier, where bamboo marker poles indicated that 1.5m of snow had accumulated on the glacier since the last season.

Gunn and Brooke were flown out from Skelton Depot on 6 February, ending an extremely valuable Northern reconnaissance expedition that covered 32,000 sq km of complex topography, and produced the first comprehensive geological description of the area.



*Below left: Sir Edmund Hillary is greeted by American well-wishers after the arrival of the Crossing Party at Scott Base. Photo: Antarctica New Zealand Archives.*

The Darwin and Southern Parties were also accomplishing great things. On 7 January Harry Ayres and Roy Carlyon left Haven Nunatak and travelled south to Mt Henderson in the Britannia Range (see photo, page 92 previous issue). That night they heard that most of Hillary's party were back at base, that a British twin Otter had made the first single-engine trans-Antarctic flight from South Ice to Scott Base over the Pole, and that the Crossing Party was within 450 km of the Pole.

After completing a survey station on Mt Henderson, they continued southwards to put a final one in near Mt McClintock overlooking the fast-moving Byrd Glacier. The dogs were becoming increasingly distressed by slab subsidence, which Carlyon described: "During the day I was in the middle of a large subsidence which I heard roaring towards me before it reached the sledge and then roared off into the distance until I could hear it no longer. This subsidence must have involved tens or even hundreds of acres of snow surface."

The two men returned to Westhaven Nunatak to await the

arrival by plane of Selwyn Bucknell and Bill Cranfield for the journey down the Darwin Glacier.

Ayres and Carlyon had been five weeks without human contact, the longest period of any of the TAE field parties. Now with four in the party, they sledged steadily down the glacier without incident, Carlyon taking a round of measurements at the confluence with the Hatherton Glacier.

They encountered blue ice near the bottom of the Darwin Glacier where the summer thaw had produced melt streams up to 1.2 metres deep and sharp ice ridges that the dogs did not like. Time was now the essence as Cranfield wanted to catch the *Greenville Victory* back to New Zealand. At the mouth of the glacier they had a problem locating Darwin Depot in fog and were forced to camp until it cleared. On 22 January the Beaver flew in to take them back to Scott Base. Another major reconnaissance expedition covering a huge area of newly surveyed country had come to an end.

Exploring the Marsh Glacier and Queen Elizabeth Range, Bob Miller and George Marsh in the Southern Party struggled with poor weather and dogs that panicked easily (in "all directions") after snow subsidence. With only 10 days left before having to return to Depot 700, they discovered the Law Glacier but were unable to descend it to cross to the Queen Alexandra Range.

They established their penultimate survey station in such miserable conditions that it became necessary to pitch the tent and light a primus so that each man could warm up between successive trips outside to complete the round of sights. The weather continued windy and cold, and after one last numbing survey station, they turned their faces back towards Depot 700.

Time was tight with barely enough days to get back to the depot in time for the flight on 16 January. Supplies from their Christmas Depot, part way back, were now urgently needed, but on the day they were due to arrive there it was blowing a blizzard with poor visibility. Fortunately the cairn they had left at the depot was 4 metres high or they might have missed it altogether. They kept to schedule by travelling 50km in 10 hours the day before they were due to arrive at the depot. When the time came, however, there was no sign of the depot.

The topography around was not at all familiar and undulations gave them a horizon of less than 3km. Only by repeatedly using their sun compass did they eventually locate the depot, demonstrating how easy it is to get lost on the Polar Plateau. They packed the numerous rock samples they had collected, wrote letters, and were ready when Claydon flew in with the Beaver, accompanied by John Lewis in the Crossing Party's Otter.

The day after the planes left, invigorated by fresh food, Miller and Marsh began their long journey back to Scott Base, keen to keep the two dog teams together, and to continue glaciological and meteorological measurements. They travelled comfortably, both men and dogs in top form, their route guided by snow cairns, and their stocks replenished at the various depots.

*Left to right: Bob Miller, John Claydon, Sir Edmund Hillary, George Lowe and Gordon Haslop at Vahsel Bay 1955-56. Photo: Antarctica New Zealand Archives.*

Meanwhile, history was being made at the South Pole. On 20 January New Zealand time, Vivian Fuchs's Crossing Party roared in to be greeted by Hillary and US Admiral Dufek, both of whom had flown in from McMurdo for the occasion, accompanied by nine reporters. It was a momentous event, and regardless of how the media inflated the idea of tension between Hillary and Fuchs, each gave generous recognition of the other's achievement and seemed genuinely pleased to join hands at the bottom of the world.

The British journey from the Weddell Sea to the South Pole had been achieved in the face of great difficulties. In 1955-56 the *Theron*, a 830-tonne former Canadian sealer, had gone south to establish an Advance Party at Vahsel Bay on the edge of the Filchner Ice Shelf. On board were New Zealanders Hillary, Claydon, Miller, with compatriots George Lowe and Gordon Haslop who were to be part of the British team.

Fuchs's intention was to leave the Advance Party with enough supplies to establish Shackleton Base and prepare it over the winter for the Crossing Party the following year.

The Weddell Sea lived up to its notorious reputation for unpredictable and dangerous pack-ice. Like Shackleton's *Endurance* 40 years before, the *Theron* became trapped in the ice, unable to move despite all efforts to free the ship. The *Endurance* never survived the icy grasp, but fortunately for the *Theron*, after three weeks a small pool opened allowing Claydon to make a difficult take-off in the float-equipped Auster and to successfully locate a lead to open water. But this was not the end of their problems.

Unloading began as soon as a suitable site had been chosen in Vahsel Bay, but fears were held for the stability of the sea ice against which the ship was moored, and it was necessary to move as much of the supplies as possible straight from the ship to the top of the ice-shelf. Unfortunately the Ferguson tractors and Weasels were deep in the holds, and the overlying stores had to be dumped on the sea ice before the machines could be uncovered.

After a couple of fine days, the weather broke with little warning, a heavy sea rose, and after a hawser broke, the ship was forced to battle out through the accumulating pack to avoid being crushed.

The men ashore, including Miller, were stranded with only very basic supplies. Everyone was relieved when 24 hours later the pack ice drifted out of the bay and the *Theron* was able to return.

Four days later the *Theron* departed Vahsel Bay in falling temperatures

*Sir Vivian Fuchs at Depot 700 on the Crossing Party's journey from the South Poler. Photo: Antarctica New Zealand Archives.*

leaving the eight-man Advance Party safely ashore, although much later in the season than originally planned. The men's only shelter at that time were four tents and a Sno-cat crate. Their tasks before winter set in were formidable; a large hut had to be built, 300 tonnes of stores had to be moved 3km from the sea ice to the base site, dogs had to be bedded-down and vehicles maintained. The party was led by Ken Blaiklock, who although only 27 years old, was an Antarctic veteran.

Winter gales came upon them too fast and only the framework of the base could be erected before they were forced to make the 6.5m x 3m x 2.5m crate their winter home, with the bitterly cold tents for sleeping.

March blizzards produced huge snowdrifts, and after a visit to the sea ice to collect further stores, they saw that the sea ice had broken away, taking with it all of the coal, 300 drums of fuel, most of the stores, a lot of building material, their boat, and most of the seals they had killed for dog food.

Despite the set-backs, work continued on the base hut, although they estimated they had shovelled 80 tonnes of snow out in 3 months with 40 tonnes still remaining. Summer eventually arrived and conditions improved. The hut was finished and sledging journeys were made to the Theron Mountains.

Fuchs and others flew in by Otter aircraft from Halley Bay on 12 January, 1957, and shortly after the *Magga Dan* arrived with the rest of the party. This was roughly the same time that the New Zealand party had arrived on the Ross Sea side and Scott Base was built.

The British party's most important task was to identify a site for South Ice on the western site of the Shackleton Range from which the Crossing Party would leave the following spring. A site was quickly selected, and as time was running out, it was supplied by air involving 20 round trips.

The *Magga Dan* left the bay, Shackleton Base was expanded and South Ice was built. The two wintering teams, Hal Lister, Ken Blaiklock and Jon Stephenson at South Ice, and Fuchs and 12 others at Shackleton Base, now settled in and made plans for the following season.

On 8 October, Fuchs, David Pratt, Geoffrey Pratt and Roy Homard set off to make the first overland journey to South Ice in three Weasels and one Sno-cat, but the Filchner Ice Shelf proved far worse than expected, with some badly crevassed areas that slowed the party considerably. Air reconnaissance became necessary to cross or avoid some particularly broken areas.

Meanwhile, two dog teams had been flown ahead to the Shackleton Range to help reconnoitre a route up the crevassed ice slope at the head of the Filchner ice shelf. Further obstacles and crevasses were found later as both the dogs and vehicles skirted the end of the Shackleton Range and crossed the Recovery Glacier to the Whichaway Nunataks.

At one point it took the party four days to cover 4km of broken ground. Two weasels had broken down and only one weasel and the Snot-cat were still operational by the time they reached South Ice on 14 November, 22 days after they had hoped to be back at Shackleton Base, and one day before they were scheduled to finally leave for the crossing.

A new deadline of 24 November was set, and on that day the vehicles lined up outside the base; Fuchs in Sno-cat Rock 'n Roll, then David Pratt in Able, followed by the Weasels Rumble driven by Allan Rogers and Wrack and Ruin by Lowe; next was the Muskeg tractor Hopalong named by Australian Jon Stephenson, followed by Sno-cat County of Kent named by Homard.

One day later disaster almost struck. A crevasse bridge collapsed, leaving Rock 'n Roll precariously suspended over a chasm. David Stratton and Fuchs made a careful exit to safety by crawling over one of the pontoons. Crevasses continued to be a constant hazard. By travelling at night when the snow was harder the weary party eventually reached South Ice on 21 December having covered about 500km with almost constant pressure from unpredictable crevasses.

While Blaiklock and Stephenson reconnoitred the next part of the route with two dog teams, leaving 2 metre high snow cairns to mark the way, the seismic Sno-cat Haywire, which had been left at South Ice the previous month, now joined the party, together with another Weasel. Now that the RAF Flight had flown plenty of supplies in to South Ice, the Crossing Party left once more on Christmas Day, refreshed and towing a massive 32 tonnes of material for the journey, including explosives for regular seismic shots along the route.

The RAF Flight now moved in to South Ice in preparation for the first trans-Antarctic airplane traverse from South Ice to Scott Base. An abortive attempt, led by Squadron Leader John Lewis with New Zealander Flight Lieutenant Gordon Haslop, Flight Sergeant Peter Weston and Sergeant Ellis Williams, was made in the Otter on 30 December, but the weather was too bad with icing of the wings.

A second attempt was made possible when the Americans generously flew in five precious drums of fuel from Ellsworth Station. The Otter left again on 6 January, this time with no problems, and almost 11 hours later they were landing near Scott Base to be

*Bob Miller of the Southern Party with one of his favourite dogs "Butch", born the previous year at Mt Cook. Photo: Courtesy of Lady Majorie Miller.*

met by jubilant New Zealanders and Americans after a journey of 2110km.

By this time Hillary was back at Scott Base to meet the historic Otter Flight, the New Zealand Party having reached South Pole.

Beyond South Ice the Crossing Party was free of constant crevasses, but was fighting large areas of "murderous sastrugi" which slowed them down and caused irritating damage to the sledges and their towbars. A variety of mechanical problems were also plaguing the party and lack of spare parts meant that Weasel Rumble had to be left by the wayside, followed not long afterwards by the Muskeg tractor Hopalong. Seismic measurements continued to be made causing some delay.

As January progressed, another Weasel had to be abandoned together with a large sledge. A mysterious sickness, with nausea and high temperatures, struck the party, affecting all but two of the men.

But at last, on 20 January, they were met by a welcoming party just 3km out from South Pole Base, where they were given the warmest of welcomes.

After a four-day break, the British Sno-cats continued their crossing towards Depot 700, where Hillary, who had returned to base for administrative duties, was to meet them again on 7 February and accompany the group to Scott Base. On that same day, far ahead of them, Miller and Marsh were just coming into sight of familiar landmarks, such as Mt Warren near the head of the Skelton Glacier.

When they reached Depot 280 (Plateau Depot), direct radio contact was made with the Crossing Party. Despite white-outs, fog and low temperatures, the two men made good time descending the Skelton Glacier, the only sad occasion being the death of the dog "Hemp" through sickness.

On 13 February they reached Skelton Depot near the Ice Shelf and were met by Cranfield in the plane. The decision of whether to sledge or fly back to base was made for them, as there was insufficient fuel to fly the two teams out. The sun was now beginning to set and thick snow on some days slowed them down.

For the last day before reaching Scott Base, Marsh and Miller were joined by Major James Adams who wanted to do a study of cold weather reaction on the two men during their last day. After being in the field for 128 days and sledging 2675 kms, Miller and Marsh had just completed the longest sledge journey in New Zealand history, and opened up a previously unknown area of the Transantarctic Mountains.

On 2 March the Crossing Party drove across the ice and parked in front of Scott Base, greeted by the entire Ross Island community. The last leg had been relatively straightforward, apart from Geoffrey Pratt collapsing from carbon monoxide poisoning in his Sno-cat on the way to Depot 700. Hillary's guidance had been invaluable descending the Skelton Glacier "Staircase", directing the large vehicles away from badly crevassed areas.

With a congratulatory message from the Queen, and the bestowal of a knighthood on Vivian Fuchs, a great journey had ended.

# TRIBUTE

# WERNER GIGGENBACH 1937 - 1997

NZPA — New Zealand-based scientist Werner Giggenbach, who died in Papua New Guinea 7 November 1997, was one of the world's leading geochemists and volcano experts, colleagues say. Dr Giggenbach suffered a stroke while on a field trip to the Rabaul volcano with his wife, researcher Agnes Reyes, who worked with him at the Institute of Geological and Nuclear Sciences.

A highlight of Dr Giggenbach's career was in December 1978 when he entered the crater of Antarctica's Mount Erebus to collect gas samples — a feat that has not been repeated (see Antarctic extract below).

Dr Giggenbach, of Eastbourne, near Wellington, was born in Augsburg, Germany, in 1937. He studied inorganic chemistry at the Munich Technical University and undertook two years of post-doctorate research in the United States before moving to New Zealand in 1968. He joined the then Department of Scientific and Industrial Research where he was placed in the geothermal research programme and spent two years at Wairakei.

His particular interest was in understanding the relationship between water, rocks, and gases at elevated temperatures, and using the information to help predict volcanic activity and its effects on atmospheric pollution. His work frequently took him to dangerous locations, such as White Island and other New Zealand volcanoes. He studied active volcanoes in more than 20 countries.

**Extract from Antarctic March 1979**

Violent eruptions, stormy weather, and damage to equipment, made it impossible for the international team on Mt Erebus to obtain gas samples from fumaroles in the active inner crater. Two New Zealanders were the first ever to descend into the inner crater on 23 December, and Dr W.F. Giggenbach was within 20m of the crater floor when the first violent eruption occurred from the active vent.

This eruption showered the crater floor and the main crater with hundreds of lava "bombs," many still incandescent. In the 15 minutes after the explosion the level of the lava lake dropped 5m and then rose again. Although the eruption was one of the strongest observed last season shock wave effects were minimal. Dr Giggenbach was hit above the right knee by a small "bomb" still hot enough to ignite part of his clothing. But he, and his six colleagues on the inner crater rim were concerned about possible damage to the nylon ropes used in the descent. Therefore the attempt to reach the crater floor was called off so that the ropes could be checked. Nine men and one woman from New Zealand, France, and the United States, worked on Erebus between 10 December and 3 January, studying its volcanic and seismic activity.

First to make the descent after the inner crater had been quiescent for 14

*Continued on inside back page*

FEATURE

# THE RIDDLE OF THE ANTARCTIC PENINSULA

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

Climbing to the summit of Mt. Christiansen, off the north shore of Robertson Island, the sight that greeted Nordenskjöld once more changed his plan. Seals there were in plenty, but the 100ft ice wall they had encountered running away north west from there was really the edge of an ice shelf that engulfed the so-called Seal Islands and stretched away in a limitless expanse to the south. There had never been any seals near the islands, nor would there be on the coast they planned to follow to the south west. Somehow neither Larsen in 1893 nor they the previous autumn had seen anything of it on passage past Robertson Island.

They would have to take all the food with them instead of leaving some at the island. Counting on finding some at Cape Framnaes — a risky assumption seeing he had not seen its coast — he left a note telling Larsen he would leave news at that cape and might return along the coast all the way to Cape Foster.

The immediate problem of getting up on to the 300ft shelf was solved when Nordenskjöld found a snow ramp after the evening meal. It took the whole of 9 October to climb it and reach their camp on the Oceana Island nunatak.

Narrowly avoiding disaster the next day when Jonassen capsized the sledge after letting the dogs plunge down into the huge bergschrund surrounding the Seal Island nunataks, they reached the northern side of Castor Island, the southernmost one, the following night. Finding a gentle slope back up to the shelf surface and a good following wind helped them make good progress on 12 October, only to be held by a day-long blizzard. Starting south west in better conditions on the 14th three remarkable days in the annals of sledging ensued, during which they covered some 57 miles — 19 a day by Nordenskjöld's estimate using his pedometer, for they had no sledgemeter, relying entirely on Sobral's fixes using an artificial horizon, which the weather prevented him from using until several days later. Considering they could only move at the speed of the two men pulling on foot, not ski, and always ahead of the dog sledge, it was a marathon effort.

Weatherwise it was their only lucky spell south of the island. Pinned down by a blizzard for the next two days Nordenskjöld realised his only hope lay in a lightweight push for the peaks he began to see to the south above the whirling drift as the storm subsided. All that the remaining rations would afford was an 8-day round trip. They would have to take the smaller sledge with just the bare essentials.

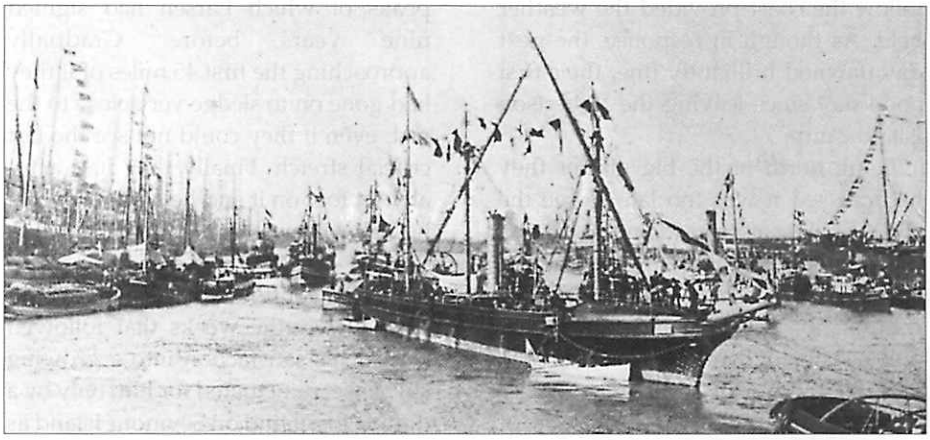
By lunchtime on 18 October conditions had improved enough for them to start. With the coast to the west largely obscured by drift they were crossing the badly crevassed snout of a glacier within the hour. With all of them on foot the three men somehow got the sledge across it, Nordenskjöld in the lead and sinking through a snow bridge up to his armpits every now and then with the others helping the dogs drag the load.

Crossing a wide valley beyond it they scaled another ice face by a snow ramp and dragged the sledge up a long slope of hard blue ice to reach the foot of a volcanic nunatak projecting almost 1000ft above the ice. After six hours of relentless going, once saved by the sledge alone from destruction in a crevasse, Nordenskjöld stepped on to solid ground, the first man to set foot on the coast that had defied every other attempt to approach it.

Forced to move camp twice that night as a veritable tempest descended on them, Jonassen badly injured his arm and, to cap everything, the dogs broke into their pemmican bag and devoured its entire contents, putting paid to any further advance.

When the storm died down on the evening of 20 October Nordenskjöld climbed the nunatak, which he named after Borchgrevink, to find everything blotted out by mist. The summit he stood on was just 3 miles south of the 66th parallel, and they had travelled 177 miles.

Leaving the others to pack the sledge he climbed it again in the morning to scan what looked like an ice-filled sound running west, flanked by mountains that dwindled into the distance where it seemed to curve northwards. Standing there with his camera, some 13 miles south of their camp of the 17th, he could see that the coast beyond him ran away to the south west, but the view to the west held the promise of an infinitely more dramatic discovery.



*Nordenskjöld's ship 'Antarctic' departs from Gothenburg 16 October 1901.*

Like De Gerlache he was convinced of the existence of Dallmann's Bismarck Strait. Assuming the sound ran on to the north west, and knowing that was the very direction of the "vaste baie ou détroit" on Lecointe's charts which De Gerlache believed might be the real strait, Nordenskjöld concluded that the two were connected, although he was sure the passage would never be navigable. *(a)*

As it would so often do, the Antarctic had deceived the eye of its beholder, not a little aided by the allure of discovery. It was to fall to the French, fourteen months later, to spell

an end to Nordenskjöld's hopes and move the elusive 'strait' further into the southern mists, there to remain an enigma that would draw the Canadian aviator Sir Hubert Wilkins southward to pursue its quest, a quarter of a century later.

As he returned to his camp that day, 20 November 1902, Nordenskjöld faced the formidable challenge of how to accomplish the rest of his goals without any pemmican for the dogs. Starting on their precarious run back to the depot camp with the coast always invisible, Nordenskjöld was haunted, as Scott would be nearly three months later, by fear of missing the sledge that carried their only means of survival.

However all went well and, once arrived, Nordenskjöld recalculated the rations to see what they would be able to do. The dogs would have to be fed on the men's pemmican, and an acceptable reduction in their own ration could provide the dogs with 8ozs daily. That ought to allow them to follow the coast provided the weather held. As though in response, the next day dawned brilliantly fine, their first good day since leaving the Robertson Island camp.

Being north of the big glacier they had crossed it was too late to see the 6500ft skyline at its head and so missed the chance of realising that the Richthofen Valley Nordenskjöld mistook for the Bismarck Strait was only a stagnant overflow from a breach in its southern wall.

Now there was the prospect of getting ashore for rock specimens at a prominent cape 16 miles ahead of them. Just as Scott and his two companions would be, they were frustrated by a deep canyon in the ice shelf and had to sledge out eastward to clear it. To this day the cape bears the name they gave it — Cape Disappointment.

When 23 October dawned with thick fog they knew the chance of following the coast had gone. Their survival depended on heading direct for the island and when, a day's run from it, a two-day blizzard ate into their reserves, they began to think they would have to kill the sheepdog to feed the others. But 30 October was fine enough to pose no problems for their descent to the sea ice at their old camp, where plentiful seals ended their worries.

Aided by a makeshift sail and a stiff following wind they were back at Lockyer Island after three days. There the weather looked menacing so they all voted to continue despite having covered 23 miles on the third day. Carrying on up the Sound they arrived in a completely exhausted state at 1.30am on 4 November to rouse their surprised comrades fast asleep in the hut. The Falklands dog collapsed, doubtless permanently weakened for he was soon killed by his erstwhile harness mates, while Sobral fainted after they had eaten, and Nordenskjöld nearly did so while helping him into his bunk.

The Swedish university lecturer was well pleased with what they had achieved, in spite of the twin blow to his plan through lack of seals and Jonassen's injury that undoubtedly led to the demise of the sealmeat bag. Travelling some 30 miles from the land they had discovered some 65 miles of coast never seen before, and gone on to locate, though not survey, 80 miles of the coast south of Robertson Island, the peaks of which Larsen had sighted nine years before. Gradually approaching the first 45 miles of it they had gone on to sledge very close to the rest, even if they could not see the last crucial stretch. Finally they had actually set foot on it and he had seen what he believed was the elusive Bismarck Strait.

At first confident that Larsen would soon arrive, the weeks that followed turned his satisfaction into a growing suspense, punctuated for him only by a double fossil find on Seymour Island as he visited it to look out for the ship. On 4 December he had first chanced upon fossilised bones which he immediately recognised as important — they proved to be those of penguins some 65 million years old — and then the much sought plant fossils that till then had eluded his greatest hope as a paleontologist. Little knowing that his find was shortly to be eclipsed by his own second-in-command, the geologist Gunnar Andersson, his conviction that they were significantly older than the bones he had found was to be fully borne out.

Early in January he realised the ship might never reach them that season and began laying in seal blubber because their coal was totally inadequate to see them through the winter, as was their food. They would have to undertake the grisly task of killing and skinning about 400 Adélies at the Seymour Island rookery. Camping near it with Ekelöf and Jonassen the slaughter began on 5 February 1903, Nordenskjöld wishing the ship would arrive so they could put an end to it.

Little did he realise that the *Antarctic*, fatally holed on 11 January was a bare 12 miles from them, helplessly locked in the pack with seven pumps going day and night to keep the water down.

A week later Larsen and his shipmates were afloat on an ice floe. Their ship sunk, twenty souls with two boats and seven tonnes of stores and possessions were fighting northward towards the coast of Dundee Island and the tiny pimple of Paulet Island, agonisingly distant beyond an obstacle course of grinding pack.

Joined by Gunnar Andersson before he sailed, Larsen's winter marine survey and geological programme at South Georgia had yielded the first fossil remains found on that island. But by the time he brought the *Antarctic* back to Port Stanley, the senior zoologist Axel Ohlin had been so seriously ill that he had to return to Sweden, where he died a year later.

Sailing again on 6 September 1902, once more to have her coal replenished at Ushuaia, the Argentine government also paid for the ship's bottom to be scraped and the overhaul of sails and rigging before she left again on 5 November, bound for the first proper survey of the coast they had discovered west of Astrolabe Island.

Hindered by abnormally abundant ice Larsen had found the southern end of the Antarctic Strait blocked by heavy pack. Trying to pass east of Joinville Island, the ship was caught in the pack and carried 100 miles towards Elephant Island, and then back again.

Andersson had by that time, 21 December, decided that the men at Snow Hill would have to be brought to the ship if they could not reach them by 10 February, and that meant landing him and two others straight away to go round the mainland coast of Erebus and Terror Gulf to start back with them from Snow Hill if the ship did not arrive in time. Selecting Duse as navigator and one of the Norwegian seamen, Toralf Grunden, who had been ashore with him at South Georgia, the party had to be landed at the glacier bay Nordenskjöld had pointed out on the west side of Antarctic Strait.

The three men were landed on 29 December with two months' supplies for nine men. Much of the gulf was frozen and they had no need to follow the coast but were stopped by open water as they neared Admiralty Sound. Meanwhile Larsen had worked his way south past Joinville Island by New Year's Day 1903, only to be trapped once more in the pack.

Eleven days later a huge crash had brought everyone on deck as the ice fatally holed the ship, jamming itself under the stern that was thrust bodily upwards about four feet. It had torn away a third of the keel but as though to compensate had promptly stemmed the inrush of water.

It was the start of a month of being carried to and fro in the gulf which ended in the ship's doom in the early hours of 12 February when the ice parted and the pumps could no longer hold the water level down. Larsen had foreseen her fate and by then two boats and a mass of stores were on the floe beside her when the order rang out to abandon ship.

Only the day before the three men at Hope Bay, as they had named the glacier bay where they had waited since the day after the ship was holed, had given up hope of the ship's return. Realising they had only two tents and none too much food with which to survive an Antarctic winter (they had assumed plentiful numbers of seals and penguins), they started to build a stone shelter to move the larger tent into.

The fortunes of the Swedish expedition had reached their lowest ebb. Split into three beleaguered parties, each unaware of the others' fate, the mending of their destiny was to weave a story infinitely more surprising than the harsh reception the Weddell Quadrant had dealt them.

*To be continued.*

NOTES:

*(a)* The inlet De Gerlache believed might be the real Bismarck Strait was in 65 25S. Sobral's position fix for the depot camp (65°48S 62°11W) suggests their advance in the teeth of the wind to the Borchgrevink Nunatak on 18 October was some 15 miles in 6 hours. Despite the lighter load that would have been altogether remarkable, given their crossing of what must have been the Leppard Glacier tongue. Nordenskjöld does not record the mileage on the 11 October first day's march from the Castor Nunatak (easternmost of the so-called Seal Islands), but subtracting his 57 miles estimate for the subsequent advance to the depot camp from Sobral's position for it implies only 12 miles on the 11th with the wind directly aiding them.

(It is altogether more likely the mileages were the other way round, e.g. 15 on the 11th and 12 on the 18th. That would place the depot camp in 65°51S, south of the Flask Glacier tongue, the position adopted for this narrative. Such a position is also suggested by Nordenskjöld's reference to soon encountering "unpromising ice" that persuaded them they would "fall in with a new glacier" the day they started north from the depot on 22 October. There is no reference to such a surface in his account of the journey south to it, which is consistent with the direction of their approach from the north east having avoided its outermost crevasses.

Outward or homeward bound weather conditions clearly prevented them seeing either glacier, let alone the 30 miles up the Leppard Glacier to its summit, or Nordenskjöld would have understood the nature of the Richthofen Valley with its seemingly flat surface curving into the latter about 10 miles from him as he photographed it from the Borchgrevink Nunatak. )

# BOOK REVIEW

## SOUTH POLE: 900 MILES ON FOOT

*By Gareth Wood with Eric Jamieson*
*Published by Horsdal and Schubart, 1996.*
*226 pages, $25 soft cover.*
*Available from The Polar Bookshop*
*Reviewed by Sir Ranulph Fiennes*

In the summer of 1996 I meet Gareth Wood for the first time in Whistler, British Columbia. I was there with Dr Mike Stroud and three other members of a British team entry for the Eco-Challenge six-day mountain race.

Gareth had heard of Mike's visit and travelled up from Vancouver to say hello. I felt I knew Gareth extremely well, through polar talk of his doings, and when I met him I was pleased to find him exactly as I had imagined, a gentle giant with a quiet but forthright manner. His book "South Pole — 900 miles on foot" is a tribute to his ability to forgive yet not forget. The expedition which he describes was probably the nastiest experience of his life in many different ways and had he written about the long polar nightmare immediately on his return (as two of his companions did) the description would doubtless have been as bitter as theirs; full of recriminations and accusations.

The passage of ten years between the polar journey and Gareth's narrative has enabled him to distill the telling of it into a rationalized tale of a great achievement where descriptions of human failings and unpleasantness are balanced and not vindictive. This makes for an interesting comparison with the original book, by the expedition leaders Mear and Swan.

Gareth tells of the mounting tensions in the polar base where he and the four other team members spent a winter close to Scott's abandoned hut preparing for their own attempt to follow in Scott's footsteps. The fact that Gareth's team had no clear and absolute leader was a catalyst for trouble. Swan was the inspiration and 'sponsor-getter' for the project whilst Mear, an experienced mountain guide, was the practical field leader. The two irritated one another. Nor did they decide who was to be the third man on their polar team until shortly before final departure.

Gareth Wood and Mike Stroud were left with a Damoclean sword hanging over them through the long winter months. One of them would sooner or later learn that they would be left behind: further dissention naturally resulted. Gareth tells it all with fairness and clarity but the reader is nonetheless wrapt with the inner furies and frustrations of the five lonely men during that long winter of discontent.

As an attempt to repeat Scott's epic journey — the expedition was named "Footsteps of Scott" and set out to travel unsupported at all times. Sadly,

on the Beardmore Glacier, Mear, Swan and Wood met up by chance with an American scientific team and for two days accepted quantities of their food. In Mear's own words "Gone was the knowledge that we were engaged upon an unsupported journey of a magnitude that was unique".

Gareth and the other two did reach the Pole but, unlike Scott, they did not attempt the return journey: they were flown out by US navy transport. Nonetheless their feat was a prodigious accomplishment for, despite the internal strife and hostilities, they *worked together* to manhaul enormous weights over some 900 miles of often lethal terrain with no impetus but their own stubborn willpower.

Most subsequent journeys have used wind-power to help pull sledges. So indeed had Scott, Shackleton and Amundsun before them. However, in the 1990's, Pole aspirations began to use hi-tech parawings and kites to sail-ski to the Pole and this is a very different kettle of fish to the manhaul effort of Gareth's journey. So long as sails only helped the man-hauler when a following wind existed, very little assistance could be gained and side winds prevail over 90 percent of the way to the Pole. The latest parawings now allow side winds to be harnessed as well and that puts a very different complexion on the whole affair.

In 1993, with Gareth's old colleague Mike Stroud, I completed the first unsupported journey across the Antarctic continent. We used following wind' upski-sails on those rare occasions when wind conditions allowed. The journey was difficult, the sledge weights started at 485 lbs each and we used up to 10,000 calories each per day.

Then, in 1996, I tried the crossing solo, using the latest type of kite and, despite only four practice sessions in its usage, I managed up to 120 miles a day with minimal effort. To describe ski-sailing as unsupported travel is generally acceptable among the polar fraternity but it is increasingly an anachronism for hi-tech sails allow sledge weights to be cut in half, effort to be reduced accordingly and speeds to accelerate beyond the wildest dreams of Scott and Co.

Gareth's manhaul achievement was scarred for him by the bitterness of the internal struggles of his team but he uses the benefit of ten long years of reflection and the perspectives of hindsight to tell a great story with insight and a shrewd eye for psychology. I highly recommend his book to anyone who enjoys true adventure and a hard-won personal account of an epic struggle.

# TRIAL BY ICE

## THE ANTARCTIC JOURNAL OF JOHN KING DAVIS

### EDITED BY LOUISE CROSSLEY

*Bluntisham Books and Erskine Press 1997 £29.95, NZ$55.00*
*ISBN 1852970472. Reviewed by David L.Harrowfield*

Dr Louise Crossley expedition and station leader at Australia's Mawson Station in 1991, is well known for her excellent book Explore Antarctica, published by Cambridge University Press in 1995.

Although not a specialist in Antarctic maritime history, Crossley has completed the formidable task of editing and making available for the first time, the diaries of Captain John King Davis. He was beyond doubt, the finest Antarctic mariner of the famous 'ëheroic-era' of exploration 1895-1917. Antarctic historians have waited a long time for this book. The diaries are presented chronologically and cover Davis's seven Antarctic voyages from 1907-30.

Davis who began his apprenticeship on a splendid full-rigged ship the Celtic Chief, served as First Officer on the Nimrod in 1907-09. He left only a brief record of the British Antarctic Expedition voyages which are nicely detailed in Shackleton's Lieutenant (Polar Publications 1990) and in the diaries of A.E.Harbord and H.B.Bull, held in Canterbury Museum Christchurch. It was Mawson's Australasian Antarctic Expedition 1911-14 however, described by Davis as "my main life's work", which comprises about half of the books content. In Chapter 3 is a very readable nautical account in which key elements of the Antarctic, the weather and ice, dominate entries. "It is a wonderful sight this world of ice and sea" wrote Davis. But towards the close of the second voyage (Chapter 4), and having turned north without Mawson, the strain of being a captain on the Aurora in unchartered Antarctic waters, was beginning to tell. Davis recorded, "The trip has taken it out of me in a way I did not think possible. . ." and on the third voyage he added, "It is very difficult for anyone not a seaman to realise all the risks one takes, pottering about an unchartered coast".

In contrast to the AAE voyages, once initial problems of command were overcome, the Ross Sea Relief Expedition 1916-17, was a totally different operation. Already familiar with the region including McMurdo Sound, the voyage which relieved the seven surviving members of Shackleton's Ross Sea Party 1914-17, was accomplished without difficulty although Captain Davis was clearly affected by the loss of Lieutenant Mackintosh whom he had known from the Nimrod, Spencer-Smith and Hayward.

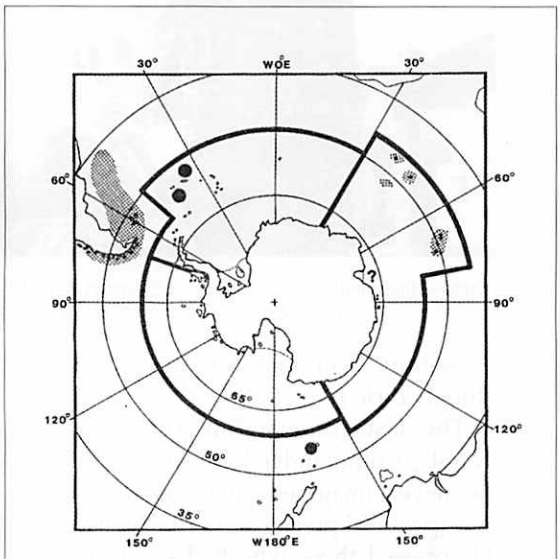
In Chapter 7 and 8 covering the first voyage of the British Australian New Zealand Antarctic Research Expedition 1929-30, Mawson was expedition leader and Davis was second in command and master of the Discovery. Before even departing London, there was disagreement between the two men. During the voyage problems with the handling of the ship, shortage of coal and Mawson's own agenda, led to considerable tension throughout the expedition with the result that Davis refused command for the second voyage. "It has been a big strain", he wrote. Particularly interesting are Captain Davis's comparisons between the handling of the Aurora and Discovery. Yet in time, the problems of the voyage were forgotten and the two men became life-long friends.

While Davis was a prudent man and as Crossley states a pessimist, hence the nick-name of 'Gloomy Davis', he also had a nice sense of humour. A professional man, he expected the best and was highly respected by those who served under his command. He also showed considerable interest in the natural history of the Antarctic. His fascination and support for science resulted in a comprehensive oceanographic record of the bathymetry, sediments, temperatures and biology of the Southern Ocean. *Continued on inside back page*

*Continued from page 4*

informal discussion in the margins of the meeting between the countries most affected by the illegal fishing, and it was recognised that the fishing problem was a major challenge to the "credibility and workability of CCAMLR". Major discussion of the problem had to wait for the XVI CCAMLR meeting in October 1997. The speed with which the problem has developed can be seen in how the subject of illegal, unregulated and unreported fishing was added to the agenda at the meeting, and that fishing is now placed on the agenda for XVII CCAMLR meeting in 1998.

The CCAMLR Scientific Committee warned that toothfish stocks in the Southern Ocean faced collapse because of illegal overfishing and threatened the survival of several species of seabird in the Southern Ocean. Additionally, the illegal fishers are ignoring preventative measures that can reduce seabird deaths. The mortality of seabirds in the unregulated fishery is probably at least twenty times greater than in the regulated fishery and this is entirely unsustainable for species of Albatross and Petrel that are classified as globally threatened. As well as these immediate threats to toothfish and seabirds it was also recognised that "overfishing, illegal, unregulated and unreported at this moment constitutes a most serious challenge to the reputation and credibility of CCAMLR as an intergovernmental organisation for rational management of living marine resources on a sustainable basis."



The Southern Ocean

At the CCAMLR meeting the Standing Committee on Observation and Inspection (SCOI) discussed possible measures to resolve the problem of (1) unreported and unregulated fishing by non-Members, and (2) illegal fishing by CCAMLR members. Discussion included inter alia, punitive measures aimed at removing the economic benefit of illegal actions and attempts at gaining information on the destination market nations. Three specific Conservation Measures (CM) were passed: CM 118/XVI Scheme to Promote Compliance by non-Contracting Party vessels with CCAMLR Conservation Measures, CM 119/XVI Requirement for Contracting Parties to Licence their Flag Vessels in the Convention Area, and CM 120 XVI Prohibition on Directed Fishing for Dissostichus spp. Except in Accordance with Specific Conservation Measures.

Also passed was a resolution on Vessel Monitoring Systems (VMS), 12 /XVI Automated Satellite-Linked Vessel Monitoring Systems. The VMS resolution failed to be a Conservation Measure because agreement on mandatory usage could not be reached, as some countries were worried about the timetable for implementation. The weaker resolution was a "significant disappointment" to New Zealand, which felt that VMS should not only be mandatory but should be applied to all fisheries in the Convention area, not just the finfish fisheries.

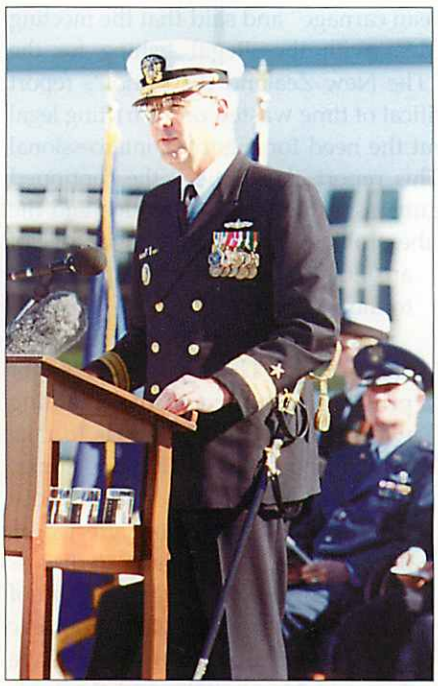
Despite these steps not all reaction to the measures taken by CCAMLR has been warm. The Royal Forest and Bird Protection Society called on the New Zealand government to stop the "Southern Ocean carnage" and said that the meeting failed to effectively deal with the illegal fishing for the Patagonian toothfish. The New Zealand delegation's report on the meeting was critical of time wasted on restricting legal fishing and pointed out the need for vigorous intercessional work on the issues. This report also noticed the continued tensions over sovereignty issues between Argentina and the United Kingdom and the problem that an adversarial tone of an "EC versus the rest'" attitude gave to the meeting.

Early indications are that fishing is continuing. There are reports of private Chinese companies building two hundred fishing vessels to take advantage of toothfish stocks. Outside of CCAMLR those Contracting Parties most affected by illegal fishing are meeting to discuss ways of dealing with the problem of illegal fishing. The East Antarctic Coastal States (EACS) met in Cape Town in March 1998, and the topic was to be addressed in the margins of the next meeting of the Valdivas group. These states are motivated by self-interest as illegal fishing threatens a potential fishery for their companies and has now occurred in most southern EEZ. These multilateral efforts will probably include some discussion concerning surveillance regimes. Attempts at enforcement will be difficult, but the sheer scale of problem means interventionist methods can be only partially successful. One problem here is that protection action by one state can lead to a displacement of poachers into other waters where enforcement is weaker.

If it can be proven that fish is being taken illegally from waters where national law applies, the vessel owner and crew can be prosecuted and the vessel and its catch confiscated. But if the fish come from waters off Antarctica where a state does not have an EEZ, or if the vessel is from or reflagged to a state that does not recognise a national territorial claim in Antarctica, then the problem of enforcement is complicated by the Antarctic Treaty. The unresolved sovereignty claims in Antarctica and its current demilitarised status mean that patrols to stop illegal fishing could be a breach of the Treaty. This could potentially set off the sovereignty issue that has been largely dormant since 1959. While in the past states have managed to work around the sovereignty problem; the addition of an economic incentive could lead to a stronger expression of national self-interest.

From this there could develop a wider threat to the special ethos of the Antarctic Treaty System (ATS). If CCAMLR does not deal with the fishing situation effectively then the problem may draw the attention of the ATCM. If CCAMLR is shown to be impotent and the Antarctic Treaty does not manage to resolve the problem then the ATS will be weakened. Its credibility would be reduced and the internal dissension created could hamper other ATS endeavours. This would be obvious if Antarctic Treaty Consultative Parties begin taking action independent of CCAMLR to protect their national interests, or if other regional fisheries management bodies take action to replace CCAMLR schemes with their own efforts.

***Continued on page 24***



*Rear Admiral William Sutton, commander Naval Base Pearl Harbour, speaking at the NASU disestablishment ceremony.*

*Captain Hugh Smith, commander US Naval Support Force Antarctica and Colonel Graham Pritchard, vice-commander 109th Airlift Wing, New York Air National Guard, Detachment 13, US Air Force.*

***Continued from page 2***

Wilkes, Scott, Amundsen, Mawson, Hillary, Shackleton and others spans the Mechanical Age which started with the introduction of aviation and the use of technology to explore the continent.

Chiang says it was the hard-earned knowledge of the US Navy, gained in building coastal and inland stations, developing infrastructure and perfecting the use of aviation that became the foundation that makes scientific effort possible today.

The National Science Foundation will continue to oversee and support the US Antarctic Program and "NSF's support for scientific research in Antarctica remains as strong as ever," added NSF director Neal Lane in Washington DC.

"We thank the Navy for decades of support, which has helped to advance research important to the future of our planet studies on the ozone hole, the stability of Antarctica's ice sheets and the dynamics of the Southern Ocean."

The NSF adds that the monniker "Operation Deep Freeze" formerly referring to Navy logistics support, will now designate flight support by the Air National Guard of the US Air Force. The ceremony was attended by Rear Admiral William Sutton, commander Naval Base Pearl Harbour/ commander Naval Surface Group Middle Pacific and Assistant Secretary of the Navy Robert Pirie Jr.

The last commanding officer of NASU, Commander John Stotz, said he never imagined such an august group would preside over his demise. He praised those who had given the navy operation at Christchurch a reputation for efficient, friendly, service, "people to whom the job was more than a paycheck."

The dedication and expertise of the military men and women of NASU had been "spot on", he said. The direction and "deck-plate leadership" of the US Army's terminal operations contingent "was the operating heart of the unit." Radiomen had spent countless hours providing "flawless round-the-clock service."

Business relationships had been more in keeping with "traditional Kiwi hospitality than business."

Cmdr Stotz presented service medals to several long standing civilian employees and was in turn awarded the Navy Gold Star for outstanding service by Captain Hugh Smith commander Naval Support Force Antarctica.

Captain Smith said the ceremony marked the end of one segment of the command's history and signalled a new opportunity for even greater achievement in the future of Operation Deep Freeze.

"Today is a sad day but one whose time has come," he said, transferring command of Operation Deep Freeze and the leadership of the US Department of Defense's forces in Antarctica to the Air National Guard.

Colonel Pritchard, of the Air Guard, said the disestablishment of the Navy unit was a significant and "perhaps bittersweet day" for the officers, men

*Cmdr John Stotz, last commanding officer NASU.*

*Cmdr John Stotz salutes and signs off..."Fair winds and a following sea".*

and women of Naval Antarctic Support Unit "as they conclude their era of noble service to the US Antarctica Program."

"Their activity in Christchurch, the gateway to Antarctica, has sustained the flow of people and material destined for Antarctica and welcomed them home as they returned from the frozen South."

"This is also a significant day for the 109th airlift wing and the New York Air National Guard which 23 years ago inaugurated our own journey into the world of polar support on the vast ice sheet of Greenland and the sea ice of the Arctic Ocean."

*New York Air National Guard Christchurch unit members welcomed at a reception held at the Visitor Centre, International Antarctic Centre. (Picture: Susan Beeman).*

Meeting the challenges that preserves the unique southern continent is "why we are here."

"We in the Air Guard know we have a tough act to follow but follow it we will."

The 109th Air Wing of the New York Air National Guard already has 10 years of experience flying in the Antarctic. In the last several summers it has operated LC-130 ski-equipped Hercules aircraft to supplement LC-130 operations by Antarctic Development Squadron 6 (VXE-6), US Navy.

Beginning in the 1999-2000 austral summer, the New York Air National Guard will be responsible for all US LC-130 Hercules flying in Antarctica and between Christchurch-Antarctica. VXE-6 will complete its last season of Antarctica flying during the 1998-99 austral summer and will be decommissioned in 1999.

The National Science Foundation funds both VXE-6 and the Antarctica mission of the Air National Guard which has assumed the Navy's role of flying the ski-equipped LC-130 Hercules aircraft owned by the NSF and the Air Guard.

These big ski-planes are the backbone of the USAP's ability to support research across the breadth of the Antarctic continent. The LC-130s ability to shuttle materials and people to the South Pole will enable replacement of major parts of Amundsen-Scott South Pole Station.

This project now under way paves the way for construction of a modern scientific observatory that will stand well into the 21st century. Many other functions performed by the Navy for the USAP have been transferred to civilian contractors, particularly Antarctic Support Associates (ASA), based in Denver, Colorado.

As an effect of the out-sourcing, the compliment of US personnel stationed at Christchurch airport will drop from around 40 to 7. The personnel will all be drawn from the Air Guard and comprise a separate unit with responsibility for all DoD support work in Christchurch.

*Cmdr John Stotz confers a service medal to a civilian worker at NASU.*

The unit will supervise all activities related to aircraft, flight line and ramp operations for the USAP aircraft and for weekly USAF Mobility Command flights to New Zealand.

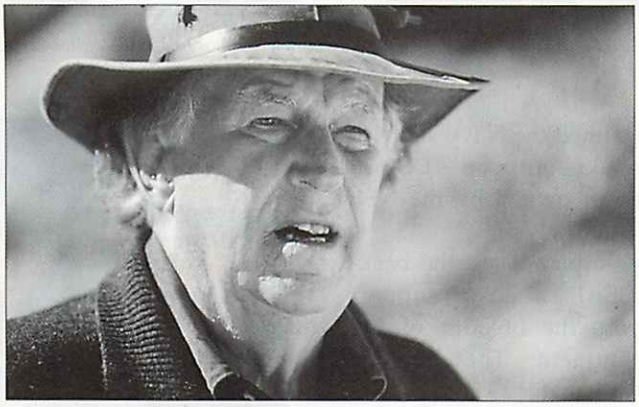
Around 18-20 local staff will be employed by ASA. Local companies will have the opportunity to win contracts from ASA on a continuous basis. The rebuilding of the South Pole station is expected to generate around 60 construction positions which will join 140 personnel stationed during the summer at the base, but buildings and materials are expected to be sourced from the US.


*LC-130 of the New York Air National Guard at Operation Deep Freeze, Christchurch International Airport.*

# GENERAL

## TVNZ HILLARY SERIES VIDEO SPECIAL PROMOTION

With thanks to TVNZ, Antarctic is able to offer four readers the chance to save $20 on their purchase of the collectors video set of the "Hillary — A View from the Top" Series. The epic documentary series was recently screened on New Zealand television. Epics 1&2 and 3&4 have been amalgamated onto two videos to provide a comprehensive package of the outstanding programme.



**This Antarctic special double video set is available for only NZ$59.95 to the first four readers who write in.**
*(The recommended retail price is NZ$79.95.)*

***Hurry! If the number of entries received is considerable, Antarctic may then get the opportunity to also offer late entries the video set at a discount.***

**Please post, fax or E-mail your name, postal address, phone/fax number and/or E-mail address to: Hillary Video, PO Box 3269, Christchurch, New Zealand. Fax: +64 3 365 4255 or E-mail: headcon@chch.planet.org.nz**

## RESULTS OF THE AHT LOTTERY

The 14 day cruise for two into the Antarctic Peninsula area, donated by Orient Lines, operators of the tour vessel "Marco Polo" from Ushuaia in Argentina was won by Inez & Richard Vlaar of Wellington. They had a long standing interest in Antarctica and returned highly enthused about the experience and the work of the Trust.

## FOTHERINGHAM WINS FELLOWSHIP

The Winston Churchill Memorial Trust Board has recently announced fellowships for 26 New Zealanders of all ages to travel overseas to carry out a wide range of research projects. One of the fellows is former Scott Base base manager, Brent Fotheringham, who will travel to Australia, South Africa, England and America. He will undertake historical research into the early ecological and cultural history of the New Zealand Sub-Antarctic Islands to support bi and sesqui-centennial commemorations, in the year 2,000, of their discovery and settlement. He will also investigate the potential for a World Heritage (Cultural) listing for the Auckland Islands.

## WILSON OF THE ANTARCTIC

Does anyone know the whereabouts of the original New Zealand paintings and drawings of Edward Wilson of the Antarctic? His nephew, Dr David Wilson, is keen to locate any non-Antarctic material relating to his his uncle's stay in New Zealand with his wife Ory. David would be particularly interested to know of any letters written by Edward Wilson and Ory while in New Zealand.

If you can help, please contact:
**Dr David Wilson**
**71 Myddelton Avenue**
**Enfield**
**Middlesex EN14AQ**
**United Kingdom**

David Wilson was recently in New Zealand researching his Uncle's stay in this country on his way south to Antarctica with Scott.

## FISH AND SEABIRDS THREATENED IN THE SOUTHERN OCEANS

*Continued from page 21*

**Conclusion**

Illegal fishing is a serious challenge for CCAMLR, it is not yet too late for action, but there is only a limited amount of time before the 'piracy' exhausts the fishing stocks in the Southern Oceans. It must not be distracted from the problems facing it, and member states must be willing to allocate the resources necessary for the enforcement that will make conservation measures credible. As a first step CCAMLR members must get their own houses in order. Establishing a resource management regime in an area of biological uncertainty requires accurate scientific information which will take time to gather and collate into effective ecosystem models. Meanwhile, a credible enforcement is necessary to reduce the damage that the 'piracy' in the Southern Oceans is causing to a potentially sustainable resource.

# MEMBERSHIP

**The New Zealand Antarctic Society Inc.**, was formed in 1933. It comprises New Zealanders and overseas friends, many of whom have been to the Antarctic and all of whom are interested in some phase of Antarctic exploration, history, development or research.

**Annual membership of the Society entitles members to:** *The Antarctic Journal*, which 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.

Members also receive a regular newsletter called *Polar Whispers*, an annual *Polar Log*, which records the decisions made by the Society's Council at its AGM, catalogues of the Society's mailorder bookshop 'The Polar Bookshop' and occasional brochures from the Society's 'Sales Stall'. Regular meetings are held by the Auckland, Wellington, Canterbury and Otago branches.

**You are invited to join - please write to:**
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or Telephone: +64 (0) 3 377 3173
Facsmile: +64 (0) 3 365 2252
E-mail: marga@chch.planet.org.nz
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All administrative inquiries should be directed to the National Secretary. Inquiries regarding back issues can be made to the Back Issues Officer, at the above address.

**Members should direct other inquiries to their local branch.**
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Secretary, Wellington Branch,
New Zealand Antarctic Society Inc.,
P O Box 2110, WELLINGTON 6000

Secretary, Canterbury Branch,
New Zealand Antarctic Society Inc.,
P O Box 404, CHRISTCHURCH 8000

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## WERNER GIGGENBACH 1937 - 1997

*Continued from page 19*

hours was Colin Monteath. Wearing a helmet and protective clothing, and carrying a gas mask, he abseiled down on ropes anchored close to the halfway point on the inner crater rim. He reached a point some 70m below the rim, but it was found that both descent and belay rope were too short to reach the inner crater floor. This descent was made about 4p.m. An hour later Dr Giggenbach began the second descent, the belay point having been moved, and another length of rope tied to the descent rope. He encountered no problems, but just as he was about to disentangle a length of extra rope the eruption occurred, and a shower of volcanic debris, ranging from ash to "bombs" the size of footballs, rained down the inner crater wall.

A Z-pulley rope system had been installed on the main crater floor so that anyone could be hauled up from the inner crater in 10 to 15 minutes. After a discussion by portable radio the descent was called off, and Dr Giggenbach was able to make a rapid ascent without any difficulties.

There was another eruption of similar size to the first at 8.25pm when the party was leaving the main crater to return to the summit camp. Once again the area was showered with lava "bombs" of all sizes. The eruptions, followed by high humidity and low visibility in the crater area, and later by high winds, prevented any more descents into the inner crater.

## TRIAL BY ICE

*Continued from page 23*

Although familiar with Captain Davis's two books, With the *Aurora* in the Antarctic and High Latitude, both now out of print, I found as I read Trial by Ice, it interesting to compare some entries with those of Mawson (Mawson's Antarctic Diaries Ed. Fred and Eleanor Jacka 1988). This gave me a more balanced overview of two key personalities on the voyages of the BAE, AAE and BANZARE (first voyage) expeditions.

Louise Crossley has provided very useful introductory record of Captain Davis's career, and preliminary summaries and end notes for each chapter. The glossary is particularly useful although there were some terms and nautical expressions used by Captain Davis, which could have been included. There is a simple yet very clear map on the front and end papers and it was good to see unfamiliar illustrations although the reproductive quality of some of these may have been slightly better.

Bluntisham Books and the Erskine Press have again produced a fine case-bound volume with attractive jacket, which will be an important reference work and enhance the polar literature. With facsimiles of polar classics now becoming increasingly available, it is good to see another work with a strong nautical content. Trial by Ice is a very readable book particularly for those fortunate to have travelled the Southern Ocean and is to be strongly recommended for libraries and to all with an interest in Antarctic history.

NEW ZEALAND ANTARCTIC SOCIETY