

# ANTARCTIC



The Journal of the New Zealand Antarctic Society Vol 22, No. 3, 2004

## New Antarctic Science Season





Inside Scott's Hut at Cape Evans. December 2003, Luke Copland.

# ANTARCTIC



## COVER



*Cover photograph: White-capped Mollymawk captured in flight by photographer Lynda Harper. Mollymawk is the common name for some of the smaller Albatrosses.*

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# Hallett Station Clean-up

The Protocol on Environmental Protection to the Antarctic Treaty obliges signatory countries to clean up past sites of activities and old waste disposal sites, as long as doing so does not cause further environmental harm.

This agreement has been in force in New Zealand since 1994 and internationally since 1998. Antarctica New Zealand has been involved in two international clean up projects this year,

of contamination. Based on these investigations, New Zealand and the United States agreed to remove numerous small fuel storage tanks and one large tank, remaining buildings, equipment including two large sleds, a Caterpillar D4 bulldozer, residual debris and the most hydrocarbon contaminated soil from the site.

Cape Hallett is over 600 km away from Scott Base and McMurdo Station, does not have aircraft landing



*Waste materials from the old station at Cape Hallett awaiting removal. (Photos: Antarctica NZ Photo Collection)*

including Hallett Station at Cape Hallett, which was operated jointly by New Zealand and the United States from 1957 to February 1973, on the eastern side of Cape Hallett.

It was run as a year-round research station until 1964 when the main scientific laboratory was destroyed by fire. The station was then used as a summer only research station until 1973 when it was abandoned.

Between 1984 and 1987 various clean up activities were undertaken at Cape Hallett, including dismantling the bulk of the old station buildings and cleaning up site rubbish. In 1993-94 and 1994-95, US teams removed much of the fuel that remained on site in failing containers.

A joint NZ-US assessment visit in 2001 identified debris and suspected contamination remaining. Further sampling was undertaken the following seasons to better define the extent

of contamination. Based on these investigations, New Zealand and the United States agreed to remove numerous small fuel storage tanks and one large tank, remaining buildings, equipment including two large sleds, a Caterpillar D4 bulldozer, residual debris and the most hydrocarbon contaminated soil from the site.

An ice strengthened ship is required which can get close in to shore and has landing craft or helicopters, as well as cargo lifting equipment and hold space. The Italian Antarctic Programme are assisting the clean up with their vessel *Italica*.

The Latitudinal Gradient Project (LGP), which involves research at Cape Hallett over three summers, currently provides an opportunity to get personnel and limited equipment to the site and to utilize camp facilities during quiet periods. In 2003-04, a team of Scott Base staff, LGP staff and defence force personnel deconstructed the remaining buildings and collected a large amount of ground debris. A total of 22 tons of



*Rebecca Roper-Gee, Environmental and Policy Officer at Antarctica NZ assists with Clean-up.*

materials was staged for removal. This summer a small team will continue collection of debris. It is hoped the wastes can be removed and equipment staged and ready for removal with a 200,000 gallon fuel tank that will be carried out in 2005-06.

## Coldest July on record at South Pole

July 2004 was the coldest July ever recorded for Amundsen-Scott South Pole Station.

The average was  $-88.4^{\circ}\text{F}/-66.9^{\circ}\text{C}$ , beating the old record by more than half a degree F.

This was the second coldest month at South Pole ever, dipping below  $-100^{\circ}\text{F}$  nine times (and the barometric pressure almost set a new record low as well).

The coldest was  $-107.9^{\circ}\text{F}/-77.7^{\circ}\text{C}$ . (South Pole reports that this winter provided ample opportunity for the 300 Club, which had about 35 partakers.)

# PENGUIN DECLINE: Another Impact of Global Warming?

Researchers from the Avian Demography Unit at the University of Cape Town in South Africa suspect that global climate change may be responsible for declining penguin populations on South Africa's Prince Edward Islands which dot the Indian Ocean some 1,770 kms (1,000 miles) off the South African coast.

Most of the islands' penguin colonies are dwindling and one reason for the decline may be a climate-induced, southward shifting of food-rich waters. The change may have forced the seabirds to swim farther to forage. This idea is being tested by researchers who will place electronic tracking devices on the penguins to record



*Adélie penguin. Photo by M. Houston, GCAS photo collection.*

when they go out to sea to get food and when they return. The suspicion is the journeys are now taking longer than they did previously.

The Prince Edward Islands sit near the southern boundary of the Antarctic Circumpolar Current (ACC) these are food-rich waters where the penguins are thought to forage. The southern edge of the current is marked by a boundary separating it

from the cold coastal waters along the Antarctic continental shelf known as the Antarctic Convergence. Waters to the north of the convergence are several degrees Celsius warmer than those to the south. This southern boundary of the ACC is noted for being a food source.

But the boundary is not fixed. It shifts north and south within a range of about 10 - 20 kms (6 -12 miles). Researchers speculate that a southward trending boundary could be adversely influencing penguin colonies on the Prince Edward Islands. Changes in Antarctic ice cycles are also influencing the Adélie penguin colonies that are being studied on the Antarctic Peninsula. Average wintertime temperatures on the peninsula have risen by about 5°C (9°F) in the last 50 years. As a result, pack ice that once formed every winter now has a cyclical nature to it.

Research shows a correlation between pack ice and the availability of algae for krill, a main staple to the Adélie penguin diet. In winter, algae accrete onto pack ice. Later, melting ice makes the algae available to krill during the spring breeding time. Penguins, in turn, eat the krill. When there is no pack ice, there is no algae.

With less food to go around during the ice-free years, fewer penguins survive to adulthood.

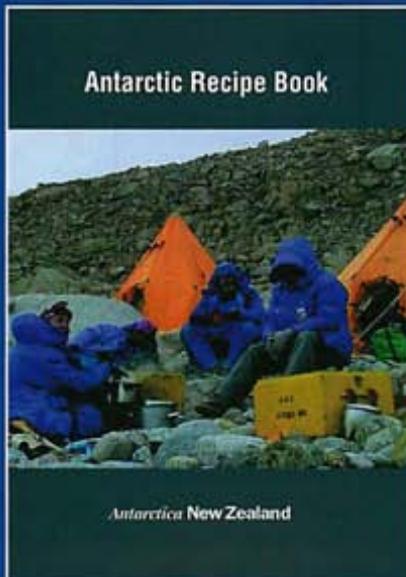
In the last decade Adélie penguin populations have declined by almost 50 percent in the Antarctic Peninsula. In more southerly regions of Antarctica, penguin populations *are actually* getting larger, owing to the warming temperatures.

## Antarctic recipe book to be updated

A number of recipes, hints and helpful suggestions were collected from Antarcians in the 1980s and used to create this Antarctic Recipe Book.

Antarctica New Zealand have reprinted the book for the 2004-05 season and intend to fully update the volume with new recipes and hints for the 2005-06 season. Contributions from any person using the field food boxes along with helpful hints and inventive uses (culinary only) of the contents of the food and kitchen boxes would be gratefully received.

You can contribute to the recipe book by emailing recipes to [webadmin@antarcticanz.govt.nz](mailto:webadmin@antarcticanz.govt.nz) or fill in the recipe form at <http://www.antarcticanz.govt.nz/general-enquiry/>. All recipes contributed must use equipment and ingredients supplied in food and



kitchen boxes and must be either uncooked or able to be cooked on the field cookers supplied to events at Scott Base, Antarctica.

Copies of the Recipe Book are available from Information Services at Antarctica New Zealand.

# Latitudinal Gradients Project

The Latitudinal Gradient Project (LGP) is a framework within which interdisciplinary and international scientific collaborations can be supported logistically, towards the common goals of understanding the complex ecosystems that exist along the Victoria Land coast, and determining the effects of environmental change on these ecosystems.

Approximately 12 science events that are supported by Antarctica New Zealand contribute to the outcomes of these goals in some way. Last season, seven of these undertook research at the first dedicated LGP site at Cape Hallett along with two US events. Four New Zealand and two US events will be returning this coming season to continue their work at Cape Hallett.

## The New Zealand events involve:

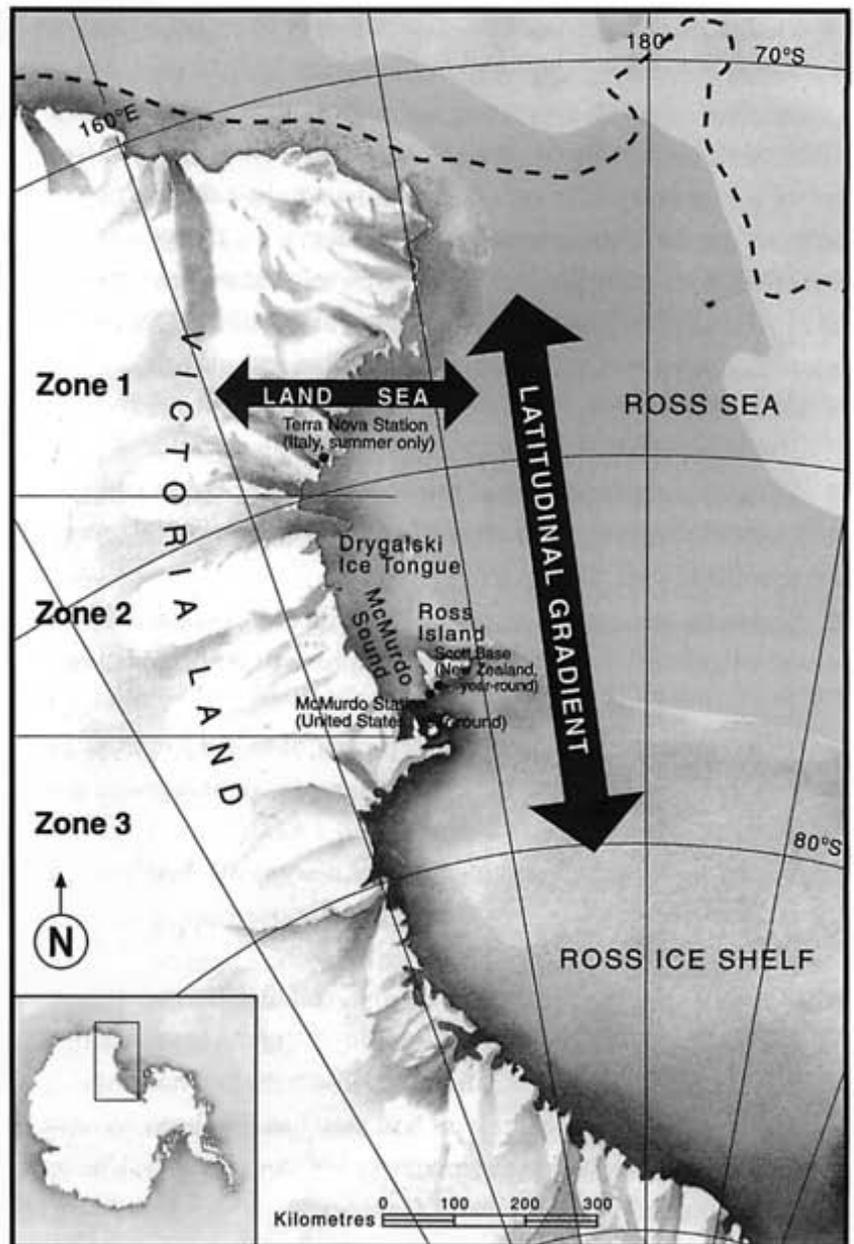
- **Mary Sewell**, University of Auckland, studying latitudinal patterns in the abundance of Ross Sea meroplankton (larval stages of benthic marine invertebrates and fish). Mary hopes to consolidate last year's sampling which showed that there is a diverse and abundant meroplankton community that exceeds that found in McMurdo Sound.

- **Ken Ryan**, Victoria University of Wellington, studying sea-ice, and algal productivity and relating this to climate change. Accompanying Ken is **Andrew Martin**, recipient of the New Zealand Post, Post-Graduate Research Scholarship.

- **Allan Green** (Principal Investigator) and **Catherine Beard** (Field Leader), University of Waikato, working on the mosses and lichens of the area. Last year, Allan's team successfully mapped the growth of the moss and lichen in the Hallett area by comparing current distributions with those mapped in 1964. This year's work will build on this and delve into some physiological aspects of the flora.

- **Jackie Aislabie**, Landcare Research (Principle Investigator) and **Megan Balks**, University of Waikato (Field Leader). Returning to map the soils and hydrology found at Cape Hallett, including the use of measurements from soil peizometers installed last season.

- **Erica Hofstee**, the LGP scholarship award winner working at the LGP site from early December to the end of January 2005.



Scientists associated with two US events related to the McMurdo Dry Valleys Long Term Ecological Research (LTER) project plan a return to Cape Hallett to download data from the Automatic Weather Station they installed last year, to retrieve further snow cores from a nearby glacial accumulation area (which reveal information on recent local climate) and undertake further study of the soil microbial diversity in the area.

The camp at Cape Hallett will be operational from early November 2004 until the end of January 2005. Last year's camp staff, Rachel Brown and Gus McAllister, are returning for their second season.

For further information on the LGP, please refer to the new LGP website at [www.lgp.aq](http://www.lgp.aq). This provides details of the science projects being undertaken, with links to a variety of data, maps and images integral to the project.

# Dick Frizzell to *paint in Antarctica*

Dick Frizzell, one of New Zealand's most well known artists will visit Antarctica this season as Antarctica New Zealand's Invitational Artist.

Painting anything from portraits to abstracts to landscapes including depictions of everyday objects, Frizzell's paintings are filled with images that take on unusual, original and often witty interpretations of his subject matter.

Lou Sanson, CEO of Antarctica New Zealand said the Invitational Artist programme was an opportunity for prominent artists to capture the magic of Antarctica for all New Zealanders.

"I am delighted that Dick Frizzell has accepted the invitation to examine a slice of New Zealand on ice.

"His work captures the essence of our culture with irreverence and humour.

"Whether it's Beehive matches, Fanta, the 4 Square man, tikis or lawnmowers, he has a real talent for turning everyday images into rich cultural icons.

"As Scott Base is another recognisable New Zealand icon, it will be fascinating to see what his time in

Antarctica produces." Dick Frizzell said he has long been intrigued by Antarctica.

"I am really looking forward to letting my instincts loose.

"The signage, the hut exteriors... any clumping of base architecture in the snow... tractors in the whiteness ... I have a haunting image in my head of those massive Russian ice-breaker/cruise ships with their top heavy super structures looming out of the ice ... painting that would be a hell of a statement about how we put ourselves in these awesome environments" said Frizzell.

Dick Frizzell has an exhibiting career that spans over twenty years.

He has won many awards for his work, which is held in a number of major public and corporate collections. In 1997-98 the nationally toured retrospective exhibition *Dick Frizzell - Portrait of a Serious Artiste* traced his career. Previous Invitational Artists to Antarctica include Bill Manhire (New Zealand Poet Laureate), painters Austen Deans, Maurice Conly, Jonathan White and Grahame Sydney and photographer Craig Potton.

Dick Frizzell will visit Antarctica in January 2005.

## WINFLY Success

The first flight to Antarctica departed from Christchurch at 6 am on 20 August, the first contact that the people of New Zealand's Scott Base and the US's McMurdo Station have had since closing for the winter.

The annual winter flight programme, known as WINFLY, coincides with the first sunrise over the Ross Sea Region. Four C17 flights were carried out over the six-day period supplying both the New Zealand and US Bases with science equipment, building and maintenance supplies along with fresh food, mail and key personnel for the forthcoming summer season.

"WINFLY is the curtain-raiser for the start of the Antarctic season. After many months of planning and weeks of total darkness, the first flight is always a welcome sight for the staff at Scott Base and McMurdo Station", said Lou Sanson, CEO of Antarctica New Zealand.

Scott Base Winter Manager Dan Mathers said this year's winter staff have worked particularly hard keeping Scott Base operational and repairing damage from the biggest storm to hit Scott Base in 30 years.

Summer science activities also begin to gain momentum following on from WINFLY.

## ICY SLIPS

The details included with the review of "Postmarks of the Australian Antarctic Territory 1911-2004" were incorrect.

The book can be ordered through Peter Cranwell Book-seller, PO Box 620, Rosanna, Victoria 3084, Australia.

His email is pcranwell@optushome.com.au

## Antarctic Treaty Secretariat begins work

The first Antarctic Treaty Executive Secretary, Jan Huber, who was nominated and appointed during the XXVII Antarctic Treaty Consultative Meeting held in Cape Town, South Africa between May and June 2004 took up his office in early September.

Mr. Huber began working in the permanent Secretariat office located in downtown Buenos Aires, Argentina.

The Secretariat's main activity will be in support to the Antarctic Treaty Consultative Meetings (ATCMs) and the Committee for Environmental Protection Meetings (CEP) which are both held annually in one of the Antarctic Treaty Consultative Party States.

The first challenge for Mr. Huber and his staff will be contributing to the organization of the upcoming XXVIIIth Consultative Meeting scheduled to take place in Stockholm, Sweden, in 2005.

Other duties include the development and upkeep of data bases with the purpose of improving communications between the Consultative State Party members, as well as collecting and distributing meeting information and archives which are recorded in the four official languages of the Antarctic Treaty (English, Spanish, French and Russian).

For more information about the Antarctic Treaty Secretariat's activities go to: [www.ats.org.ar](http://www.ats.org.ar).

# The Hurley Photographs

'The Observer' of Sunday 22 August 2004 published an article by Vanessa Thorpe based on an interview with a surviving member of the Shackleton Expedition, which alleged that Frank Hurley, cameraman from the expedition, fabricated scenes and doctored images from the voyage.

The article is reproduced here with permission.

Comments on the story and on Hurley's work were obtained from Leslie Roberts, Visiting Instructor, Department of Rhetoric, University of Iowa and Kerry McCarthy, Curator of Pictorial Collections, Canterbury Museum, and PhD candidate at Gateway Antarctica. Thanks to both Leslie and Kerry for their opinions and for adding to this new "Forum" section of ANTARCTIC.

An Antarctic survivor says famed cameraman Frank Hurley fabricated scenes and doctored images, Vanessa Thorpe, arts and media correspondent has reported in 'The Observer' newspaper:

They are the photographs that show what is perhaps the greatest story of endurance and valour ever told, the epic narrative of Ernest Shackleton's near-fatal Antarctic expedition of 1914.

The explorer's desperate bid to save the lives of his crew has been hailed as the epitome of human achievement against the odds, while the arresting images captured by Frank Hurley's camera have ensured that the historic events have kept an icy grip on public imagination.

"But now it has emerged that the iconic photographs, among the most valuable ever taken, are not all they seem. New evidence and testimony from a surviving eyewitness reveal that Hurley, the pioneering Australian cameraman and adventurer, fabricated scenes and doctored images.

The poignant photographs recording Shackleton's departure from Elephant Island and the return of his rescue party in 1916 are both misrepresentations of what actually happened. Hurley's frequent use of 'artistic licence' was confirmed this weekend by the last remaining survivor of an Antarctic mission that was *officially* photographed and filmed by Hurley.

Australian Alf Howard, 98, was a young chemist in 1929 when he won a crew place on Robert Falcon Scott's

former vessel, Discovery, which was to be taken back to Antarctica by Douglas Mawson. 'I was told there was an expedition that needed a chemist to look into the properties of sea water, so I jumped at the chance,' said Howard, speaking from his home in Melbourne last week.

"Until that point he knew little about Antarctica and had not heard of Hurley, who was already revered by photographers for his work on Mawson's 1911 voyage and Shackleton's ill-fated Imperial Trans-Antarctic Expedition.

'We were finding new things every day, and discovering new lands,' said Howard, remembering the trip that gave him a lifelong love of Antarctica. He also struck up a firm friendship with Hurley, whose darkroom door opened into his own laboratory on Discovery. 'Frank was very easy company,' said Howard. 'He was older than me, but a comedian, always up to some sort of trick. He was the life of the party.'

Howard recalls an occasion at the wardroom table when smoke started to come out of one crew member's ears. It turned out to be an illusion set up by Hurley with the aid of a cigarette and a piece of rubber tubing. It was a playful attitude that extended into Hurley's work, Howard says in a BBC documentary to be screened tomorrow.

He would not go against the truth, but he would do anything to highlight a particular point,' said Howard this weekend. 'He would modify the background to a picture. He had a

very good idea of what the thing would look like.'

The well-known image of Shackleton's departing open boat is one of those later embellished in the dark room by the addition of a brooding cloudscape, according to the team behind the documentary. The picture is a key element in the detail of a heroic rescue mission. After 326 days trapped in the ice, Endurance was crushed in the melting spring ice. The 28-man crew lived for five months on the ice, then made a perilous seven-day journey to the nearest land mass, where they were left by Shackleton and two others, who went for help.

The picture of Shackleton's crew, marooned on Elephant Island, joyfully greeting their returning leader is also a piece of historical fakery. It was, in fact, a picture taken at the time of Shackleton's departure. Howard admits Hurley was 'very good at manipulating' images, but he says there was always a good reason. 'He would superimpose images, but I don't think he ever tried to alter the outcome.'

Howard believes the fakery is often there for the trained eye to spot. 'If you're looking for it, you can tell whenever there's not a complete continuation in the background. If he's got two or three birds in together and then another bird which is offset from that, I'll look for where there's a break in the background.

'The same thing applied to his war photography later. If he could get two bunkers into a picture and make a more realistic picture, well, OK.'

Hurley was also prepared to stage reconstructions if an incident was too quick for his lens. Once, Howard remembers, an albatross was caught and brought on board Discovery. It pecked Howard and Hurley restaged the event, making a tear in Howard's shorts to add a little comedy.

The pressure was on Hurley to make money for the expedition from photographs and films. The words, 'Near enough is not good enough,' were scratched into the wood over his dark room and he took great physical risks to get a dramatic shot.

Howard remembers Hurley going anywhere on the ship in search of the right image. He would even climb to

the end of the yardarm. 'One of his main things was to go off to the crow's nest and then take a rod above that and stick it up above the crow's nest and then put the camera on that,' said Howard. 'Then he'd be able to photograph the whole of the ship from above.' Howard took Hurley's place providing the live voiceover to public screenings of the footage from Antarctica in Sydney, Melbourne and Adelaide. By the end of the run, auditoriums were packed. For Howard this was testament to Hurley's skill. He may have sometimes used trickery, but he was always there to watch events unfold: 'He always had a camera with him as he moved around the deck, looking for opportunities to take something.'

#### Kerry McCarthy Comments:

*I think it has always been pretty well known that Hurley's photographs were composed and staged. The implication in the Observer story that this is a new revelation is a bit misleading - and another example of the need to construct an understanding of events in a way that will make the story sell - just what Hurley was doing. Of course, he also took his work as a photographer very seriously, so ensuring appropriate composition, and aesthetic and visual quality was important to him.*

*I think it's interesting that people have this need to construct photographs as "truth", and feel disappointed and somehow cheated when they discover that a photographer has intervened to influence the "reality" they (want to) perceive. Written stories are willingly accepted as*

*the author's interpretation of events and, really, photography is no different. The technical abilities of the photographer and the objectives and motivation behind the events recorded will influence the end result, just as they would in a newspaper article or an autobiography.*

*The constructed nature of Hurley's work and the purpose behind it are two of the many layers of meaning that can be found in his images. They demonstrate clearly that photographs are more than just supporting documents for text. They determine the perception and transmission of history in a very fundamental way.*

*In fact, the overt manipulation of images for a particular effect or purpose by photographers such as Hurley, in some ways makes them simple to interpret. Every photograph is constructed, by the photographer and by the things, people and events photographed. Understanding the motivations and decisions involved in this process for amateur, snapshot-type photographs is more complex, and that's why I'm focusing on them in my PhD. Hurley's objectives and decisions are writ large in his exquisite images, but what were the values and decisions behind the blurry photos of ponies and penguins and friends taken by a now anonymous crew member? Is there anymore "truth" to be found there? I don't know....*

#### Leslie Roberts Comments:

*It is particularly interesting that we make these representational demands on Hurley and his work vis a vis Endurance. I do not recall ever seeing Frank H stating that he meant to be a news photographer down there—he was sent to docu-*

*ment an expedition and it was their primary way of making money once they returned—this has to be kept in mind—they needed those photos to sell, so he had to play to the audience.*

*Frank Hurley defined how expedition photographs tell a particular type of heroic tale—even when facts and common sense suggest otherwise.*

*But I would argue it is that tension that makes Hurley's Endurance shots so very, very compelling. Men were losing their minds, starving, without hope. But there they all were, waving goodbye like they were standing at Paddington Station saying g'day to Auntie Vi. It's the sort of bravery not often discussed: not triumph in the face of adversity, but a version of the show must go on—they all knew what they were most likely performing: death in a distant corner of a frozen world.*

*At what point do we get bothered about composed work? There are so many steps in the process. Conditions for photos are rough down south, so much light.*

*In truth, I find Shackleton's methods for making his books far more disingenuous—he presents his adventures as though they were written by him alone. They were not.*

*He used Frank Worsley's journals for factual citations on place, weather, seas, etc, and relied on the Kiwi journalist Saunders to get the story down onto the page. Why this process, of using another person to write your "first person account" doesn't need to be mentioned to a reader is one more example of the selective way histories are unpacked and analyzed.*

## Mars exploration has Antarctic Connection

Perched on the edge of a 130 metres (430-feet) wide crater, the Mars rover named "Opportunity" recently spied a new trove of rocks that promises to tell a richer, deeper story of the planet's geological past.

The NASA mission's principal investigator, called the high-resolution colour panorama of the crater "surely the most spectacular image yet from this mission." The connection to the Antarctic is that the crater is named "Endurance" after Sir Ernest Shackleton's ship in the 1914-1917 expedition.

Opportunity rover spent several weeks circling the outside of the Endurance crater, which is approximately 20

metres (66 feet) deep, with slopes of 20 degrees or greater.

Geologists wanted to examine the crater's bedrock with a suite of instruments on the Opportunity.

The purpose of the mission to Mars is to look for signs that the planet was once much warmer and wetter than it is today, perhaps even an environment amenable to life.

The Opportunity crawled out of its first crater in March, and then headed east towards the Endurance crater, almost half a mile away.

The Endurance crater exposes the same bedrock layers seen previously, but also reveals deeper layers. Yet another connection between Antarctica and outer space!

# NATIONAL ANTARCTIC Programmes begin new summer season



Digging out Vostok Station after its winter closure.

It's the start of the Antarctic summer research season for 2004/05, below are a few details from various National Antarctic Programmes.

## BRITAIN

The British Antarctic Survey (BAS) research programme is planned on a five-year timetable. The current programme is described in *Antarctic Science in the Global Context, 2000-2005*.

The programme was based on proposals from staff. After international peer review, the most highly rated were integrated into the Survey's infrastructure capability. The outcome is a suite of nine programmes complemented by projects in the medical and environmental sciences and independent research activities.

BAS employs over 400 staff, and supports three stations in the Antarctic, at Rothera, Halley and Signy, and two stations on South Georgia, at King Edward Point and Bird Island. The Antarctic operations and science programmes are executed and managed from Cambridge, UK.

Ice-strengthened ships sustain the Antarctic operations. RRS *James Clark Ross* has advanced facilities for oceanographic research. RRS *Ernest Shackleton* is primarily a logistics ship used for the resupply of stations. The Royal Navy's Ice Patrol Vessel *HMS*

*Endurance* has helicopters and provides valuable logistic support.

Four Twin Otter aircraft fitted with wheels and skis are operated from Rothera and Halley, while a wheels-only Dash-7 aircraft provides the inter-continental air-link from Rothera to the Falkland Islands, and flies inland to blue ice runways.

## CHILE

In November, Chile will join the global research effort on the effects of global warming in the Antarctic. A 12 member-team of military and science personnel will travel more than 2000 km in 30 days.

The 1,084 km long traverse will depart from Patriot Hills. The distance will be covered in ten days following meridian 83W and the means of transportation will be a (caterpillar) tractor TL-6, purchased in Sweden and specially designed for these kind of trips - no fuel refill will be required during the entire journey.

Gravity measurements will be made every 20 km on the way to the South Pole, as well as Global Positioning System checks. The same group will return from Amundsen-Scott South Pole Station to Patriot Hills.

The expedition will count on the support of Chilean Air Force planes, which will transfer the expedition

members from Punta Arenas to Lieutenant March Base and then to Patriot Hills.

At the same time, the Chilean Army announced the beginning of the Second Scientific flight over Antarctica, in agreement with NASA, to determine the changes in elevation of the ice-masses.

## CHINA

A team of 12 scientists and journalists will attempt to conquer the highest polar icecap peak (4,300 metres above sea level) during a 150-day Chinese Antarctic expedition that will begin in late October 2004.

China will also invest more than 200 million yuan (about 24 million US dollars) to rebuild the polar expedition ship, *Xuelong*, which will participate in the 21st Antarctic expedition. After the rebuilding, the *Xuelong* will have an increased laboratory area of 300 square meters, and its capacity for scientific research, safety and living conditions will all be improved. China inaugurated its first Antarctic research station, Changcheng (Great Wall), on February 10, 1985, and since then the country has launched an Antarctic expedition every year.

## NORWAY

From February 2005, year-round operations at the Norwegian Antarctic research station, Troll, will commence. An airstrip beside the station will also accommodate intercontinental flights between South Africa and Queen Maud Land. In the past, only smaller flights could land on the airstrip out by the blue ice. The flight from South Africa will take only 6 hours. The Norwegian research community already has a great presence in the Arctic, and has several cross-functional research communities that are among the world's leading in their areas.

These functional communities have potential to contribute greatly in the Antarctic.

This bi-polar approach gives Norway a unique opportunity to contribute to the comprehensive knowledge exchange between the Arctic and

Antarctic, not least of which in comparative studies.

Currently Norway is the only nation that maintains a territorial claim to a portion of Antarctica that does not have a station opened year round.

Traditionally Norwegian research in Antarctica was focused on biology, geology, oceanography and glaciology.

Now research will include studies of international politics as well as cultural conservation and tourism.

Other themes to be included are in the area of atmospheric research, research of greenhouse gases and studies of the ozone layer.

The new logistic situation opens the way for more flexible activities in both marine and terrestrial areas, besides opening new climate and ecosystem models as well as an approach to models that will combine existing and new knowledge and different types of data.

## RUSSIA

The 50th Russian Antarctic Expedition (RAE) is planned to depart for Antarctica aboard the research vessel Akademik Fyodorov at the end of October, after the ship returns from the Arctic.

The Russian Government has recently approved the 350 million roubles budget (\$US 12 million) for the upcoming season.

This is an increase from last year's budget and it is therefore hoped that the upcoming season will see investment of resources towards the finalisation of the construction of a snow-and-ice-surfaced airfield and a new wintering complex at Progress Station on coastal Antarctica.

At the end of the summer season last year, 600 tonnes of construction materials were delivered to Progress Station for the new wintering complex. Update on Vostok Station: On December 30, 2003 a sledge-caterpillar traverse arrived at Vostok Station from Mirny Station in order to reopen Vostok after it was temporarily closed down in February 2003.

In addition to mechanic-drivers, Vostok station personnel also arrived with the traverse providing for a sufficiently rapid recommencement of

functioning of all services and laboratories.

## THAILAND

When Voranop Viyakarn takes his first step in Antarctica later this year, it will be the first leap onto the icy continent for both Thai scientists and Thai robots.

The first diving robot ever invented by Thai scientists for use in Antarctic exploration will act as a survey assistant for Voranop Viyakarn, the first Thai to conduct research in the south polar region. The coordinator of the Thai Polar Research Project, said that Voranop, a marine science lecturer at Chulalongkorn University, Thailand, will join a 65-member Japanese research mission organised by that country's National Institute of Polar Research. Voranop will conduct research on the Antarctic aquatic ecosystem and its effect on the distribution of marine life and the food chain.

The remotely operated underwater vehicle, capable of operating in the cold waters that range from 30 m to 50 m in depth under Antarctica's ice sheets, weighs 50 kg and cost Bt2 million (\$US 50,000) to develop.

An underwater camera attached to the remotely controlled submersible

will be used to observe the flora and fauna of the Southern Ocean.

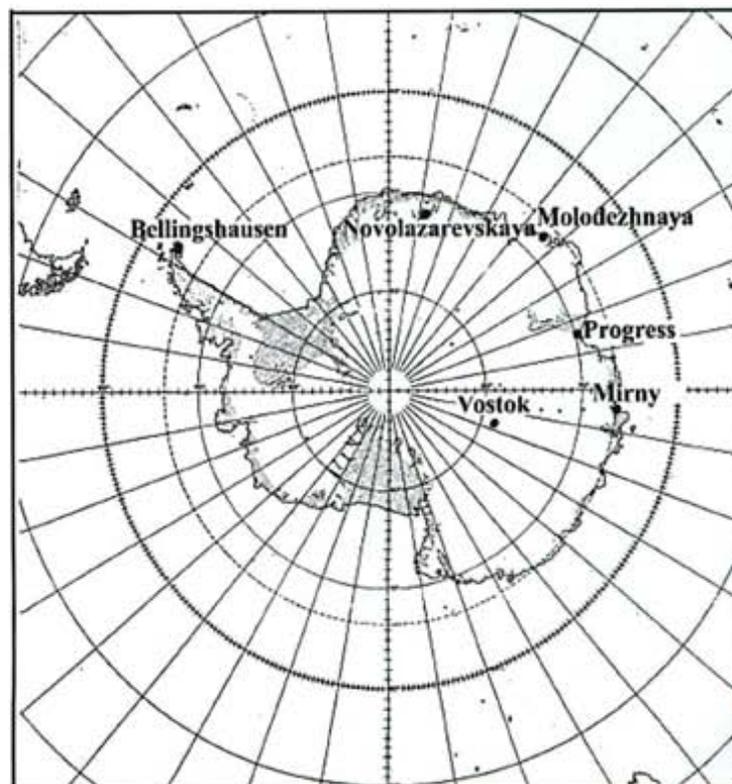
Voranop and the Japanese team will leave for Antarctica in November and will be based at Japan's Showa Station until they return in February 2005.

## UNITED STATES

The first flight to Antarctica for the US Antarctic Program will head south on 5 October. This summer the USAP will operate using C-17 and C-141 aircraft. This could be the last year that the C-141's are flown to Antarctica as they are being phased out of the program.

Art Brown will once again be the National Science Foundation Rep based in Christchurch, New Zealand and he will be based out at the International Antarctic Centre for the austral summer.

The 2004/05 season should prove to be a busy one, with an airlift schedule that includes a number of missions planned to transport material for project ICE CUBE at the South Pole. The Royal New Zealand Air Force 40 Squadron will fly 15 missions to Antarctica during the November/December timeframe.



*Russia's Antarctic bases. More information on the Russian Antarctic Programme can be found at <http://www.aari.nw.ru/>*

# Imprints in the Ice

## 1911-12, 1912-13, 1963, 2001

By Anne Hunter (nee McDonald)

A shipmate's entry, April 1912, is still bright in Grandad's autograph book. The intrigue of the Southern Ocean, which lured the young man to Antarctica, jumped the decades to 2001 when I followed in his wake.

My grandfather, William McDonald, began his sea-faring career as a 15 year-old Captain's Boy on coastal shipping out of Glasgow, and immigrant ships to Australia.

In London in 1910, teenage Bill was one of 8,000 hopefuls keen to join Captain Scott's British Antarctic Expedition. After working his passage to New Zealand a year later, he received a telegram from Commander Harry Pennell: "*probable vacancy if desire to join*". He signed on as Able Seaman on the *Terra Nova*, departing from Lyttelton, New Zealand, on the



Anne Hunter in Cape Evans Hut.

resupply voyages of 1911-12 and 1912-13. Threads of Antarctic adventure were woven through my Christchurch childhood. My siblings and I would spend stuffy Sundays on best behaviour, lined up on the red roll-armed sofa in our grandparents' living room. A welcome diversion was the glass case which housed a weatherworn Adelie penguin, still guarding a pair of eggs. One was cracked: would the chick *never* hatch? Grandma always said that oil seeped from the penguin's feathers at certain times of the year even after half a century of dehydration. On New Year's Eve the family would gather at their home to enjoy musical items until it



VETERANS OF CAPTAIN SCOTT'S LAST EXPEDITION BACK IN THE ANTARCTIC. - Mr M McCarthy (left), Mr W. McDonald (middle), and Mr W. Burton looking at a 1908 copy of "The Weekly Press" during a visit to Scott's hut at Cape Evans. The men were members of the crew of the *Terra Nova*, which took Captain Scott's last expedition from New Zealand in 1910. They revisited the Antarctic as guests of the Americans. - United States Navy Photograph.

was time to join hands for Auld Lang Syne. Our cousins from Dunedin ("the Edinburgh of the South") were nimble footed Highland dancers, and the *Terra Nova* hatband proudly trimmed the Sailor's Hornpipe uniform.

Like all good sailors, Grandad had an anchor tattooed on his arm. He was a heavy smoker of roll-your-owns. His cup of tea had to be loaded with "two and a bit" spoonfuls of sugar. He told us little about his exploits: by the time we were growing up, Antarctica and WW1 were a long time distant for this old sailor/soldier with a Gallipoli leg injury.

In 1963 the United States Navy took the three surviving New Zealand crew from the British Antarctic Expedition for a nostalgic return visit. It was a wonderful trip for 70 year-old Grandad and his two elderly comrades, Bill Burton (74) and "Mac" McCarthy (84). They were VIP's on the ship and were taken by helicopter to the historic sites, places they'd never dreamed of seeing again. My favourite photo shows the trio clustered round the table in the

hut at Cape Evans, reading a 1908 "Weekly News". Since then, I've taken up the call to retrace his 90 year-old footsteps, sailing with Heritage Expedition's "In the Footsteps of Scott & Shackleton" voyage to the Ross Sea. Departing from Bluff, at the southern tip of New Zealand's South Island, we rock and roll through the vast grey Southern Ocean with only the seabirds for company.

It's a thrill to spot the first iceberg as the temperature plummets, and next day we celebrate crossing the invisible Antarctic Circle. Expedition Leader Rodney Russ plants a penguin stamp on our foreheads as we each solemnly declare "*to advocate to all who will listen, and even those who won't, by whatever means at my disposal the need to protect and preserve the Antarctic Continent and the surrounding seas forever.*"

Believing that education is the key to preserving the environment, he and his team inspire us with their passion and vast knowledge of the bottom of the world.

Our group of 44 shipmates are an international mix, all about to be in-

fect, if not already, with *Antarcticitis*. It's that fascination for a beautiful but inhospitable continent which has drawn us together. Like me, Anne Edgeworth is retracing the footsteps of her grandfather, Edgeworth David, geologist on Shackleton's *Nimrod* Expedition of 1907-09, while other passengers have relatives with links to Antarctica.

Grandad's log opens at "Lyttelton to Cape Adare", and his hand drawn chart of this section of his voyages hangs in our living room. A week after leaving New Zealand, I wake up to the silent stillness of the ship at anchor. From the comfort of my bunk I see the dark volcanic cliffs of Cape Adare. Antarctica! The *Terra Nova* anchored here in January 1912 to collect 6 members of Scott's Northern Party who "were in the very best of health and had done some very valuable work after being camped at Cape Adare for over 12 months."

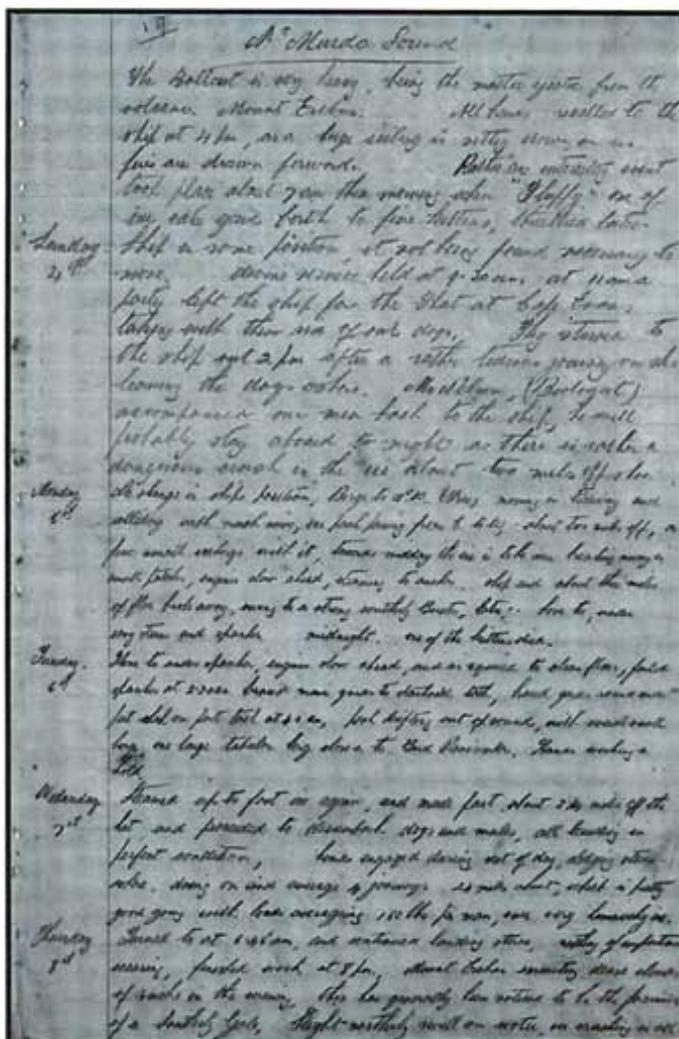


William McDonald, aged 19, at sea.

We zoom ashore in inflatables and are intrigued by the Adelie penguins. Borchgrevink's 1899 hut, built of Norwegian spruce in "lockwood" style, is relatively intact. Not so Scott's 1910 hut: only the porch is erect. Some of us climb 1000' up the cliffs to the lonely grave of Nicolai Hanson, biologist on Borchgrevink's expedition. Our reward is a fantastic panorama of mountains and sea, icebergs, and the tiny speck which is our ship.

In the small hours of the morning I sleepily respond to the call that we're about to land at Cape Hallett. Exhausted from days of excitement and the exercise at Cape Adare, I struggle into layers of warm clothing and stump on to the deck. By this time the naiads have already left, but I'm content to stand on deck in the grey mist and guess where Mt McDonald might lie. The Tararua Antarctic Expedition of the Federated Mountain Clubs of NZ in 1962-63 surveyed Mts McDonald, Burton, and McCarthy.

We spend a wonderful week in the Ross Sea. I trace the Captain's chart on the bridge. Names like Inexpressible Island, Granite Harbour, and Butter Point leap from Grandad's log, each with its own amazing tale to tell. "We are now running alongside the famous Drygalski Glacier, a marvellous accumulation of ice, starting at the top of Prince Edward Mountain and running at least 40 miles to sea, with a wonderful irregularity." We marvel at the painted sunsets and a huge pale orange moon, the deep green hues of icebergs, the happy antics of the penguins, the wisp of steam from Mt Erebus, the magnificent landscapes, and best of all, the sight of a pod of orca flipping through the water with drops of sunset glistening red on their backs. No one managed to capture that on film. In Terra Nova Bay we're treated to coffee and a guided tour of the Italian station. The orange and blue buildings are arranged in tidy rows. Nearby, on 8<sup>th</sup> January 1912, just four



A page from William McDonald's log from the 2nd voyage of the *Terra Nova*, 1911-12.

days after picking them up from Cape Adare, the *Terra Nova* "landed Mr Campbell's party of 6 men who are going on a 6 week sledging journey for meteorological observation". A plaque now marks the site of the cramped ice cave on Inexpressible Island where this unfortunate group spent a harsh winter: 6<sup>th</sup> March, 1912: "it is impossible for ship to approach western shore to pick up party of men at Evan's Cove.....on account of heavy ice, which might mean the ship being caught, ship's head is turned homeward towards New Zealand."

And then the highlight: Scott's hut at Cape Evans. The *Akademik Shokalskiy* anchors about 5 miles from the hut. We ride over the ice in two naiads, each mounted on a sledge and pulled by an Argo all-terrain vehicle. I huddle behind my shipmate and visualise "crew engaged sledging provisions". There is a narrow tide crack to cross by boat and then a short walk

Continued to Page 57

# 2004/05 Science Events

The New Zealand Antarctic Summer Season will be a busy one. Below are the projects planned, the area where the research will be carried out and the Principle Investigator or Project Manager.

- Event K001 McMurdo Ice Shelf - Jim Cowie  
*ANDRILL*
- Event K002 Cape Hallett- Shulamit Gordon  
*Latitudinal Gradient Project (LGP)*
- Event K015 Explorer's Cove- Dr Paul Augustinus  
*Development and Dynamics of the Fossil New Harbour Marine Deltas*
- Event K018 Cape Hallett- Dr Mary A Sewell  
*Latitudinal Patterns in the Abundance of Ross Sea Meroplankton*
- Event K023 Tramway Ridge, Miers Valley- Professor Craig Cary  
*Microbial Biodiversity and Metgenomics of the Ross Desert, Eastern Antarctica*
- Event K024 Cape Hallett- Professor T G Allan Green  
*Biodiversity and Performance of Lichens and Mosses*
- Event K027 Shell Glacier- Dr Joseph R Waas  
*Long-Term Impacts of Human Disturbance on Breeding Adélie Penguins*
- Event K028 Darwin Glacier- Dr Ian Hogg  
*Terrestrial Biodiversity in Southern Victoria Land*
- Event K030 Cape Bird- Professor David M Lambert  
*Molecular Ecology of Antarctic Fauna*
- Event K034 Mandible Cirque, Cape Washington- Dr John F Cockrem  
*Stress and disease in Adélie and Emperor penguins*
- Event K042 Cape Roberts- Mr Alex R Pyne  
*Cape Roberts Tide Gauge*
- Event K043 Cape Hallett- Dr Ken Ryan  
*Antarctic Sea Ice, Algal Productivity and Global Climate Change*
- Event K047 Victoria Valley, Beacon Valley- Dr Warren Dickinson  
*Dating Relict Ice in the Dry Valleys*
- Event K049 Cape Evans, Piedmont, Erebus- Ms Nancy Bertler  
*NZ ITSE-Climate Variability Along the Victoria Land Coast*
- Event K052 Garwood Valley- Dr Ashley Sparrow  
*Natural Spatial Subsidies in Continental Antarctic soil*
- Event K053 MIS/Koettlitz Glacier- Dr Wendy Lawson  
*Ice Shelf Sensitivity and Change*
- Event K055 Arrival Heights- Dr Adrian McDonald  
*Dynamics and Ionisation in the Antarctic Middle Atmosphere*
- Event K056 Teall Is, Gneiss Pt, L. Vida, TNB- Ms Christine Elliott  
*Influence of Moisture on Rock Weathering Processes*
- Event K057 Fishing South of Cape Armitage- Associate Professor William Davison  
*Temperature and Cardiovascular Physiology of Antarctic Fish*
- Event K061 Terracotta Mtn, Mt Gran- Dr James D L White  
*Magma-Supply Dynamics of the Ferrar Large Igneous Province*
- Event K062 Mt Morning, Minna Bluff, Skelton Glacier- Professor Alan Cooper  
*Magmatism of the McMurdo Volcanic Group*
- Event K063 Capes Bird, Royds, Crozier- Dr Lloyd Davis  
*Effects of Marine Productivity on Reproduction in Adélie penguins*
- Event K064 Victoria Upper/Wright Lower- Dr Sean Fitzsimons  
*Behaviour of Cold-Based Glacier*
- Event K065 Southern McMurdo Ice Shelf- Andrew Clifford  
*Physiography, Flow Characteristics & Vulnerability of the S. McMurdo Ice Shelf*
- Event K068 Capes Armitage, Evans/Cinder Cones- Dr Miles Lamare  
*Effects of Increased UV-B Radiation on Invertebrate Larvae*
- Event K069 Arrival Heights- Professors Brian Fraser & Richard Dowden  
*Monitoring Magnetosphere-Ionosphere Coupling and Space Weather*
- Event K073 Scott Base- Dr Gary Steel  
*Examining the Values of Visitors to the Ross Sea Region*
- Event K081 Wright/Taylor/Victoria Valleys- Dr Ian Hawes  
*Antarctic Aquatic Ecosystems (Inland)*
- Event K082 Cape Evans- Anna Schwarz  
*Antarctic Aquatic Ecosystems (Coastal Marine)*
- Event K085 Arrival Heights- Dr Stephen W Wood  
*Drivers of Global Change in the Antarctic: Atmospheric Remote-Sensing*
- Event K087 Air Sampling- Mr Gordon Brailsford  
*Drivers of Global Change in the Antarctic: Atmospheric Air Sampling*
- Event K089 Arrival Heights- Mr Andrew Harper  
*Climate Data Acquisition - Scott Base and Arrival Heights*
- Event K122 Cape Bird, Cape Hallett- Dr Peter Wilson  
*Adélie penguin Population Dynamics*
- Event K123 Cape Hallett, Dry Valleys- Dr Jackie Aislabie  
*Environmental Protection of Antarctic Soils*
- Event K131 McMurdo Sound traverse- Dr Timothy G Haskell  
*Sea Ice and Southern Ocean Processes*
- Event K141 Scott Base- Azizan Samah  
*Malaysian Antarctic Programme*
- K142 Victoria Valley, Packard Glacier- Dr Hamish McGowan  
*Frozen Dunes: an indicator of climate variability*
- Other work of Antarctica New Zealand staff include environmental management and monitoring projects, Antarctic Treaty Inspection Party to conduct inspections on bases at Vostok, South Pole and Scott Base, construction of Warm Store/ Field Store facility and education initiatives including Project K - Youth on Ice and the Graduate Certificate in Antarctic Studies course.

# UK Abandoned Bases Project

The UK is undertaking a major five-year programme to remove abandoned British stations and waste dumps from Antarctica, in accordance with the Protocol on Environmental Protection to the Antarctic Treaty, which came into force in 1998.

The bases and dumps are spread over a wide geographical area and some date back to the mid 1950s.

Their clean up represents a significant logistical challenge for the UK and will cost £2 million.

In March and April 2004 Antarctica New Zealand's Environmental Advisor, Rebecca Roper-Gee, joined the British Antarctic Survey's (BAS) clean up voyage to the Antarctic Peninsula aboard the *Ernest Shackleton* as an independent observer. Two abandoned bases were completely removed during the trip, and further work undertaken at two designated historic sites.

At Danco Island, a camp was established and a shore party of twelve undertook demolition of the Base O Hut and removal of a coal dump, burn sites and other outdoor items over a three-week period.

Many items of historic interest

were retained and packed for display at Port Lockroy and Stanley Museum in the Falkland Islands and deposit at BAS Archives.

The hut which was demolished at Prospect Point (Base J) was identical to that at Danco Island but in consid-



*BAS Base in Antarctic Peninsula scheduled for Clean-up.*

erably worse condition, with much of its structure and contents rotten and disintegrating. Surprisingly, several cases of food in good condition were found, including sufficient ingredients to bake a loaf of bread! A coal dump and rubbish dump were also removed. At these sites only the building foundations now remain. Rebecca provided an audit report to BAS on their clean up operations, and brought back plenty of new experiences and ideas for New Zealand's clean up efforts.

## NEW STAFF



Miranda Huston (pictured above) is the new Environmental Compliance Officer for Antarctica New Zealand.

She has worked on fixed term contracts for both the Environmental and Science departments of Antarctica New Zealand since 2001.

Her new position encompasses the managing of Antarctica New Zealand's waste management programme, the coordination and provision of annual environmental impact assessment processes for activities supported by Antarctica New Zealand, the development and maintenance of an operational fuel spill contingency plan, as well as a number of other projects.

## Hillary Plans Voyage of Remembrance

It was announced that Sir Edmund Hillary will travel to Antarctica this November.

He is to feature in a television documentary about the New Zealand base he and the New Zealand team helped establish, and the significant role Kiwis play on the Ice.

The documentary will focus on the 50th anniversary of New Zealand's Scott Base in 2007.

Hillary's visit will also coincide with the 25th anniversary of the Mount Erebus air tragedy of November 28, 1979, in which 257 aircraft passengers and crew lost their lives.

Hillary said "It very likely will be my last trip down there. I don't really know, but it's fairly probable. I've been there quite often over the last 10 years. I don't think it will be a sad moment.

A lot of it will be a very cheerful and happy occasion, apart from the sadness as far as the crash was concerned." Hillary, accompanied by his son-in-law, David Hayman, will take some time at Scott Base and look in on the scientific work being done on the Ice by New Zealanders. He acknowledges that the 50th anniversary of Scott Base will be a special milestone.



## Food Growth Chamber offers physical and psychological benefits

By Susan McGinley. Reproduced with permission from the University of Arizona College of Agriculture and Life Sciences. (Abridged)

Fresh produce doesn't come to mind when you hear the word "Antarctica". Researchers living there usually eat packaged food year round indoors. They can suffer from seasonal affective disorder (SAD), a health malaise brought on by a lack of full spectrum natural light, and they long for the sight, taste and touch of plant life in the most isolated place on earth. They've also learned that having access to plants can raise morale and increase productivity.

For these reasons, personnel based at the new Amundsen-Scott research station at the South Pole will be growing and harvesting their own salad vegetables in a special high-technology facility designed, built and tested by the University of Arizona (UA). Scientists from the Controlled Environment Agriculture Center (CEAC) in the College of Agriculture and Life

Sciences are collaborating on the project with Phil Sadler, of Sadler Machine Company in Tempe, Arizona. "The main purpose for including the food growth chamber in the new station is the psychological effect that it has on the station personnel," says Gene Giacomelli, UA professor of agricultural and biosystems engineering, and director of the Controlled Environment Agriculture program at the UA.

"They are totally isolated in a frozen, 9,000-foot elevation desert of snow, 800 miles from the coast of Antarctica, where temperatures can reach lows of minus 118 degrees Fahrenheit. For seven to eight months of the year, temperatures are so low that aircraft cannot land and no one can come or go."

The self-contained unit will feature a food growth chamber equipped for raising leafy greens and fruiting vegetable crops hydroponically, separated by a transparent wall from a sitting room where researchers can relax and enjoy the sight of lush green plants.

Lettuce, herbs, tomatoes, cucumbers, and sweet and hot peppers will be grown in a recirculating nutrient solution. Automated controls for air temperature, light, humidity, watering and nutrients will enable researchers to raise and eat their vegetables year-round. The chamber is part of a new South Pole research station that will be officially commissioned in 2004 by the National Science Foundation (NSF), which directs activities of the United States Antarctic Program.

The NSF is constructing a replacement for the existing station with the assistance of its civilian contractor, Raytheon Polar Services Company (RPSC). The South Pole Food Growth Chamber Project was initiated by the NSF, which RPSC competitively bid, and the UA ultimately won. The UA must build and deliver an operable unit to the South Pole and provide training for RPSC engineers who will be managing it.

Not only does the team want a diet they are accustomed to that includes fresh salads, they also need the visual and sensory stimulation offered by



*Above: Lettuces growing in the hydroponic greenhouse. Top: Model of the Food Growth Chamber proposed for South Pole Station.*

green plants, which are absent at the South Pole. The 20 by 30 foot chamber will give them the chance to see, feel and smell vegetable and herb plants year-round, but also provide them with a bright environment of en

*Continued to Page 57*

# Fish Adaption to Warmer Water

By Ian Henderson, University of Canterbury Chronicle.

Recent research in the University of Canterbury's School of Biological Sciences suggests some Antarctic fish can adapt to a gradual warming of their environment.

Doctoral student Cara Lowe and her supervisor Associate Professor Bill Davison, have been studying the impact of water temperature on a species of Antarctic fish, *Pagothenia borchgrevinki*.

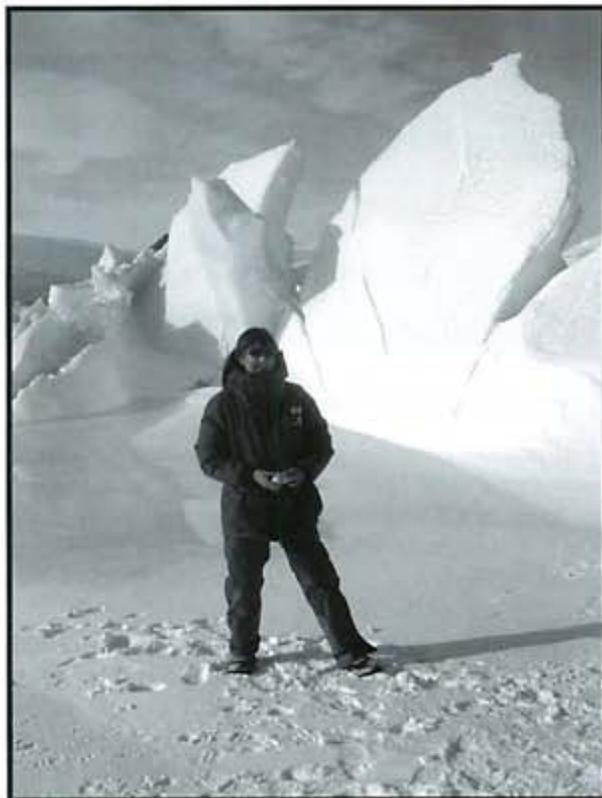
Antarctic fish are considered "extreme animals as they live at a constant temperature of almost minus two degrees Celsius", Dr Davison said. "Scientific dogma at the moment has these animals as what are called extreme stenotherms, which means that there's been a trade off." The fish could survive in very cold water, but were now specialised particularly for those conditions.

"Everybody in the scientific community is of the assumption that these animals will live quite happily

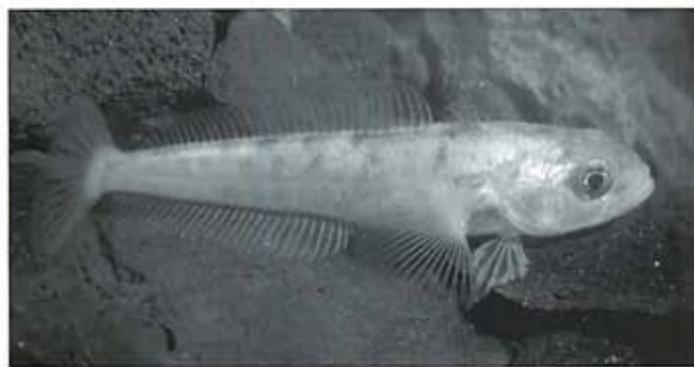
4 degrees C for four weeks, and were then assessed on their swimming performance. "We've got a swimming flume, essentially a fishy treadmill, so you can set the flow rates and assess their performance. We heat the water to different temperatures inside the swimming flume."

The experiments showed that fish acclimated to 4 degrees C "could swim better at higher temperatures, and fish that had just been acclimated to their normal environment couldn't".

Dr Davison said the experiments showed that "they'll swim quite happily in water up to eight degrees, maybe 10 degrees. They do some rather marvelous things." The next stage of



Cara Lowe in Antarctica. Photo by Bill Davison.



*Pagothenia borchgrevinki*.  
Photo: Bill Davison.

at minus two degrees C, and that they will die at plus five."

Dr Davison said he had always had "a sneaking suspicion" that this assumption "wasn't quite right".

The experiments, conducted at Scott Base, tested what happened to the fish when they were acclimated to warmer temperatures. "The scientific literature told us that you can't do it, and I didn't quite believe it, so we tried it, and we got results that no way did we expect."

Cara said the fish were kept at plus

the research will look at exactly how the fish are adapting to the change in temperature. Cara said it would be interesting to try acclimating fish to six degrees or more, to "see how far you can take them".

The impact of global warming on Antarctica was one reason for undertaking the research, Dr Davison said. "It's very prevalent on the Antarctic Peninsula - that part of Antarctica has had the greatest temperature change of anywhere on the planet." Global change was affecting Antarctica, so "if

you've got animals that are such extreme specialists that they live at minus two but they won't live anywhere else, what's going to happen even if you get a small shift in temperature?"

Cara said global warming over the next few hundred years would "not likely change water temperatures more than a few degrees". Air temperature would change more than seawater, and ice may melt, but sea temperature would change far slower. Dr Davison said the research they had completed last season showed "that the fish, at least, seem inherently capable of being able to adapt to elevated temperatures".

It was impossible to say what would happen in the long term, he said. "The fact that we can keep these fish for a month at four degrees tells me nothing about how they might survive in the long term." There had been little research conducted on other Antarctic animals in this field, Dr Davison said. "And the bottom line is, every animal is different."

# Frozen History-

## The legacy of Scott and Shackleton

Photographs by Josef & Katharina Hofflehner. Text by David Harrowfield.

Trade Edition ISBN 3-9501510-2-8. Limited Edition ISBN 3-9501519-1-X ([www.frozenhistory.com](http://www.frozenhistory.com))  
288 pages, 180 duo-tone photographs. NZ price \$150.

Available from David Harrowfield PO Box 36-269 Christchurch  
and Hedgehog House PO Box 33-152 Christchurch. [www.hedgehoghouse.com](http://www.hedgehoghouse.com)

### Reviewed by Colin Monteath

If you only contemplate buying two polar books this year then *Frozen History – The legacy of Scott and Shackleton* by Josef and Katharina Hofflehner and *Polar Castaways – The Ross Sea Party (1914-17) of Sir Ernest Shackleton* by Richard McElrea and David Harrowfield (NZ\$49.95) should be at the top of the list.

*Frozen History* is a lavish photographic essay of the Ross Island historic huts by Austrian photographers Katharina and Josef Hofflehner. New Zealand's Antarctic historian David Harrowfield provides a brief linking text to each of the chapters on the significance of the Hut Point, Cape Royds and Cape Evans huts.

After the Hofflehners completed a tourist voyage to the Ross Sea in 2001 - that resulted in a disappointing book, *Southern Ocean – photographs of a journey*, of limited scope though some refreshing panoramic perspectives – they returned to Ross Island courtesy of the Antarctica New Zealand to undertake a more thorough photographic documentation of the huts and their contents.

At first glance *Frozen History* may seem a rather expensive and frivolous undertaking. After all, what other book would allocate complete pages to photos of a bent nail, a coil of rusty wire or a wool sock. But the more you look at the soft 'glow' of the 180 duo-tone images (Duo-tone: two black and white plates used to provide fine grained detail and wonderful tonal range) the more you absorb the beauty of artifacts caught in the time-warp of the Antarctic atmosphere. The same images in colour simply would not have such a powerful impact.

This book will hold special meaning for anyone who has had the privilege of entering the huts. Such visits are commonly brief, cold encounters with the past that can be overwhelming in the sheer diversity of things to appreciate. In trying to take the wonder of the whole, the textures or even the existence of small items (a tooth brush rack or a hot water bottle on the wall) are often overlooked. It is *this incredible attention to detail* that the Hofflehners have skillfully tuned into with their large-format cameras. Interestingly, the images in the book have all been taken using natural light only (heavy tripod and long exposures in dark corners of the huts) with a digital back on the camera (no film). From now on, whenever I read one of the

Antarctic classics from the Scott and Shackleton era, I shall dive into *Frozen History* to recreate the essence of life in the early 1900s for pioneers living so far from home. These beautiful images allow me to almost smell the pipe tobacco adrift in the huts. I almost reach out to run my fingers over the acetylene gas plant, the Arrol-Johnston motor car fuel cans, the straw-wrapped bottles of pickles, the reindeer skin sleeping bags and a pair of skis. And I can almost hear the happy banter as sledges are prepared for a journey across the Barrier.

With the long-awaited release of *Polar Castaways*, the hitherto poorly documented history of Shackleton's Ross Sea Party that occupied the Cape Evans and Hut Point huts during the ill-fated 1914-17 expedition, *Frozen History* will be an immensely useful body of images to help flesh out what survival in the polar regions is all about.

### TRIBUTE

## A Tribute to Dave Massam

The Society recently heard of the death of Dave Massam who was involved in New Zealand Antarctic activities in the 1960's.

In the 1963-64 summer season he worked with a Peter Barrett geology party between the Liv and Shackleton Glaciers, then wintered as a field assistant and dog handler in 1964.

In 1964-65 he worked with Malcolm Laird around the Nimrod Glacier. Both these seasons were in areas that were very poorly known at the time. He returned to Antarctica as Field Leader in the Rennick Glacier area of North Victoria Land in 1967-68.

Dave managed several first ascents of peaks during these field seasons, including Mount Hunt (3240m). The Massam Glacier between the Shackleton and Barrett Glaciers is named after him. Dave worked for many years at Mount Cook as a ranger and later for the Department of Conservation. He is survived by his wife Mary and 3 children.

*Imprints in the Ice**Continued from Page 50*

before reaching a wide stretch of open water. A couple of hours later, I stand on the beach, a stone's throw from my destination. Strict measures are taken to preserve the historic sites. We leave our backpacks outside and brush the grit and ice from our boots. Then, a few at a time, it's a hushed, humbled group who step over the threshold into a segment of history. Here is the galley area with stacks of provisions: tinned cabbage, rhubarb, rabbit stew.

Here are the miserable bunk beds, narrow and firm. A reindeer sleeping bag and clothing that doesn't look particularly warm.

Ponting's darkroom, crammed with chemicals and equipment. Captain Scott's exclusive alcove. An Emperor penguin on a workbench. "Able Seaman Paton, while on his way to the hut, came across and captured a fine large Emperor penguin, but was rather taken aback when the Captain took charge of it for the 'Expedition'. He vows he will never catch another."

Windows piled with snowdrift outside cast light into the dimness. And the large table with chairs around it where so many plans had been made and events celebrated; where Grandad and his crewmates had been photographed 40 years ago.

Aware of my fortune to be one of the few people to journey here, I sign the Visitor's Book, "Bill's granddaughter". The stacks of seal blubber, ready for eating or burning, lie in the annex. Nosebags with pony fodder hang expectantly in the stable darkness.

Outside there are yet more provisions, cans rusting now but the wooden cases still relatively good, preserved in the dry Antarctic atmosphere. I picture the *Terra Nova* decked out in bunting on 18<sup>th</sup> January 1913 as it steamed into McMurdo Sound, ready to welcome Scott and a victorious polar party. Grandad summed up the moment: "it is needless to say how upset and downhearted we all are".

I return for another glimpse inside. I wait for a grandfatherly whisper in my ear but there is none. Instead, I share a privileged bond with my shipmates as we all feel

deepened respect for the bold explorers of last century, and their tough mental attitudes which gave them strength in such harsh conditions with basic equipment.

On the way back to our warm, comfortable ship, I tuck my face into my jacket away from the freezing snowdrift. Reflecting on what I've seen, the wonder of sharing this snippet of Grandad's life is almost overwhelming.

Our last days are spent at Shackleton's 1908 hut at Cape Royds, and Scott's 1902 Discovery Hut at McMurdo, where again we are reminded of today's luxury lifestyle. Beyond the stark Discovery Hut we're catapulted into reality: a jumble of buildings, roads, vehicles, cables, and noise that makes up the US base of McMurdo Station.

Sailing to Antarctica has illustrated the rigours of ocean travel, and allowed us space to be totally immersed in polar history and landscape. Suddenly, it's as if we've stepped out of a painting into the ugliness of the 21<sup>st</sup> century.

I find the contrast hard to deal with, yet the tour of Mactown's science labs and coffee house is interesting and appreciated. Close by, Observation Hill with its memorial to Scott and his men beckons. I wonder if I can slip away from the group to see the cross which Grandad helped make, but remember that I'd signed something to the effect that I wouldn't go off on my own. The last stop is our very own Scott Base, where history is more recent. It's also an opportunity to phone home in Christchurch - Dad can hardly believe where his daughter is - and indulge in some retail therapy. Stepping back through the frame into the painting, we return to our ship, homeward bound. The seas are wild, "boisterous weather.....glad when finished".

Now the midnight sun, the changing ice patterns on the water, whalespouts in a blue sea, dainty snow petrels, and a thousand other images bring colour to the pencilled notes of Grandad's log.

At home, I stow my lightweight thermal clothing back into his old sea chest in our bedroom. The penguin stamp on my forehead is long washed off, yet it's still there. And I have a stronger dose of *Antarcticitis*, for I have unfinished business on Observation Hill.

## SCIENCE

*FOOD GROWTH CHAMBER**Continued from Page 54*

hanced spectrum lighting, according to Giacomelli. The crop yields will be adjusted to the size of the current station population, which will include 200 people during the Antarctic's 3-month summer, and 30-40 people the remainder of the year.

The design of the sitting room in particular was based on the suggestions and experience of Phil Sadler, a former Antarctic construction worker and current designer of controlled environment facilities, together with Raytheon and other government engineers, scientists and technicians. By having a room with a big window where people can sit and look at growing plants while they play cards or socialize, Giacomelli says, they'll be able to experience the healthy effects of being around growing plants in a lighted environment that helps them flourish.

Aside from the intensive hydroponic crops in the food growth chamber, station personnel will also have the opportunity to assist in caring for other plants in the sitting area. The current project will be the first officially commissioned food growth chamber for the NSF, replacing a small test greenhouse that proved successful.

The ultimate goal of the food growth chamber is to provide a better quality of life for researchers who live and work at the South Pole, and to help others understand how people can adapt to living in seclusion without seeing the sun for months on end.

"For five and a half months there is no sunshine, just total darkness," Giacomelli says. "The benefit is not only for fresh food at that time, but also for the *high intensity* light that mimics the sun, the high humidity, the aromas and flavors, that remind us that we're alive and that we enjoy eating. Psychologically it's very important."

# Melting Holes to build *IceCube*

By Kristan Hutchison  
Courtesy of The Antarctic Sun.

Using hot water and ice, researchers plan to build the world's largest scientific instrument to detect some of the universe's smallest particles.

Called IceCube for its size, the project will turn a cubic kilometre of ice below Amundsen-Scott South Pole Station into a detector of high energy neutrinos.

The subatomic particles exist in large quantity, but are invisible, having no charge and almost no mass, and rarely reacting with anything as they speed through the universe. In the time it takes to read this sentence, 10 million neutrinos have rushed through your body.

This lack of interaction is both the appeal and the challenge of neutrinos. Because nothing stops them, neutrinos reach Earth from the edges of the universe unchanged, but they are also difficult to detect. An existing experiment at the South Pole proved neutrinos could be detected by lowering strings of light-sensitive optical modules into deep holes in the ice.

The globe-shaped glass optical modules freeze in place and watch for the faint blue flash occurring on the rare occasions a neutrino crashes into a proton, creating another kind of particle called a muon. IceCube is the next generation of the Antarctic Muon and Neutrino Detector Array (AMANDA), also led by the University of Wisconsin.

With 700 optical modules frozen in 19 holes over a 200-meter-diameter area, AMANDA records about four neutrinos a day. At that rate, researchers could wait decades for a major discovery. University of Wisconsin astrophysicist Francis Halzen wants results before he retires, so in 1998, a year after the first phase of AMANDA was completed, he submitted a letter to the National Science Foundation proposing to expand the detector. "In every way you look at it, it's a hundred times larger, ex-

cept in cost," said Halzen, lead investigator for IceCube. "In cost, it's more like 10 times larger." After five years of planning, completion of a 167-page Comprehensive Environmental Evaluation and arranging for broad international collaboration, the US\$272 million IceCube project was finally ap-



An AMANDA optical module being lowered into the ice. Photo by Robert G. Stokstad.

proved for construction by the National Science Board in May 2004. The lead institution is the University of Wisconsin. The NSF provides \$US 242 million, with the rest coming from other countries.

This month the drilling equipment begins the journey by truck, boat and plane to Antarctica,



Jiwoo Nam (CalTech) and Steve Churchwell (U. Canterbury) lowering a transmitter into a 150 m deep hole to measure the attenuation length of Antarctic ice for radio frequencies. Photo: Ilya Kravchenko (Fermi National Accelerator Laboratory).

where a square kilometre of ice will be riddled with as many holes as an infantry range target, but with much more precision. Already wooden stakes around AMANDA mark out the locations for 80 new holes, each numbered with black marker. The new holes will build out around AMANDA like growth rings on a tree, extending to within a half kilometre from the station.

The drilling itself is a feat of engineering, though it sounds simple enough – just squirt hot water into ice to melt out a hole. The tricky part is making sure that hole is deep enough, straight enough and melts fast enough.

"The design and construction of the drill is an accomplishment in itself," said IceCube project director Jim Yeck at the University of Wisconsin Space Science and Engineering Centre. "A significant investment in a new technology like this creates new opportunities. We already know of opportunities where people would like to use a drill like this for other scientific applications." The IceCube holes will and twice as hot. "Hot water drilling is a pretty barbaric process. You just add more heat all the time, no matter what the problem," said ICDS. The 47.6 metric ton hose reel arrived at the Pole in January 2004, filling three LC130 cargo planes.

"That's kind of the tip of the iceberg in terms of cargo," said Eivind

Jensen, Raytheon Polar Services project manager for IceCube support.

"The main body of cargo, almost the rest of it, is coming this year." Getting the 2.9 km of hose and the rest be 400 meters deeper than those drilled for AMANDA, and there will be four times as many. AMANDA's drill was the biggest in the world, but for IceCube it is too small.

The Ice Core Drilling Services at the University of Wisconsin designed one twice as big of the drilling equipment to the South Pole this year will take 55 of the 326 scheduled flights,



The hot water hose spool after assembly at the South Pole late in the season (Jan, 04). A 2.5 km long firehose will be coiled onto this reel to carry the hot water for drilling the IceCube holes from the pumps into the ice. Photograph from IceCube website.

Jensen said..When assembled, the drilling equipment takes up half a city block. "We have about the world's heaviest ice drill here and we're looking for particles that don't weigh anything," Koci said.

This first year they'll be satisfied to get the drill running by January and four holes made. Though the technology is tried and true, actually running a drill that large may take some practice and last minute equipment adjustments. "We're still going to be building the space ship on the way to Mars," Koci said.

Drilling will continue for six years, running 24 hours a day for about 59 days each summer, with the goal of producing from 12 to 16 holes a year. As many as 80 holes will be drilled by the end of the project.

"It really is cutting edge science," Koci said. "That's what's exciting about it." As the drill pulls out, a cable strung with glass globes will be lowered into each hole and frozen

permanently in place.

These are the eyeballs of the project, optical modules looking down for flashes of blue light. The blue flashes indicate a neutrino collision created a muon, propelled in nearly the same direction as the original neutrino. By projecting the path back into space, researchers hope to determine where individual neutrinos originate. Photomultipliers, the pupil of these mechanical eyes, are mounted inside 33 cm glass spheres commonly used to deploy instruments in the ocean. AMANDA used

700 similar, though simpler, modules. Small electronics boards were added to the IceCube modules, turning the ice into a network of light-sensitive computers. "Electronics love South Pole ice, because it doesn't move and it's cold." At the South Pole, the ice sheet is about 3 km deep, covered by a layer of dry snow pack. The snow compacts as it is buried beneath each year's snowfall.

At 100 meters below the surface the ice density is about 0.8 grams per cubic centimetre. Deeper and denser still, any bubbles are compressed, forming a clear and uniform ice below 1,400 m., the depth where IceCube begins. Only deep oceans and dark ice are sufficiently transparent, deep, dark and large for the modules to see the fleeting flashes of blue. Locations in the Mediterranean Sea may be used for future neutrino telescopes, but liquid lacks the stability of ice.

Remote as it is, the South Pole has

better infrastructure for supporting large science projects than any other suitable location, said Halzen. The network of optical modules will see about 400 neutrinos a day, predicts Halzen. As with AMANDA, the results will be sent back to his computer in Madison, Wisconsin daily.

The construction of neutrino telescopes is overwhelmingly motivated by their discovery potential in astronomy, astrophysics, cosmology and particle physics. IceCube can search for the sources of neutrinos, including Gamma Ray Bursts or Supernova explosions, Active Galactic Nuclei, the decay of super heavy particles, cosmic rays, exotic particles and WIMPS (Weakly Interacting Massive Particles). Much depends on chance.

The first discoveries could occur while IceCube is still being built, or may require collecting and closely examining years of data after the project's 15-year lifespan ends, as did the experiments that originally discovered neutrinos, Halzen said. "The quest for basic understanding of nature has yielded great dividends to our standard of living," Yeck said. "You're looking at something that can be rather esoteric to people, but the quest can be valuable in itself."

For more information on the NSF funded research featured in this story see: <http://IceCube.wisc.edu>.

## NEWS

### **First Flight of Season causes Damage**

Upon landing in Antarctica, the first flight of this year's summer season on 5 October caused mysterious holes in the main runway at McMurdo Station. The incoming aircraft ploughed ruts up to a metre deep in some places. Flights after that had to be postponed for four days, causing 300 people to be stuck in Christchurch. The ice that the planes land on is over five metres deep so there was no danger of collapse and no one was injured in the surprise landing. Flight operations are now back to normal.

Dear Editor,

In the book review article on *Polar Castaways* that begins on page 35 of Volume 22, No 2, 2004 there is a paragraph by Richard McElrea which states that Lionel Hooke streaked a football game on the ice on Midwinter's day June 22. I have a copy of the *Polar Castaways* book and have found the statement on page 121. What I would like to know is if there are any additional details of the incident in this book or Hooke's diary? Perhaps Richard McElrea, John Hooke, or David Harrowfield can shed some light on it for me.

The reason I am curious is that on 11 December 1976 a U.S. Navy Chief Petty Officer streaked the change of command ceremony of Antarctic Development Squadron Six at McMurdo Station wearing only a balaclava and a pair of Nike tennis shoes. I have recently acquired a full account of the American streaking, but I would like to have some additional details of the Lionel Hooker incident so I can add it to a story I am writing about the American incident. My story will appear in the Fall 2004 edition of the *Explorer's Gazette* that will be published at the end of this month.

Thank you in advance for any help that you might be able to render.

Sincerely,  
Viktor Offshodfor

Dear Editor,

First I must say I am sorry not to be in NZ as you are running some interesting items in your programme of lectures. However the real reason for this message is to make a few points regarding the last edition of ANTARCTIC:

First, on page 27 – Scott Polar Research Institute (SPRI) have been doing Oral Interviews for sometime now. Something to be encouraged. Glad to see in this article that the dates of TAE are quoted correctly whereas on page 24 they are not (1956-57) regarding the Air Force Museum exhibition. It may seem that I'm being petty on this point but references to history need to be correct. Secondly, on Page 33 - Polar Year Planning Underway - I'm trying to get celebration of TAE's 50th Anniversary included in the IGY/IPY activities here in the UK. Will keep you posted.

I particular enjoyed this last edition, so please pass on my thanks to all involved.

Regards,  
Peter Fuchs

Editors' note:

Thanks Peter for pointing out the incorrect dates in the Ice on My Palette article.

I have sent a letter to the Air Force Museum to point out this error and encourage them to use the correct dates.

Dear Editor,

I was about to submit the accompanying article of my 2001 trip to Antarctica (see "Over My Shoulder" section of this volume of *Antarctic*) when your latest magazine (Vol 22, No 2) turned up. Much to my surprise, 'Stamping Ground' featured a letter written to my grandfather on his return from the last *Terra Nova* voyage.

William McDonald probably never received this letter. Efforts to contact relatives of the author, James Mackintosh, have been unsuccessful, since records of the Scottish Society of New Zealand were destroyed by fire some years ago.

The letter probably lay in the Dead Letter Office for a while, but I wonder where else it's been in the last 90 years?

I'm also curious as to the whereabouts of the penguin in the glass case. Did it finally escape? A search by my father Alan turned up a number of its cousins in Christchurch but not the McDonald original.

Yours sincerely,  
Anne Hunter (nee McDonald)

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*Adelie penguin tracks, on the McMurdo Ice Shelf close to Bratina Island, December 2003, Luke Copland.*

