

ANTARCTIC



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Testing the Limits at Cape Hallett



COVER



Aerial view of LGP camp at Cape Hallett in the foreground, Seabee Hook in the middle and the Transantarctic Mountains in the background.

Photo by Rachel Brown. Antarctica New Zealand Pictorial Collection, K002:0506.

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*Penguin chicks in the foreground at the Cape Hallett LGP Camp.
Photo from the Antarctica New Zealand Pictorial Collection.*



Orion Ice Landing

The Royal New Zealand's Air Force's long-range Orion landed on the ice runway near Scott Base and McMurdo Station on 15 January 2006. It and its 13 member crew spent one night on the ice before returning to Christchurch. The flight was the first step towards a plan to have the RNZAF Orion based out of Scott Base each summer, to monitor fishing in the Ross Sea Region, as part of New Zealand's support for the Convention for the Conservation of Antarctic Marine Living Resources (CCAMLR). CCAMLR is monitoring and managing the toothfish fisheries in the Southern Ocean. Although the Orion has operated in extreme temperatures before, the idea of landing and departing from an ice runway had to be tested. Having an Orion on the ice in the summer also opens up the possibility to use the aircraft for search and rescue, science support and medical evacuation when necessary.



Top: The RNZAF's Orion secured on the ice runway in Antarctica.

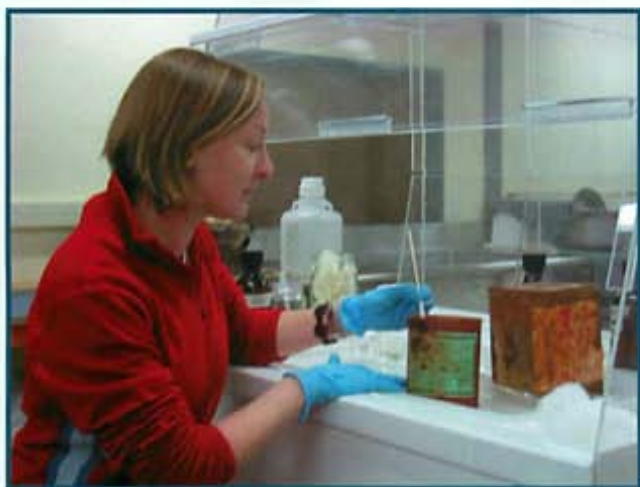
Middle: The RNZAF Orion on approach to the ice runway in Antarctica.

Bottom: View of the cockpit of the Orion after its landing on the ice runway in Antarctica.



The RNZAF crew of the Orion after their successful landing in Antarctica.

WORLD FIRST FOR HERITAGE CONSERVATION



Conservator, Nicola Dunn, works on one of the tins from Shackleton's hut at the purpose built conservation laboratory.

In a world-first for cultural heritage conservation, a team of three conservators will winter-over in Antarctica in 2006.

The team of professional conservators, who are specialists in the conservation of cultural materials, will spend the winter at New Zealand's Scott Base conserv-

ing artefacts from Ernest Shackleton's only Antarctic hut.

Lead conservator, Sarah Clayton, an Australian, has spent four summer seasons in Antarctica with the Antarctic Heritage Trust. This winter, she will be joined by Nicola Dunn of Britain and Ainslie Greiner of Australia.

The team will draw on the specialist equipment and specially built conservation laboratory, which was shipped to Antarctica for the duration of the project. The laboratory is one aspect of the project funded in part by a NZ\$300,000 grant from the New Zealand Lottery Grants Board's Environment and Heritage Committee. This expedition has also been made possible by funding from Hallensteins, who have an ongoing commitment to the project donating a percentage of sales from their 'Scott Base' brand of clothing.

During the 2006/07 summer season, conserved objects will be returned to Shackleton's hut.

Nigel Watson, Executive Director of Antarctic Heritage Trust sees this as a major step in the conservation programme. "The work to save these collections is complementary to the efforts to save the fabric of the explorers' buildings. We are delighted this comprehensive artefact programme is underway."

The team are scheduled to return to Christchurch during WINFLY 2006.

Australia attempts to build Antarctica's largest runway

Condensed from an article written by Annie Rushton.

Australian Antarctic Division (AAD) staff are to construct a blue ice runway topped with a snow pavement high on the inland plateau, 75 km from Casey Station in Antarctica.

During the 2005/06 season a team of five runway construction crew, constructed a trial snow pavement, separate from the proposed main runway at Wilkins. Although its size, a mere 200 m by 30 m, is but a fraction of the finished runway (4000 m by 100 m), it has exceeded all expectations in terms of success. One of two key objectives for the season was to validate the construction process for the main runway for intercontinental air transport from Australia to Antarctica.

Blue ice runways are commonly used in Antarctica. During the summer months, these surfaces can quickly become unusable. Even in temperatures which never rise above 0 degrees C, the deep blue ice absorbs heat from the sun and warms up, causing melting and pitted surfaces which can rapidly become unsafe for landing aircraft.

The protective snow pavement bonded to a blue ice glacier will deflect the sun's rays, remain colder and therefore be less prone to break up and melting.

The snow pavement has the additional benefit of creating a higher friction co-efficient which will allow aircraft to operate more safely in cross wind conditions.

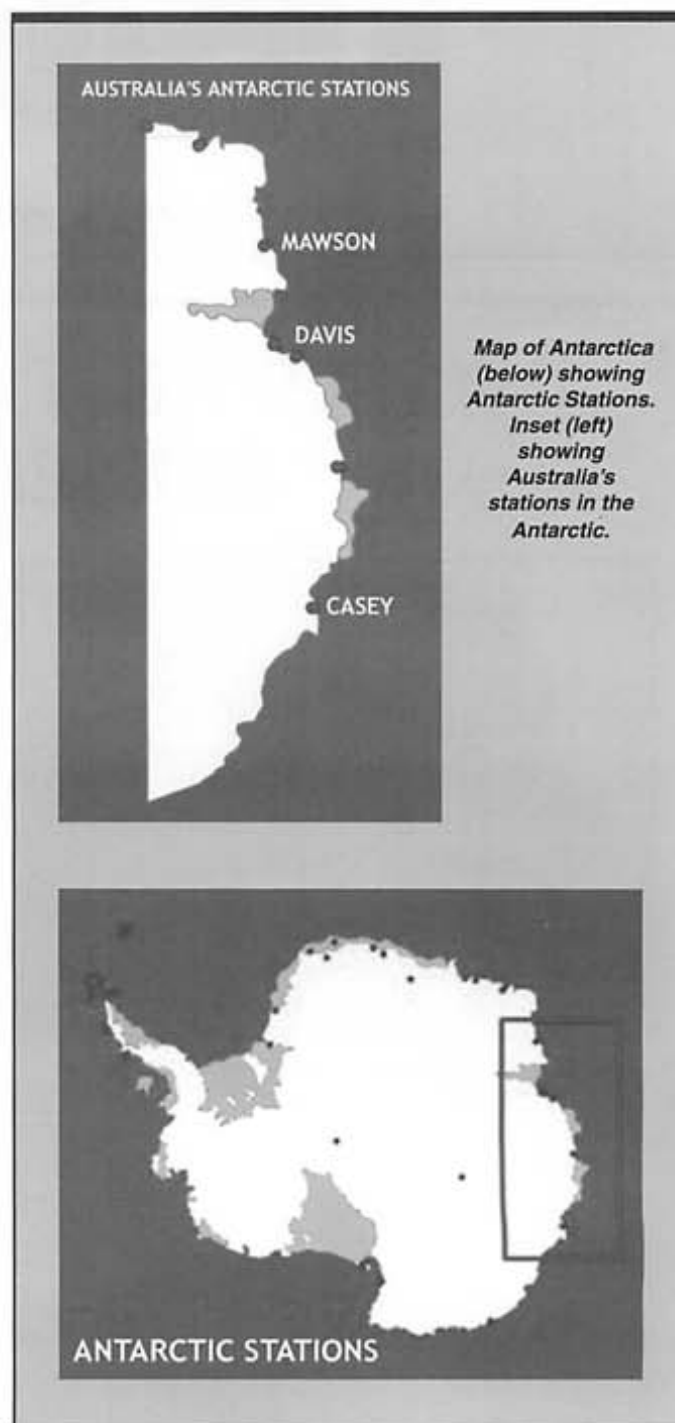
AAD staff learnt a great deal about the process of snow pavement rolling from US technical support, whose expertise was gained at the Pegasus runway at McMurdo. It is essential to compact every square centimetre of the runway surface to ensure bonding and a smooth level surface, each section of the trial area had to be passed over with special rollers several times with varying weights, speed and tyre pressures. Each rolling process comprised 20 passes with the machine, with a consolidation period of 24 hours between each complete roll. This is a time consuming and painstaking process at the best of times.

The new runway construction machinery which was recently shipped from Hobart has now arrived at Casey on the *Vasily Golovnin*, and will soon be in operation at the runway site. The range of new machinery, in particular the new rollers, will reduce the number of passes from 20 to just five, and so will greatly expedite the process.

Now that the variables of the conditions and situation are better understood, and with the outstanding success of the trial snow pavement process behind them, AAD staff will now work to validate the site location by the end of the season. They will use the newly arrived machinery to clear the snow off the main runway site and conduct a proof

roll. If all goes well, work will continue on the main runway next season, with a possible trial flight scheduled for early December 2006.

See www.aad.gov.au for more details.



LAKE VOSTOK HAS TWO BIG NEIGHBOURS

Trapped beneath Antarctica's 4 km-thick East Antarctic ice sheet are two bodies of water that rival the world's largest surface lakes and these subglacial lakes may harbour ecosystems that have been isolated for millions of years.

We know that more than 140 lakes lie buried beneath varying thicknesses of Antarctic ice, most of them are small. Other larger lakes exist, Lake Vostok, discovered decades ago, is the largest. It is estimated that Lake Vostok holds 5,400 km³ of water, enough to fill the US's Lake Michigan. Now researchers have used a collage of satellite data to recently discover two other large subglacial lakes located very near Lake Vostok.

One of the newly discovered lakes is dubbed 90°E because it stretches along that longitude. The other is called Sovetskaya, after the Russian research station which sits on top of it.

Although scientists knew of these two lakes, they had no notion of their sizes until they saw recent satellite images of the region.

90°E Lake has a surface area of about 2,000 km², about half the size of the US state of Rhode Island, which makes it the second-largest known subglacial lake in Antarctica. It probably holds about 1,800 km³ of water. Sovetskaya Lake covers about 1,600 km².

A new analysis of measurements of Earth's gravitational field suggests that the lakes in some places are about 900 m deep.

The lakes remain unfrozen because heat seeps up from Earth's interior and insulating layers of ice lie above them. Any ecosystems now in the lakes would have been isolated from Earth's surface for 35 million years, the estimated age of the ice sheet in that region.

Because of their great sizes, the covered lakes probably have always contained at least some liquid water and microbes. At Lake Vostok, drilling though the ice sheet has meant scientists are only about 90 metres away from penetrating into the lake cavity. Already ice extracted from immediately above the lake has revealed microbes trapped in the ice. It appears that the Russian drilling team are well placed to drill into the Lake Vostok cavity in summer season 2006/07 and proclaim they will do so without contaminating the isolated ecosystem.

A major international workshop, "Subglacial Antarctic Lake Environments (SALE) in the International Polar Year (IPY) 2007-08: Advanced Science and Technology Planning," co-hosted by Laboratoire de Glaciologie et Géophysique de l'Environnement (LGGE) and Texas A&M University, will be held in Grenoble, France, from 24-26 April 2006 to discuss future research and exploration of subglacial lakes in Antarctica.

See <http://salepo.tamu.edu/> for more information.

SUCCESSFUL TRAVERSE

The US South Pole traverse team arrived at the South Pole on 23 December 2005. The tractor train, carried 100 tonnes of cargo. Successfully completing the first overland driving traverse since the Trans-Antarctic Expedition in January 1958. It took the American team 43 days to travel 1600 kms, departing from McMurdo Station in the Ross Sea Region. The team spent 5 days at the South Pole station before heading back. The successful traverse means that an overland snow route between McMurdo station and South Pole station is feasible, with the object being to reduce the number of cargo flights between McMurdo and South Pole stations.

The arrival of the eight member team was the culmination of a carefully planned, four-year, field project. The team had safely avoided innumerable crevasses and plowed through soft snow to make the journey.

A few members of the traverse team visited the outskirts of the South Pole station the day before their official arrival to stage some of its 100,000 kgs of cargo. The team had encountered deep, soft snow along the polar plateau, requiring it to shuttle cargo as tractors continuously bogged down.

"We called it a swamp," said Greg Feleppa, a member of the field team, referring to the barren landscape leading to the Pole. He and Tom Lyman, a mountaineer who works in the McMurdo field safety training programme and is part of the expedition, led the traverse in a Pisten Bully, a tracked vehicle which was outfitted with a 6 m-long boom sporting ground-penetrating radar out in front, to snoop out crevasses.



*The eight member traverse team being greeted by those stationed at the US South Pole Base.
Photo by NSF.*

Thomas Orde Lees

MARCHED TO A DIFFERENT BEAT

Of the two members of Ernest Shackleton's failed 1914-16 Imperial Trans-Antarctic Expedition reposing at Wellington's Karori Cemetery (perhaps two and a bit if you include the image of Harry McNeish's cat, Mrs Chippy), Thomas Orde Lees is by far the most interesting writes John Thomson.

Thomas Orde Lees is a man whose primary reputation in polar circles seems to be that he made trouble for Shackleton and the expedition's second in command, Frank Wild, by insisting on certain actions to keep up a good supply of food for the desperate men, both during their time on the sea-ice and later on Elephant Island.

He has, in consequence, been portrayed in a depressingly negative way with recorders of the exciting event feeding off what may have been no more than casual observations in a diary written by a junior member of the party, himself under the natural stress of the extraordinary occasion.

Orde Lees was certainly destined to play a different hand than anyone else in Shackleton's party.

The marker on his grave in the servicemen's section at Karori simply declares that here rests Lieutenant-Colonel T.O.H. Lees, OBE, AFC, Royal Marines. The initials stand for Thomas Orde Hans which were his names at the time he joined the Royal Marines in England in 1895; and once recorded, those names naturally remained for official purposes. So when he sailed with Shackleton, he was simply Captain Lees.

T.O.H. Lees became Thomas Orde Lees for the remainder of his life by choice following the rescue of Shackleton's men of the Weddell Sea party from Elephant Island in 1916. He dropped the name 'Hans', perhaps because it sounded German and he had just learned that a much-esteemed elder brother, Edmund Hastings Harcourt Lees, had been killed fighting the Germans on the Western Front early in the First World War. Then he treated the names Orde and Lees each as a surname to make him-



Thomas Orde Hans Lees in his Royal Marines uniform shortly before the First World War. He first saw service in the Boxer Rebellion in China, where he also had his first experience of being trapped in ice.

Photo from Orde Lees Family Collection.

self Thomas Orde Lees.

His apparent feelings about Germans is interesting because he himself was born in Germany in most unusual circumstances in 1877. His father, a solicitor who became Chief Constable of Northants (and later chief constable of the Isle of Wight, where he was responsible for the security of Queen Victoria at Osborne House), had been married for five years when he took a mistress who became pregnant to him in 1876.

The parties involved were from wealthy and high-born families, the potential of a damaging scandal was considerable, and resolution of the

pregnancy problem required much planning and generosity of spirit.

Chief Constable Thomas Orde Hastings Lees finally took his pregnant mistress to the city of Aix-la-Chapelle – then part of France, today re-united with Germany as Aachen – for a secret delivery that was effected on 3 May 1877. The child was named Thomas, and in an event of pure Victorian drama, Thomas was taken by Grace Lees, wronged wife of the chief constable, and was brought up as her own, without any known reservation.

This of course made Thomas Orde Lees a candidate for the derogatory label reserved for those in his position, and it was as well that his shipmates on the *Endurance* when it left England in 1914 never knew of it: had they done so, many would have given him something more hurtful than the cognomina that they did attach to him when he became storeman for Shackleton's diminishing supply of food, the Belly Burglar being one of the least offensive.

Shackleton chose Orde Lees for the expedition in a kind of tit-for-tat trade between the services. When Shackleton went south with Robert Scott in 1900, he was the token Merchant Service presence in a Royal Navy show. In 1914, Shackleton returned the gesture in his private expedition by asking for a serving naval officer to accompany him, and Orde Lees, with a great interest in engines and things mechanical, was chosen.

He never had the occasion to display his motor skills because the *Endurance* was trapped in the Weddell Sea ice before any landing on the continent could be made, and after months of drifting finally was

crushed and sank. Before that disaster, Shackleton, with a finite amount of stores available, turned to Orde Lees as a disciplined and reliable person to take charge of the supplies, thereby deflecting the inevitable criticism from the lower deck from himself. Orde Lees, as expected, carried the burden and the abuse like a true soldier.

Everything about Orde Lees made him exceptional in the company of the *Endurance's* 28 staff and crew. He came from an Anglo-Irish family was sent off to boarding school at Marlborough at the age of seven, and at 14 he went into military academies to emerge as a Lieutenant in the Royal Marines in time for service in the Boxer Rebellion in China.

Two notable things happened in the east: the first was when his ship became trapped in ice off the coast of China in 1901, and Orde Lees was so thrilled, he later recorded, that he applied to join Scott's 1910-12 expedition. The other event was his introduction to Japan, a country he quickly grew to admire, not least for the discipline of its people.

Orde Lees believed that he went close to being selected by Scott, and it was natural then for him to apply for the Shackleton Trans-Antarctic Expedition a few years later. With some help from a powerful ally, Winston Churchill, his berth was confirmed and in August 1914, on the eve of war with Germany, the *Endurance* sailed south into obscurity while more important issues were decided, and ultimately glory.

Orde Lees thought that at least he would be spending time ashore on Antarctica, probably in the hut party that would create a base from which parties of scientists would strike out north and south while Shackleton and the selected few would make for the other side of the continent, via the South Pole. So on the *Endurance* he seated himself with what he knew were men of a much lower class in order to prepare himself for some close-living social shocks.

And so, he sat with Harry McNeish, the Scottish carpenter, among others for this immersion experiment. He was certainly shocked according to his lively and well-writ-

Risked Injury to Save British Pilots



ONE OF THE REMARKABLE FEATS of the late Lieut. Colonel Orde Lees, who died in Wellington on Monday, was his performance of jumping off the Tower Bridge to prove the parachute he was wearing would open within 500 feet. This photograph was taken as the colonel leapt from the bridge one day in 1917, 148 feet into the Thames below.

Newspaper clipping of his daring parachute jump from Tower Bridge, London, to demonstrate the safety of parachutes.

ten diary. McNeish was a frequent target for his habit of leaning back in his chair to spit out the porthole during meals, sucking his teeth loudly, picking his teeth after sharpening a match and scooping up peas with his knife. He thought McNeish to be 'a perfect pig in every way', but he conceded that he was not without fault himself and that he probably got on McNeish's nerves.

An idea of how McNeish could come across to others is contained in a comment by another ship-mate, not from the *Endurance*, who said he was 'neither sweet-tempered nor tolerant, and his Scots voice could rasp like frayed wire cable.' For his part, McNeish concluded that Orde Lees was simply mad.

Orde Lees had built around him a reputation for being a nag and a nuisance to both Shackleton and his second-in-command, Frank Wild. When Shackleton left Elephant Island (the miserable rock in the South Atlantic, part of the South Shetland Group) for South Georgia in the *James Caird*, he left Wild in charge of the 22 men remaining.

Hard words and thoughts soon developed between Wild and Orde Lees over the slaughter of penguins and seals and anything else that breathed and landed on the tiny island. Orde Lees, knowing how the animals migrated north each year, urged that nothing should be spared in what was fast becoming an open-air refrigerator, while Wild opted to have faith in a swift return by Shackleton with a rescue ship, and kill more or less on the basis of immediate need.

It was a bold gamble by Wild and he nearly lost his men. Orde Lees was quite correct in his assessment of events, and when Shackleton finally returned more than four months later the survivors were a ragged, depressed and very hungry group, not far from starvation and in talking range of cannibalism.

But all that was soon forgotten in the euphoria of a miraculous rescue of a forgotten expedition, though the cannibalism came back to haunt Orde Lees in his old age, when another survivor from Elephant Island (never confirmed, but probably Frank Hurley) wrote to him from Australia and confessed the plot which had none other than Orde Lees as the first course!

When the excitement had settled down and the grim realisation that the Great War was continuing in a world even madder than that which they had left two years earlier, many of the party went off to fight and Orde Lees reported back to the Royal Marines for an appointment.

But the service had no ready place for a 40-year-old officer (by then a Major) who announced that he really wanted to join the Royal Flying Corps. Shackleton was moved to assist him, but the RFC was not about to put him at the controls of a fighter aircraft, not at his age.

The best offering was a post as a balloon observation officer, for which Orde Lees would have to learn how to parachute, and if authority thought that this would discourage him, they were wrong. He enthusiastically accepted, loved the experience of manipulating a new technology, and by so doing launched an entirely new career.

In the history of parachuting, Thomas Orde Lees is considered something of a pioneer, not in the development stage for a chute, but by being the man most responsible for having the devices introduced into the Royal Air Force, which the two lofty decorations that follow his name, his Order of the British Empire and the Air Force Cross, acknowledge.

In 1917 parachutes were a well-tested reality: indeed, New Zealander, Captain Clive Collett, from Marlborough, made possibly the first official test for the then Royal Flying Corps early that year. The first man in Britain to jump with the aid of a parachute did so three years earlier. But the old die-hards of the Air Board, who ran the new service from their desks, would not have a bar of them: parachutes, they declared, were 'unmanly' and would only encourage pilots to avoid conflict with the enemy.

That enemy, it is worth noting, had no hesitation in using the new devices and thereby saved hundreds of young lives while records say that in 1917 alone there were 800 fatal accidents to trainee pilots in Britain, none of whom, of course was permitted to try to save his life via the parachute.

Pilots at the front in France knew what was happening and they wanted parachutes: all their appeals were failing. Orde Lees knew a good cause when he saw one, and with the help of the manufacturer of a parachute called the Guardian Angel, he demonstrated their safety in a dramatic way by jumping from Tower Bridge, London, into the River Thames, a height of barely 150 ft, then and for many years later the lowest voluntary parachute jump on record. A second man, an experienced pilot, repeated the demonstration.

Orde Lees did his jump in a blaze of publicity, having primed the Daily Mail of the occasion, and the Royal Marines authorities knew then that they had an officer seriously, in their view, out of control.

Once again Orde Lees' distant ally, Winston Churchill, who also recognised a good cause, persuaded the Air Board to form a Parachute Com-

mittee in June 1918, soon after the Royal Flying Corps and the Royal Naval Air Service had combined to form the Royal Air Force. He organised Orde Lees to be the secretary and driving force.



*In the harbour after his jump from above the Statue of Liberty, New York.
Photo by Alex Turnbull Library,
Wellington, NZ.*

The cause was good and Orde Lees developed it with enthusiasm. The Air Board wanted research, so he had tests made at several points and at one stage had his own aircraft and pilot to ferry him between depots.

Sensing the inevitable, Orde Lees organised a supply of Guardian Angel parachutes to be stored in France and the pilots were made aware of this. They wanted parachutes desperately: as well as witnessing the enemy escaping from damaged aircraft and surviving, many had had the experience of seeing comrades trapped in burning aircraft and dying horribly.

Some pilots carried loaded revolvers in combat and were prepared to shoot themselves rather than burn: others simply jumped from doomed aircraft.

Senior RAF officers met in France and, as reported by Orde Lees, told the Parachute Committee, 'We want our single-seater fighters fitted with parachutes as soon as possible'. This was the climax to Orde Lees' work. The committee came down firmly on the side of the pilots and recommended to

the Air Board that, as a result of all of tests and demonstrations, use of the life-saving devices could not be denied.

The diehards of the Air Board were in no hurry, and November 1918, and the end of hostilities, came without their endorsement. In fact they prompted disbanded the Parachute Committee and amazingly it was not until 1925 that parachutes were finally provided to the RAF. For Orde Lees, there was nothing more to do but return to the Royal Marines.

Although he was honoured for his brilliant work, becoming the first non-pilot to win the Air Force Cross, and being singled out by name in 'The Times of London' for his distinguished position in the struggle to protect pilots, the War Office remembered his so-public campaign and his jump from Tower Bridge before the press, and decided to dispense with his services. Orde Lees later said he was told to resign or face a court-martial. He went quietly and retired.

The developer of the Guardian Angel soon employed him to demonstrate the parachute widely, in Britain and throughout Europe, and in the United States. His expertise then attracted him to join a quasi-military mission to Japan, where a naval air service was being developed. This was a controversial operation, much criticised in the United States where it was considered Japan would one day seek to expand, and for Britain to assist a potential enemy was considered outrageous.

But Britain and Japan were wartime allies, and there was no logical reason to turn down a sound commercial opportunity. The compromise had members of the British Aviation Mission working not as servicemen in their uniforms, but as individuals privately recruited by the leader, Captain, the Honourable W.F. Forbes-Sempill, and serving in the Imperial Japanese Navy. Orde Lees, as parachute expert and assistant ground instructor, became a Lieutenant-Commander.

The mission operated from 1921 until 1923, when the true worth of its work to the Japanese was finally appreciated by the British authorities

and it was quietly wound up. Orde Lees had such regard for Japan and its people that he did not want to leave. His personal life had survived one bad marriage (he was a widower with one daughter living with a guardian in Britain) and he had no desire to return there. So for several years he worked in Japan as correspondent for 'The Times of London', spent a year with the British Embassy, and then made a good living teaching English at a private college as the decade of the 30s arrived.

In 1932 Orde Lees married a Japanese student, Hisako, whom he called Ellaline. She was considerably younger, but they were a happy couple. They had a world-wide honeymoon, including a trip to New Zealand, and Ellaline in 1936 had a baby girl, Daphne Orde Louise Lees.

Their comfortable life was destroyed in 1941, when the Americans' greatest fear occurred and Japanese expansion (evidenced much earlier in Manchuria and China) exploded across the Pacific. Orde Lees, who had been advised to get out and with his small family, left Japan by sea a few days before the Pearl Harbour attack, abandoning two homes and a sound bank account but avoiding internment.

They arrived in New Zealand where the presence of a Japanese national, Ellaline, created a fuss. She had several examinations, and when she refused to translate documents in Japanese, one official decided she was an enemy to be confined. However the Wellington Aliens Authority in February 1942 praised 'the courage of her convictions' in refusing to work over Japanese documents, and the final decision was to allow them to settle.

But Orde Lees' first wish, to live in Tauranga, was refused by military authorities because the long and lonely coast was a potential landing point for an enemy attack: instead they were settled in a small flat on The Terrace, where they could be 'discreetly observed'. In time, Orde Lees – facing relative poverty for the first time in a privileged life – scrimped and saved the deposit on a small house in Island Bay.

Finding work was essential, and the well-educated Orde Lees was forced to take what he could find: his prime work was as a messenger and delivery boy, on a bicycle, for the Correspondence School. But rather than feeling demeaned by this lowly position, Orde Lees performed his duties with rare style and became something of an identity in the city, whizzing about on his bicycle in sandshoes because they were both comfortable and cheap.

His love of speed and excitement never left him, and he soon worked out the fastest way from Island Bay into Wellington: hanging on the

ENVIRONMENTAL ADVISER HAS 'DREAM START'

Antarctica New Zealand is living proof of the success of the Graduate Certificate in Antarctic Studies (GCAS). They've recently appointed GCAS graduate Jana Newman as their Environmental Advisor. Jana had previously been working for the Department of Conservation on Stewart Island – so not only has she got a great conservation and environmental background, she's also used to working in cold conditions!

While most of us struggle with a myriad of new names, new faces and new IT systems when we start a new job, Jana's induction to Antarctica New Zealand was a relative breeze...two days into her new job and she was winging her way south.

"It's a dream start in anyone's eyes," said Jana. "I had been to Antarctica before as a student of the GCAS programme, but having the opportunity to return as a professional gave me a whole new view of the Antarctic."

Jana's time spent on the Ice in the 2005/06 season involved mapping the vegetation in a specially protected area at Cape Bird.

"We referred to it as the Cape Bird Moss Hunt" said Jana. "There has been some confusion around the exact location of the boundaries of the protected area and the vegetation there. It's really important to clearly map the moss and the boundaries to ensure that operations in the area do not interfere with the specially protected area and the moss."

As well as hunting for moss, Jana worked around the Scott Base area, creating with Gateway Antarctica's GIS Technician, Paul Barr, a detailed digital map, which will be used to create an environmental monitoring GIS (geographic information system). This will be used for monitoring impacts around the base such as fuel spills and also to relocate sites for things like photo monitoring and litter surveys.

Jana is a graduate of the University of Canterbury. As an undergraduate geography student, she found out about GCAS. Inspired by its academic content, Jana put her Masters in Glaciology on hold and signed up for GCAS in the summer of 2001/02. Her individual project involved mapping the environmental footprint of Scott Base – an almost ironic subject choice, given her current position. After GCAS, Jana resumed her Masters, with a focus, of course, on Antarctica – 'The impact of human activity on glacier change on Hut Point Peninsula.'



Jana Newman in Antarctica near Cape Bird

Continued to Page 80

Testing the Limits at Cape Hallett

PART ONE By Dr. Don Jeanroy

Don writes this piece, which relates to his experiences during Operation Deepfreeze II and the challenges faced by the *U.S.S. Arneb* which he served aboard during 1957. Don is currently an educational consultant working for the University of Idaho, in Boise, Idaho, USA.

PREPARE TO ABANDON SHIP

One of the most difficult and dramatic decisions a ship's captain must make is to prepare his officers and crew to abandon ship when the ship is in a perilous situation.

Off the coast of Cape Hallett on the morning of 1 January 1957, with the *U.S.S. Arneb* being hammered by gale-force winds, with the ship's hull slowly buckling inwards from the pressure of the surrounding sea ice and with a 700 foot iceberg bearing down on the ship, Captain Nels Johnson issued the 'ultimate command' for the ship's crew to make ready to abandon ship — if the situation got worse.

The *Arneb*, accompanied by the U.S. Coast Guard icebreaker, *Northwind*, were part of Operation Deepfreeze II. The *Arneb's* crew and the attached U.S. Navy Construction Battalion (Seabees) were responsible for locating a suitable base/camp site at Cape Hallett and build the housing, scientific and storage facilities for a joint American-New Zealand scientific station at that location.

THE FORESHADOWING OF TROUBLE

The history of the Antarctic is filled with a variety of stories in which the weather played a significant part in the success or failure of a given expedition. During those seasons when the temperatures were moderate and ice conditions were less severe, most deployment operations were guaranteed a reasonable degree of success.

On the other hand, when harsh and unpredictable weather conditions prevailed, most operations were held to a minimum level of success. This often involved a certain degree of human and/or material sacrifice on the part of the expedition. The *Arneb* faced this type of situation when it participated in Operation Deepfreeze II in 1956-7. Hazardous weather conditions repeatedly threatened the expedition and a series of small, yet significant, events impeded its overall success.

Shortly after leaving Wellington on 10 December 1956, the *Arneb* encountered difficult weather conditions, including heavy seas, severe fog, cold temperatures and driving snowstorms. Icebergs and large sea ice formations appeared by the fifth day out of port and soon the *Arneb* was pushing her way through thick ice fields while attempting to

follow behind the icebreaker *Northwind*.

Within days the severe ice conditions appeared to have ruptured a seam near the starboard bow and water flooded into a paint and emergency storage area. The captain called for a repair party to investigate and they discovered a 29 foot cracked seam. Within minutes, emergency pumps were deployed. After two hours of pumping, it was apparent that the ruptured seam could not be welded from the inside of the ship. The repairs had to be made from the exterior of the hull at the waterline.

This required the *Arneb* to be positioned with a port list of 12-degrees to enable the welding crew to be lowered over the starboard side to make the repairs. To accomplish this, all heavy equipment on the main deck was moved to the port side and four heavy landing craft were swung out over the same side. Tons of fuel oil and drinking water were also pumped to available portside tanks.

During the following days, after the initial damage was repaired, the *Arneb* continued to experience very difficult sea and weather conditions as it fought its way to Cape Hallett.

A SHIP UNDER SEIGE

On 30 December 1956 the *Arneb* finally arrived at its Cape Hallett destination. Work immediately began to locate a suitable landing and camp site and plans were implemented to transfer the construction and building materials to the 'beach.'

But on the following afternoon all work was interrupted when a heavy gale began blowing out of the south. By that evening, a serious blizzard developed and the mountains and shoreline surrounding Cape Hallett had virtually disappeared from view. The ship's crew was placed on a 'severe storm' watch and the ship was repositioned so the bow would be facing to the south and into the storm. The shoreline pack ice was now on the ship's starboard side. By 20:00 that night, the winds were blowing at over 60 knots.

To be continued in the next edition of Antarctic, Vol 24, No1, 2006.



Left: ANDRILL Test. Middle: ANDRILL Camp.
All Photos from Antarctica NZ Pictorial
Collection K001:0506.

Challenges for ANDRILL

Extensive sea ice and damage to the Russian icebreaker *Krasin* threatened to unravel ANDRILL engineers' plans to reassemble the drill rig and test their new hot water drill this Antarctic summer season.

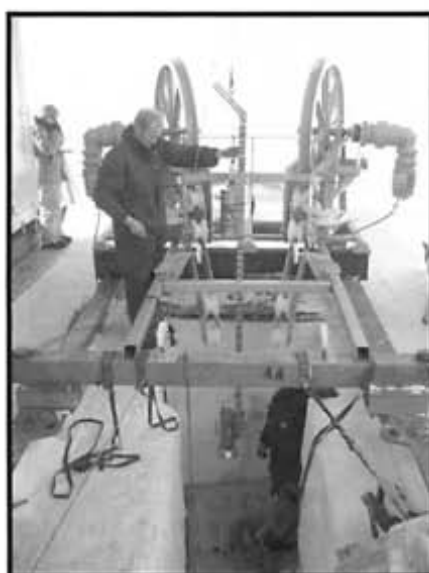
The delay in off-loading the new drill system equipment at McMurdo's ice pier meant that ANDRILL staff – including scientists, drillers and engineers – found themselves looking through an ever-decreasing window of opportunity, as the continued delays and the looming end-of-season threatened any chance of setting up a hot water drill test.

"Led by Alex Pyne from Victoria University, who is largely responsible for the design of the hot water drill, everyone banded together during and after the ship offload and we managed to condense a planned fortnights worth of work into just four days" said ANDRILL Project Manager, Jim Cowie.

The hot water drill trial went well and a bonus was that science, lead by Dr Tim Naish, managed to get some very good results by utilising the 100 m deep, 600 mm diameter hole to access the ocean and sea floor underneath.

"The short cores of sediment, less than 1 metre long, will provide a history of the deglaciation of the McMurdo Sound region under the Ross Ice Sheet since the last ice age – 20,000 years ago, and set the scene for deeper exploration in time by the ANDRILL project" said Dr Naish.

Antarctica New Zealand is managing the multi-national project,



ANDRILL Hot Water Drill.

which will officially kick off at WINFLY in August 2006, with a small team heading south to transport the estimated 30 sledge-loads of equipment to the McMurdo Ice Shelf (MIS) drill site. Drillers and support crew will follow them on the first flights at main body and it's anticipated that the first sediment core will be produced in the latter part of October 2006.

"By that stage, there will be 45 scientists and technicians ensconced in the Crary Lab at McMurdo Station to begin analysing the core once it is retrieved from the MIS hole. Up to 25 ANDRILL personnel will call Scott Base home for the best part of three months, working around the clock. Once we start drilling, we simply cannot afford to stop" said Mr Cowie.

As a result of the hot water drill test, scientists managed to extract

some high resolution seismic data, which upon analysis, supported the earlier findings of a thick upper interval of soft sediment under the MIS drill site.

"Core recovery in soft sediments is difficult, but achievable with the right coring tools. It is within this interval that we expect to recover the more recent clues to ice sheet fluctuations and therefore climate change in Antarctica" said Mr Cowie. "The estimated 300 m of soft sediment is where scientists believe a detailed climate story for the last 1 million years is held."

During next season's drilling programme, the hot water drill will play a vital part in opening and maintaining a hole in the 100 m-thick McMurdo Ice Shelf, through which the four-stage drill 'string' will be lowered, through 800 m of water, to be embedded in the sea floor. The main objective is then to recover 1,000 m of rock core. "If that ice shelf hole was to freeze up on us we could lose close to NZ\$2m worth of drilling equipment" Cowie said. Once the core is retrieved, it will then be split into two – a sampling core and an archival core – and scientists' initial reports will be delivered within six months.

"In very general terms, the cores will reveal the ebb and flow of the Ross Ice Shelf and Antarctic ice sheets in response to past natural climate cycles. It is essential to understand the natural rhythm of past climate change in order to assess the impact of human-induced warming in Antarctica

Continued to Page 80

John Cross

8 January 1915 - 29 November 2005

By John Mather

It was with a deep sadness that we learnt of the death of John Cross in November 2005. John was an enthusiastic and tireless supporter of the New Zealand Antarctic Society.

It is hard to separate John from his wife, Ethel, as they were such a good team, often seeming to be one and the same person.

For a great number of years, Ethel was the Secretary and John the Treasurer of the NZAS Canterbury Branch. This was a time of progress for the branch and they were able to organise regular meetings and enlist many memorable speakers.

Ethel and John together with Rata McLean were responsible for some memorable cocktail parties to welcome the return of Operation Deep Freeze and these parties became an annual event. There were also successful gatherings for visiting dignitaries. During this tenure the Mid-winter's Dinner became an annual event. In all these events Ethel and Pat, their daughter, were the "front office" while John worked tirelessly behind the scenes to ensure that the events were a success.

Due to their team work, the Canterbury Branch was vibrant and during the year there were many an interesting event. John and Ethel represented the NZAS at numerous events and were excellent ambassadors.

John, Ethel and Pat were extremely hospitable and they had an "open house policy" which many an Antarctic visitor availed themselves of. For a large number of the VXE6 crew, their home was a "home away from home" and the Crosses became surrogate parents. As they had both themselves been in the Air Force during the war, they had an affinity to fliers. New Zealanders were always



welcome as well. They were able to relax and enjoy a home cooked meal and a friendly, helpful and cheerful atmosphere.

In the 1960s, most of the committee meetings were held in John and Ethel's sitting room and I can well remember John, before he stopped smoking, sitting in his armchair contentedly puffing away on his pipe.

They, together with a team of volunteers, organised packages to be sent to Scott Base which were greatly appreciated by the recipients. In those days, the base was rather spartan and any comforts were welcomed.

For a number of years, John was the NZAS National Secretary, a position he filled admirably. John was well organised and could be relied upon at all times to get things done.

Together with Ethel he was a mine of information on the NZAS and sadly, with their passing, the society has lost some of this historical information.

John may have been small in stature but he made up for it in many different ways. He was a gentleman who would offer excellent advice if asked. He could think things through

in a logical manner but was not the sort of person who went around telling people what they should be doing. There were many elderly on Clissold Street, who were very thankful of the care he provided them. He was intensely proud of "his girls" – Ethel and Pat – taking great care of them and spoiling them. Unfortunately, in his final years he became almost stone deaf as a result of war service. Even with his two hearing aids he found it difficult to follow conversations and this caused him to withdraw from many social activities.

The NZAS has lost a staunch and faithful member who could always be relied upon to give his best. When Ethel died John lost part of his soul and he pined for her. They are now once again reunited. John and Ethel have left this world a better place and a large number of people have benefited from having known them. Thank you John, and Ethel, for being such good friends and for being there when the going was difficult.

John Cross was National President of the Antarctic Society from 1972-74, and Vice-President from 1975-76. John and his wife Ethel (see "Tribute" Vol 22, no.2, p.34) are remembered for their friendliness toward overseas Antarcticans passing through Christchurch, especially from America. John was a staunch supporter of the NZAS Canterbury Branch until poor health prevented him from attending meetings.

Arctic Challenge

Australian law professor Rosemary Rayfuse, aspires to be the first Australian woman to attempt to ski from the North Pole to Ward Hunt Island, the northern most point in Canada. Rosemary will traverse over some of the most inhospitable, dangerous and ever-changing terrain on earth to achieve that goal.

The expedition intends to highlight how global climate change, increasing human impact and technological developments are leading to significant changes in polar environments. These changes present challenges for the future of polar governance and have serious implications for countries, like Australia, New Zealand, the US and Canada, who have sovereign interests in the polar regions.

Rosemary is an Associate Professor in the Faculty of Law at the University of New South Wales, Aus-

tralia, where she specialises in International Law.

The expedition will begin in April 2006 at Longyearbyen, Spitzbergen, from where team members will fly to the floating Russian Ice Station, Borneo, which is established in April each year on the Russian side of the North Pole at 89° N latitude. From there, hauling loads of up to 85 kgs each, Rosemary and six team members will ski approximately 108 kms to the North Pole and continue over the top of the world for a further 770 kms on to Canada. The team will have one air resupply and plan to arrive at Ward Hunt Island, Canada, on 23 May 2006. After reaching Ward Hunt Island the team will be flown out to Resolute Bay by chartered aircraft and from there, will return to Sydney, Australia by commercial airlines.



ANTARCTIC ENZYME ENTERS BILLION DOLLAR MARKET

An enzyme derived from an Antarctic micro-organism found in the volcanic vent of Mount Erebus is being launched onto the billion dollar global DNA extraction market by ZyGEM Corporation. Professors Roy Daniel and Hugh Morgan, from New Zealand's Waikato University, were working nearly 4000 m up Mount Erebus, just 100 m from the summit, during a six week expedition in 1981, when they discovered the bacteria from which the enzyme was extracted.

They were taking soil samples from the partly algae-covered soil, laid bare of snow and ice by heat from underground vents. The soil contained the micro-organisms. The air temperatures were ranging from -15°C to -35°C, with a wind chill factor as low as -70°C. Below the surface, where the bacteria were living, temperatures were +20°C, to sometimes as high as +70°C.

Upon their return to New Zealand, the team cultured and preserved the organisms isolated from the sub-soil samples of Mount Erebus. It was not until 1990 that they proposed the use of the enzyme contained in one of the bacteria for possible use in DNA extraction. The new enzyme is proving popular in the DNA extraction technique because it can work with smaller samples, works three times faster and costs less than other existing extraction methods.

A new company, ZyGEM, was established by the discovering scientists, their universities at Waikato and Auckland, and Endeavour Capital to capitalise on the invention.

Famed polar explorer Norman Vaughan dies

Famed Antarctic explorer Norman Vaughan died 23 December 2005 just a few days after turning 100 years old.

As a young man, Vaughan explored Antarctica with Adm. Richard Byrd, joining him on his 1928-1930 expedition to Antarctica as a dog handler and driver.

Vaughan continued to seek adventure his entire life. His exploits included finishing the annual Alaskan sled dog race, the Iditarod, 13 times, the last six after age 70. At age 96, 70 years after he competed in the Olympics as a sled dog racer, he carried the Olympic torch in Juneau, Alaska, USA, passing the flame from a wheelchair. Vaughan never abandoned his fascination with the Antarctic continent. At 89, he returned to Antarctica and climbed the 3,145 metre peak Byrd had named in his honour. The Alaskan had planned to again climb Mount Vaughan to celebrate his 100th

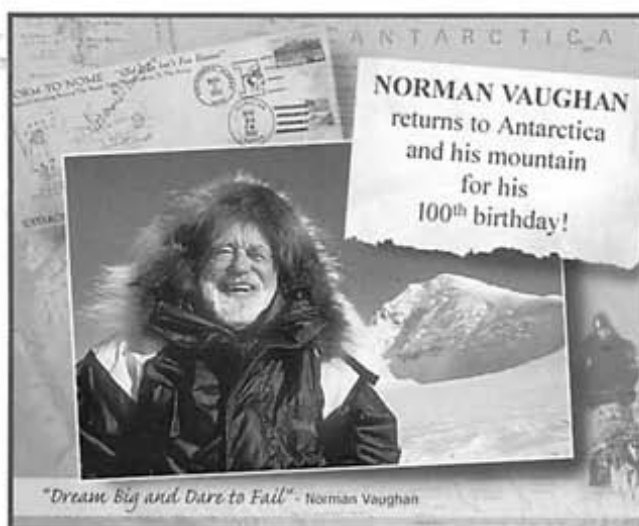
birthday. Vaughan was born 19 December 1905, in Salem, Massachu-

crew that drove dog teams 2,400 kms across the frozen continent to collect scientific samples.

During World War II, Vaughan served as an Army dogsled driver, attaining the rank of colonel and engaging in numerous rescue operations in Greenland. He devised a plan for one such operation to parachute sled dogs to the Battle of the Bulge in an attempt to save soldiers stranded in the snow. While the plan was backed by Gen. George Patton, it was later cancelled due to logistical delays.

On the celebration of his 100th birthday, he reportedly had a sip of champagne, his first taste of alcohol after promising his mother he wouldn't drink until he turned 100.

To learn more about the famous explorer and his life, visit his web site at www.normanvaughan.com.



setts, USA. He was the son of a wealthy leather tanner and shoe manufacturer. In 1925, he entered Harvard University but soon left to be a dog musher in Newfoundland for a medical missionary. He left Harvard for good to join Byrd on his expedition. Vaughan was part of a

NEWS

IUU FISHING DEMANDS IMMEDIATE ACTION

The global problem of illegal, unreported and unregulated (IUU) fishing demands immediate action, NZ Fisheries Minister Jim Anderton told an international meeting in Paris.

Addressing the final meeting of the international ministerially-led Task Force on IUU fishing in the High Seas, Mr Anderton endorsed the just-released report of the task force but highlighted the "enormity of the challenges" to come.

"At the moment it is still a lose/lose situation. In the absence of global political resolve and the necessary leadership to sustain it, IUU fishing

continues to threaten the sustainability of fish stocks and marine environments," Anderton told the forum.

"Exposing the illegal fishing activity; deterring those who undertake such damaging practices, and importantly, enforcing whatever framework results to ensure compliance – these are the challenges."

Anderton applauded recommendations to expand and enhance the International Monitoring, Control and Surveillance Network and establish a vessel information system. He warned however that while the

report had resulted from a coalition of ministers from "like-minded countries", a major challenge would be enlisting the support of those countries not as aware of the issue and not as inclined to address it.

IUU fishing has been a particular problem in the context of the Southern Ocean toothfish fisheries. IUU fishing not only effects populations of the harvested fish, but adversely effects by-catch species including birds such as albatross and petrels.

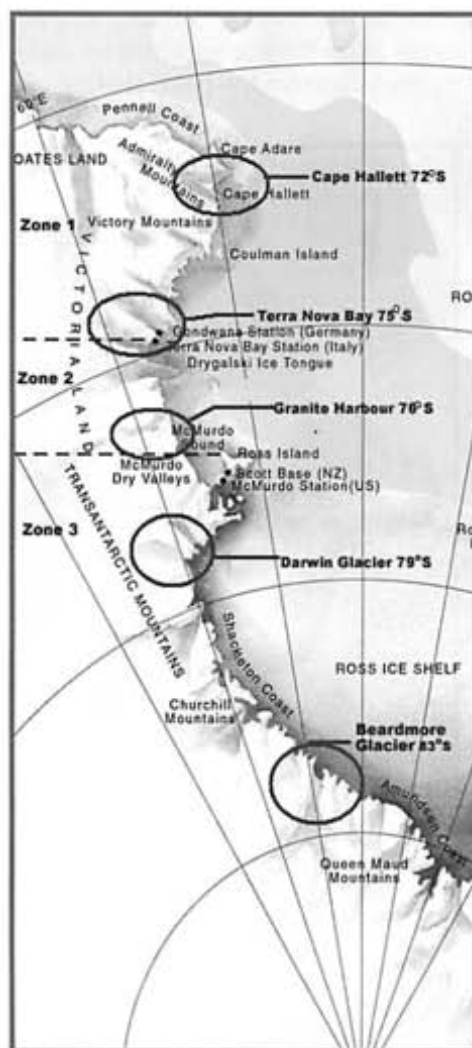
First Stage of LGP Completed

The largest deep field camp in Antarctica New Zealand's history was packed up for the final time and flown back to Scott Base – heralding the end of the first stage of the multinational Latitudinal Gradient Project (LGP).

The Cape Hallett camp was the first of five camps to be set up to support the LGP – a 15-year scientific journey of discovery around the vast coast of Victoria Land. Its overarching, general hypothesis is that ice-driven dynamics control the structure and function of ecosystems (marine, terrestrial and freshwater) near the limits of life at high latitudes. The latitudinal gradient in this instance, is being used to study the effects of potential changes in regional climate that may be associated with global change, as well as describing a range of environmental conditions for more fundamental studies.

"As an ecosystem study, the LGP's point of difference is that it measures both terrestrial and marine ecosystems" said Antarctica New Zealand's LGP project manager, Shulamit Gordon. "The whole premise of the LGP was to bring different science disciplines together to enable people to work collaboratively in pursuit of more holistic and comprehensive science outputs."

Already, the success of LGP is tangible. Science collaboration at Cape Hallett has resulted in the development of synergies between the different disciplines, with several of the events now sharing sampling techniques and data. In addition, events are planning to continue working together during stage two of LGP in Terra Nova Bay (for marine



This map shows the location of the five research sites of the Latitudinal Gradient Project.

events) and in the Darwin Glacier region (for terrestrial events).

"The theory has been that in order to come up with the answer to the key questions, we couldn't just study one component of an ecosystem. We needed to look at it in terms of how things link together, how they interact with, and depend upon each other. This approach will not only increase our understanding of polar ecosystems, it will enable us to create a predictive knowledge of the future effects of environmental change on these ecosystems" said Ms Gordon.

Antarctica New Zealand is the LGP project leader and has provided support to more than 58 scientists, completing an estimated 1071 'people days' over the past three years. The project has tied in well with the Cape Hallett remediation, which has seen the site cleaned up as part of a directive of the Environmental Protocol.

Rachel Brown, camp manager, and Gus McAllister, managed to dismantle and dispose of the remains of the old Hallett Station in between looking after the science personnel, fixing whatever was broken, cooking Christmas dinner and keeping a watchful eye on the tiny splatters of moss and lichen struggling for life in the weak sun.

"Rachel and Gus were absolutely integral to the camp's success. Both were involved with the LGP camp for its entire three years and that continuity enabled delivery of a very high level of support to the visiting scientists" said Gordon.

New Iceberg Troubles

While trouble from the B15 Iceberg may be a thing of the past, B15's sibling, C16, is now causing trouble in the Ross Sea Region.

Several immense Antarctic icebergs calved from the Ross Ice Shelf in the Ross Sea sector during 2000. The first calving event, in March 2000, produced iceberg B15, the largest iceberg ever observed. When it calved, it was approximately 295 km long by 37 km wide, with an area of about 10,600 km². B15 moved north, broke into parts and has now melted (see *Antarctic*, Vol 23, No 3, 2005). Further calving events on Ross Ice Shelf have led to the creation of C16. Now, C16 is threatening to cause disruption to both Scott Base and McMurdo Station. C16, while not as giant as B15, is no minor iceberg, measuring in at 15 km by 43 km.

The icebergs receive their names from the (US) National Ice Center (NIC). The NIC records and follows the drift of any iceberg greater than ten nautical miles in length. The nomenclature they use divides the Antarctic region into four quadrants, each designated by a letter from A to D.

The 'A' quadrant is from the Greenwich meridian of longitude (0°E) to 90°W, and spans the Atlantic sector, including the Weddell Sea.

Quadrant B is from 90°W to 180°E, C from 180°E to 90°E, and D from 90°E to 0°E. Each iceberg is designated by the letter corresponding to the sector in which it is first sighted, which is usually where it is formed, and a number which is next in sequence for the sector. So C16 is the 16th iceberg identified by the NIC in the 'C' sector.

When one of the tracked icebergs splits into two or more sections, each "child" iceberg greater than 10 nautical miles long is designated by the name of the parent iceberg and an additional letter. Over the time since its calving, B15 broke into many sections.

The Ross Ice Shelf spans the boundary between sectors 'B' and 'C' and thus one iceberg can be labelled

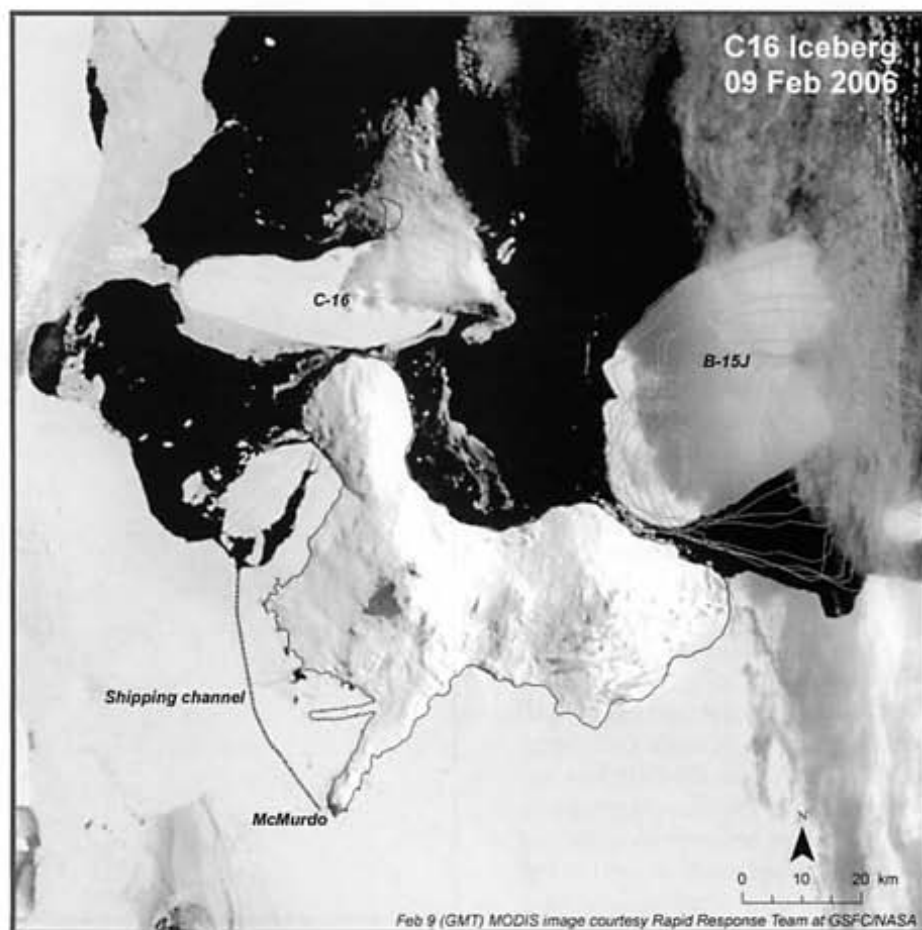
"B" and one right next to it may be "C".

The calving of icebergs, even of the size of B15, is a natural consequence of the development of an ice shelf and unrelated to global warming or 'Greenhouse' effects. Snow which has fallen on the surface of the Antarctic ice sheet compacts and forms ice as further snow accumulates on top. The ice gradually flows outwards till it crosses the grounding line, the boundary between the grounded ice and floating ice. Along large sections of the grounding line, this ice flows into floating ice shelves. Ice is lost from the ice sheet by calving of icebergs from the outer perimeter and by melting from the basal surface of

ice shelves and glaciers.

The rate of loss roughly balances the input of snow to the surface.

The total area of ice shelf lost during the year 2000 by the various calving events from Ross Ice Shelf and Ronne Ice Shelf is about 23,000 km², or around 1.5% of the area of all ice shelves around Antarctica. The total volume of water contained in just those icebergs, is over 5,000 Gigatonnes, more than twice the estimated annual turnover of ice for the whole Antarctic continent. This is equivalent to sufficient water to supply all of the world's water needs, agricultural, industrial, and domestic, for more than a year.



The section of ice shelf labelled C16 calved a few days later than B15 and has since drifted up to Ross Island, near Cape Bird. Depending on future drift, the C16 iceberg could have a major impact on the distribution and movement of sea ice, and thus on wildlife, such as the Emperor penguins of Cape Crozier, or shipping access to McMurdo Sound.



New Laboratory for Arrival Heights

The New Zealand laboratory at Arrival Heights, Ross Island, Antarctica, was designed with an eye firmly on the sky – for the past 45 years, it has provided scientists with a wealth of data on upper atmospheric physics and boundary layer air sampling studies. Ironically, ground conditions have finally forced a total revamp of the installation. “The existing laboratory was located in a low area, prone to snow build up around the structure. The building itself was starting to deteriorate – making it uneconomical to maintain and providing no guarantee of protection for research equipment housed inside” said Project Manager Peter Brookman.

Arrival Heights began life in 1959-60 with the construction of an auroral radar building. Both the New Zealand Antarctic Programme and the US Antarctic Program have laboratories situated there, conducting long-term investigations into the Antarctic atmosphere’s role in global change.

“The area, both environmentally and logistically, lends itself well to the study of upper atmospheric physics” said Mr Brookman. “Arrival Heights was designated as a protected area in 1975, on the grounds that it represents an electromagnetic and natural ‘quiet site’, offering ideal conditions for the installation of sensitive instruments for recording minute signals associated with upper atmospheric programmes.”

Over the years, there has been increasing interest in, and demand for, the type of data gathered at Arrival Heights. Over the past 45 years, New Zealand has taken an ad hoc approach to expanding the site. The current laboratory was built in 1980, with some of the old Vanda Huts ‘tacked on’ in later years to provide more space.

In 2001, Antarctica New Zealand committed to a permanent replacement of the laboratory facility. During the 2005/06 summer season, a purpose-built, prefabricated building arrived in McMurdo Sound and was immediately assembled by staff from Leighs Construction. Scott Base winter staff will continue the fit-out of the building, with completion expected by WINFLY 2006, and the site ready

for occupancy by the early science events in October 2006.

“The new building was designed with the future in mind” said Mr Brookman. “We want to be able to have the option to expand the laboratory in future and to use the area for the collaborative pursuit of scientific understanding. We have already made an approach to USAP and our eventual hope is to co-locate all Arrival Heights science in the one facility.”



Top: New Arrival Heights Building.
Bottom: Putting the finishing touches on the outside of the new building.
Photos by Stephen Robbins.

Antarctica New Zealand Pictorial Collection, K402:0506.

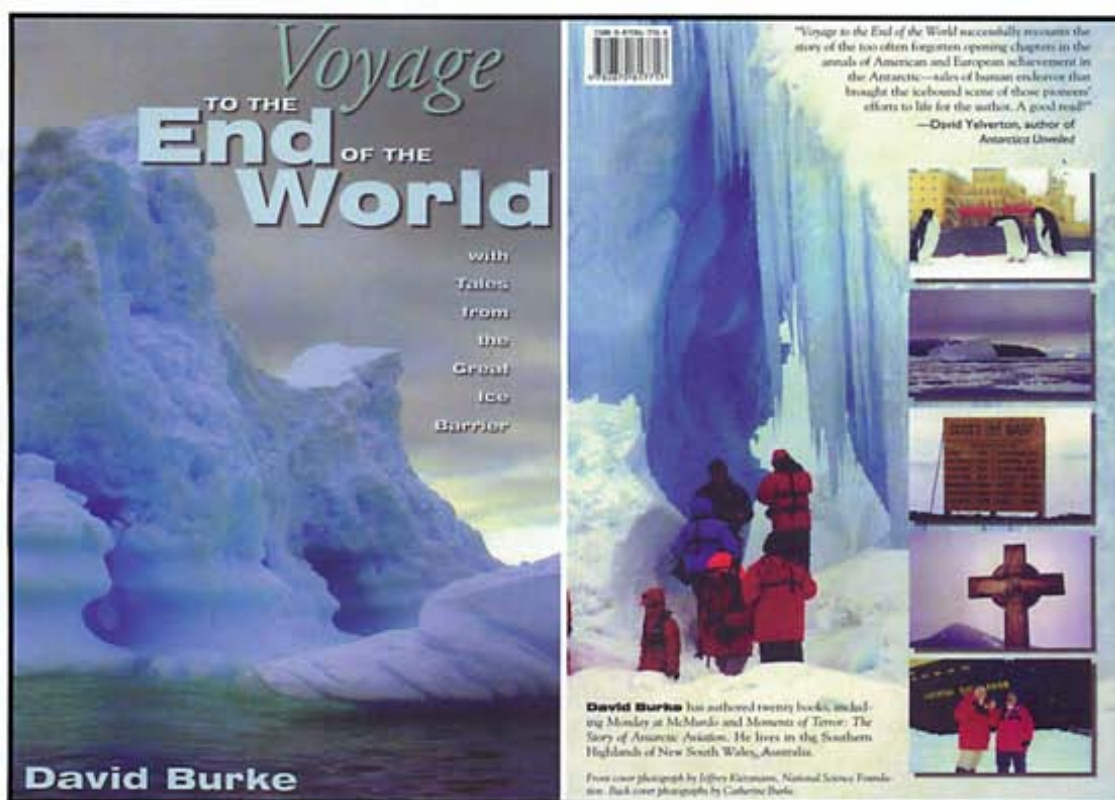
VOYAGE TO THE END OF THE WORLD WITH TALES FROM THE GREAT ICE BARRIER

By David Burke 2005, by the University Press of Colorado. ISBN 0-87081-771-X. 192 pages soft back.

Reviewed by Peter Cleary.

Using a tourist voyage of the *Kapitan Khlebnikov* to the Bay of Whales in January 2001 as a linking theme, David Burke has spliced together a series of historical vignettes and newspaper articles from his long involvement in reporting on Antarctica; first from McMurdo in 1958 (see also *Monday at McMurdo* 1967 (fiction) and *Moments of Terror: The Story of Antarctic Aviation* 1994).

The book is definitely aimed at an Australian audience, with two Australian connections strongly emphasised. Sir Hubert Wilkins is rightly given some well-deserved accolades. However describing Borchgrevink's Southern Cross Expedition of 1899-1900 as an 'Australian' expedition would rightly be argued with by some historians, some of whom argue it wasn't even 'British'. Burke's version of events of the Lincoln Ellsworth, Bay of Whales 'rescue' of January 1936 adds a new twist to how these events can be seen. Compare it to F D Ommamey (*South Latitude*, 1938) and Lincoln Ellsworth's (*Beyond Horizons* 1938) view of the same event.



Burke's descriptions of departing from McMurdo in March 1958 on the *USS Glacier* and being on board the epic Oct 1964 US LC130 flight from Melbourne, to overhead South Pole, to Byrd Station are good evocative journalism.

Sadly the photograph reproduction is not close to the standard of the originals. Photographic content, however, is excellent, with the photograph on page 130 of Admiral Byrd confronted at Dallas Airport in 1955, being a beautiful summary of the last fifty years of social change, even in

Antarctica. In some ways this book may be viewed as a tribute to the *Kapitan Khlebnikov* which has made such a large contribution to Antarctic tourism since 1990. There are strong rumours her visits to Antarctica in the future may be a lot fewer than they have been.

Peter Cleary is the Operations Planner for Antarctica New Zealand.

Hallett Station's New Home

Buildings and artefacts from Hallett Station given to the Canterbury Museum, by Antarctica New Zealand, form the basis of a major new exhibition in Christchurch.

By Rebecca Harper

The exhibition, *Hallett Station, Antarctica*, now open at the Canterbury Museum in Christchurch, will run for at least a year, depending on the proposed revitalization at the museum.

Hallett Station was built in the summer of 1956-57 in a bay in the Western Ross Sea, to mark the beginning of the International Geophysical Year, when sixty-two nations came together to undertake scientific investigation over 18 months. The base was built for both scientific and logistical purposes, in a joint New Zealand – US operation. In order to establish the base, 7800 Adelie penguins were removed from the site during base construction.

Fires at the base in 1961 and 1964 caused serious damage. After these major setbacks Hallett Station was used only during the summer. In 1973 the base was abandoned. In the 1980s a team of New Zealanders began the initial clean up of Hallett Station with a view to re-establishing penguin nesting sites. Explosives were used to destroy parts of the base and some waste was pushed out on to sea ice.

In 2000 a decision was made to completely remove Hallett Station. Teams from New Zealand made trips to the base every summer since then and in 2004-05 about 28 metric tonnes of material was bought back to New Zealand by Antarctica New Zealand.

Natalie Cadenhead, currently curator of Antarctic and Canterbury social history at Canterbury Museum, worked for Antarctica New Zealand at the time of the recovery project and assisted the New Zealand Min-



Final touches to the lighting to complete the exhibition.



*The Duck Bulldozer which arrived in 12 parts and was rebuilt by Gus McAlister, mechanic for the LGP Project.
All photos provided courtesy of Michael Kean, Canterbury Museum.*

Continued to Page 80

Thomas Orde Lees*Continued from Page 69*

back of a tram or truck. He was reported so often the police threatened to remove the pedals from his bicycle.

Drawing on his travels and adventures, Orde Lees stepped in to write the weekly column for children in 'The Southern Cross', under the pseudonym of 'Gulliver'. He took part in radio plays, and his story-telling was very popular. Always he had one eye south, to Antarctica, where he had his most testing adventures, and he became actively associated with the New Zealand Antarctic Society up to the time of his death in December, 1958. Not long before he died, his name was recorded on a small island in the Antipodes Group, acknowledging the place this most interesting man earned in this region. Ellaline, who had accepted his faith as a Roman Catholic, died in 1982.

The story of the life of Thomas Orde Lees, and a substantial part of his diary of the Shackleton experience edited from around 1000 pages, has been published by Wellington writer John Thomson in a book titled **ELEPHANT ISLAND AND BEYOND: THE LIFE AND DIARIES OF THOMAS ORDE LEES**. The book is published in England by The Erskine Press of Norwich, Norfolk, and Bluntisham Books, of Bluntisham, Huntingdon (ISBN 1 85297 076 6). Copies can be ordered through CAPITAL BOOKS of Wellington or info@capitalbooks.co.nz at PO Box 5534, Wellington, where members of the NZ Antarctic Society will receive a 10% discount on the price.

Hallett Station's New Home*Continued from Page 79*

istry of Agriculture and Fisheries with the painstaking job of processing the material. Everything was rigorously tested for contamination, lead based paints, and asbestos. The museum received an estimated 9 to 10 tonnes of material. The rest, was recycled or put in a landfill.

Gifted to the museum were five buildings, a geomagnetic hut, 64 fuel drums, scrap metal, a bulldozer and shed, plates, cups, heaters, bunks, food, shelving, signs, a dartboard, games and sleeping bags. Cadenhead said her favourite item is the cribbage board made from a packaging crate with matchsticks for markers.

"Quirky little human things amuse me", she said, "if people at the base needed something, they simply made it from any material available." Since her arrival at the museum, she has spent three months sorting and cataloguing smaller items from the base. Five hundred items have been identified, numbered and packed into temporary storage.

Museum workers are rebuilding a mock Hallett Station. Cadenhead said trying to put the buildings back together had been the hardest task. "It's like having eight different

jigsaw puzzles and all the pieces have been mixed up."

In some cases the pieces are missing. Matching up paint marks, nail holes, bolt holes and investigation into weather patterns has helped workers to put the buildings together.

The original Hallett Station site is now home to 40,000 breeding pairs of Adelie penguins. The site will be monitored regularly with soil and water tests to ensure the area is environmentally safe.

Challenges from ANDRILL*Continued from Page 71*

and the Southern Ocean over the next few hundred years" said Dr Naish who is co-chief scientist of the MIS project. Mr Cowie said "We'll be analysing glacial and marine sediments spanning the last 4 million years, deposited in the moat-like basin that has formed around Ross Island since the formation of Mount Erebus and Mount Terror."

This phase of ANDRILL involves drilling two deep holes - MIS in the 2006-2007 season and Southern McMurdo Sound (SMS) in 2007-2008. Other proposed drill sites are Granite Harbour, and the Southern McMurdo Iceshelf between Black Island and Minna Bluff.

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New Zealand (Individual)	NZ\$60
New Zealand (Family)	NZ\$67
New Zealand (Institutions)	NZ\$120
Australia / South Pacific	NZ\$70
North America / East Asia	NZ\$75
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'Antarctic' is airmailed to members.

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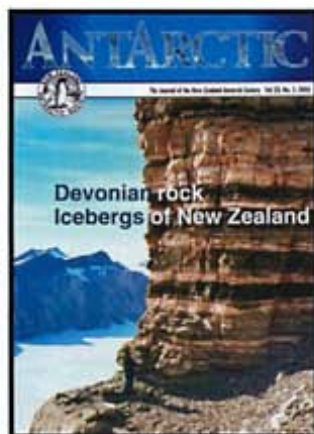
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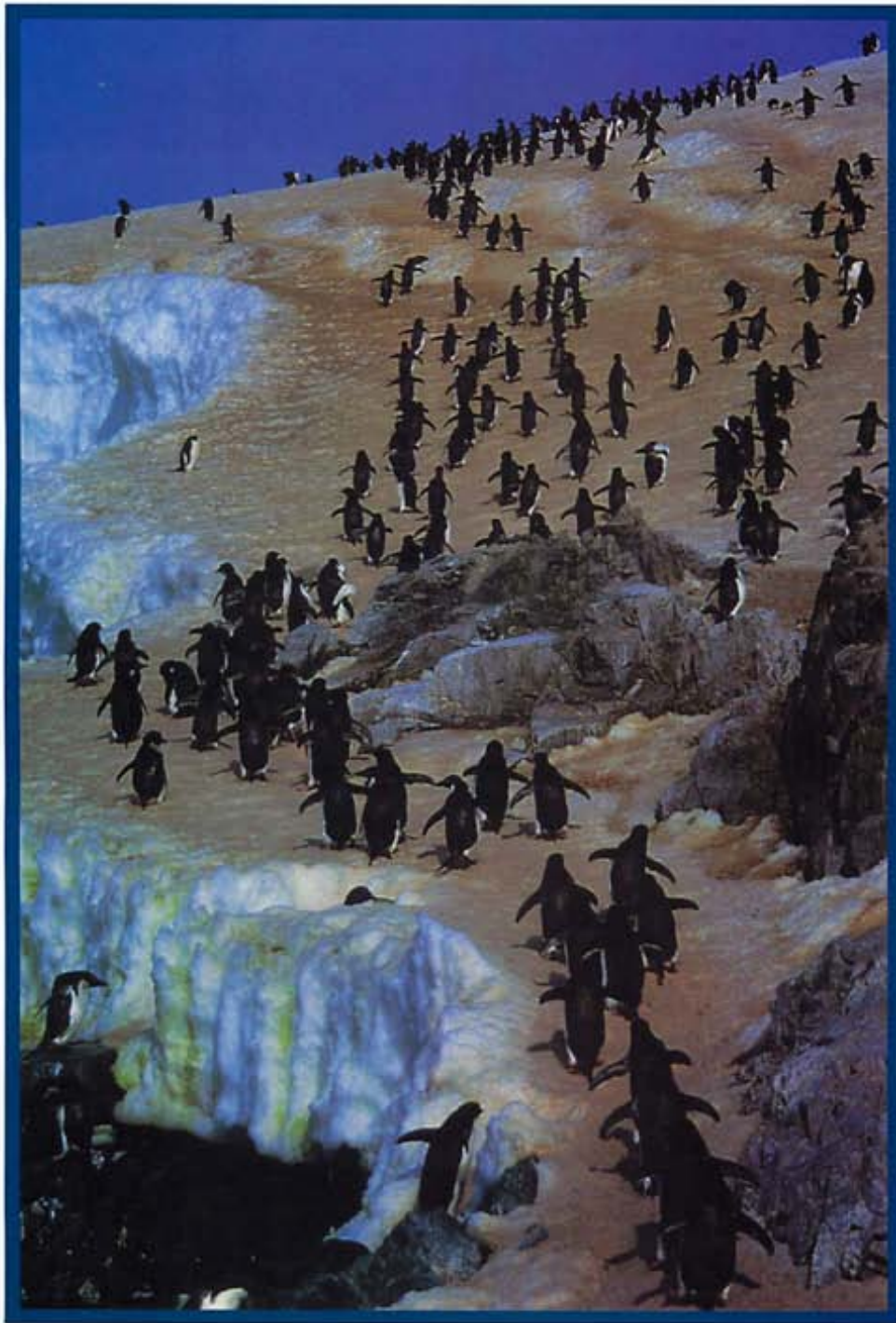
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*Like commuters in a Tokyo subway, Adelle penguins stream up a snow bank in Hope Bay on the northern tip of the Antarctic Peninsula. They are returning to nesting sites to feed voraciously hungry chicks with a pink slurry of krill.
Photo by Colin Monteath.*