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Please address all publication enquiries to:

PUBLISHER: Gusto

P.O. Box 11994, Manners Street
Wellington

Tel (04) 4999 150, Fax (04) 4999 140
Email: leigh@gustodesign.co.nz

EDITOR: Natalie Cadenhead

P.O. Box 404
Christchurch 8140
New Zealand

Email: ncadenhead@canterburymuseum.com

ASSISTANT EDITOR:

Janet Bray

INDEXER:

Mike Wing

PRINTED BY:

Format, Wellington

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Cover photo: *Antarctic scallops*. Photos by Rod Budd, NIWA

NEW ZEALAND ANTARCTIC SOCIETY LIFE MEMBERS

The Society recognises with life membership, those people who excel in furthering the aims and objectives of the Society or who have given outstanding service in Antarctica. They are elected by vote at the Annual General Meeting and are restricted to 15 life members at any time.

Current Life Members by the year elected:

1. Bernard Stonehouse (UK), 1966
2. John Claydon (Canterbury), 1980
3. Jim Lowery (Wellington), 1982
4. Iris Orchard (Canterbury), 1990
5. Robin Ormerod (Wellington), 1996
6. Eric Gibbs (Wellington), 1997
7. Baden Norris (Canterbury), 2003
8. Bill Cranfield (Canterbury), 2003
9. Randal Heke (Wellington), 2003
10. Bill Hopper (Wellington), 2004
11. Malcolm Laird (Canterbury), 2006
12. Arnold Heine (Wellington), 2006
13. Margaret Bradshaw (Canterbury), 2006
14. Ray Dibble (Wellington), 2008
15. Norman Hardie (Canterbury), 2008



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Antarctic Youth Ambassador Scheme

Antarctica is “an extraordinary place and one where, ...it suddenly hits home how important this ...continent is to the well-being of the rest of the world. You realise that you are part of something far greater, more magnificent and intricate – and more fragile – than you had ever imagined.”

Sir Peter Blake

In 2007 Antarctica New Zealand and the Sir Peter Blake Trust launched a programme enabling young New Zealanders to participate in and contribute to environmental work in Antarctica. The Sir Peter Blake Trust is dedicated to environmental education and leadership development.

The principal aim of the programme is to engage young New Zealanders in Antarctic environmental and heritage issues through the New Zealand Antarctic Programme. The individual

selected each year will be expected to contribute to Antarctica New Zealand’s environmental programme and to act as an ambassador helping to educate others through their experiences.

The Antarctic Youth Ambassador will, for the duration of their award, have all expenses met relating to: accommodation and travel to and from Christchurch, and to and from Scott Base and all required training. The Antarctic Youth Ambassador must meet his/her own expenses for:

medical clearances and examinations; insurance; personal equipment such as cameras and lap-tops; food whilst in Christchurch.

For further information on how to apply for the Antarctic Youth Ambassador programme contact:

Matt Vance
Media Advisor
Antarctica New Zealand
Private Bag 4745
Christchurch

m.vance@antarcticanz.govt.nz
Tel: +64(0)3 358 0200 

Lyttelton's Polar Gallery

In 1980, the Lyttelton Historical Museum Society took up its new quarters in the Merchant Navy Centre, Gladstone Quay and inherited several Antarctic relics which had been housed there.

By *Baden Norris, Curator, Lyttelton Museum*

These included a pair of skis belonging to William Knowles, crew member of Scott's *Terra Nova*, 1910–13, a mounted Emperor penguin believed to have been brought back to Lyttelton by a crew member of the relief ship *Morning* 1903–04 and a large brass plaque commemorating the death of Scott's polar party.

These objects along with many available photographs inspired the concept of a polar gallery. With assistance from Canterbury Museum and the public of Lyttelton the gallery soon grew to embrace the wider Antarctic story from James Cook to Sir Edmund Hillary. A broad brush indeed.

Over the years, as the value and extent of the collection rose dramatically it became obvious that a small museum, run on a shoestring budget by volunteers, was not the ideal



First visitors to the newly refurbished gallery. Photograph courtesy George Rogers

repository for many of the priceless relics. With the cooperation of the Director and staff, the collection was packed and transferred to Canterbury Museum for examination and treatment by the conservator.

While the collection was away, the Lyttelton polar gallery was cleaned and painted and a new purpose built display case, provided by Canterbury Museum, installed. The gallery was redesigned to feature stories with strong Lyttelton links, with *Discovery*, *Nimrod* and *Terra Nova* taking pride of place. The refurbished display was opened on Saturday 17 October 2009 by Anthony Wright, Director of Canterbury Museum. The opening ceremony, before a very large crowd, commenced with a few words of

welcome from the Curator, Baden Norris who thanked all those who assisted with special mention of Natalie Cadenhead and Stephen Ruscoe of Canterbury Museum.

Lyttelton Museum chairman, Tony Airs thanked all those involved and Councillor Claudia Read congratulated the society. The ribbon was cut by Mary Boyle, daughter of Felix Rooney, crew member of Shackleton's ship *Nimrod*, Gerard McCarthy, son of Mortimer McCarthy, crew member of Scott's ship *Terra Nova* and three-year old Maeve Montgomery-McCarthy daughter of a previous caretaker at the museum. The exhibit received high praise from those present and from the general public who have viewed it since. ¶



Baden Norris at the opening of the Lyttelton Museum Polar Gallery. Photograph courtesy George Rogers

Cooking at the South Pole

By Keith Reimink

“I love this place, I hate this place, I love this place, I hate this place,” Francis Sheil, South Pole Production Cook barks as he opens yet another bag of Generation 7 frozen French Fries.

“I’m never coming back,” Keith Reimink, counterpart to Francis groans as he sees “Pork Loin, 25 lbs” on his menu yet again.

“See ya next year!” they chortle in unison.

The cooks laugh, sigh, and continue their day. Francis and Keith are galley Ice veterans with 22 and 24 months respectively cooking at both McMurdo and South Pole galleys. Their banter, albeit rather cheeky, is perfectly indicative of what it means to be a cook at the Southernmost Kitchen in the World. “It’s not extremely challenging from a culinary

aspect,” says Francis. “But cooking for such a small amount of people gives you the freedom to try new things throughout your day.” He pulls the dough out of the proofer and begins to knead it. “The first thing I do every day is make fresh bread.” Francis has become famous around the station for his outstanding baking, from the steaming loaves of potato dill bread he puts out on Deli Day, to the Baked Alaska he served for Mid-Winter Dessert.

“Oh, crikey,” exclaims Jude Gregan, our Kiwi doctor. “I’ve never seen one of those before. It looks delicious!”

“It’s just frozen Frosty Boy: our bone meal and corn syrup version of ice cream. Suckers!” Francis puts his hand over his mouth in a mock giggle.

Although it doesn’t sound too glamorous or even important at

times, the South Pole Production Cooks, along with Michele Gentile, their Sous Chef at the helm, are literally responsible for the lives of 43 community members during their stay at the South Pole. “The majority of these people work outside for hours at a time at temperatures approaching -100° F [-73° C],” says Keith. “It is a huge responsibility to keep them fed, keep them warm, and keep them happy. Nobody really complains; they just want calories: food that sticks to their ribs. ”That’s not difficult. The menu seems to be engineered for that specific purpose: a five-week cycle heavy on the red meat and starch.

“This is where the aggravating part of the job starts,” Keith quips while thumbing through the next month of menus. “We are simply



Finishing touches to the Baked Alaska, South Pole style.
Image courtesy Jude Gregan



Above: South Pole chefs, Francis Sheil and Keith Reimink
Below: Francis Sheil with Baked Alaska. Image courtesy Jude Gregan



given a protein for each day: Cornish game hens, shepherd's pie, pork loin, chicken breast, tenderloin, lamb. How we cook it and what accompanies it is totally up to us." Keith, who has been cooking in this kitchen for the better part of a year, sighs and shakes his head. "I can't believe I have to dream up yet another vegetarian entrée."

"It's not extremely challenging from a culinary aspect, but cooking for such a small amount of people gives you the freedom to try new things throughout your day."

However daunting the planning of meals at the South Pole may seem, the biggest challenges in the kitchen usually have nothing to do with meal preparation. "It's a tiny little space," says Francis. "And you're packed into it with the same three people for a nine month period, most of which is spent in total darkness." It is easily the most visible job on the station. Each of the three chefs is entirely responsible for their own shifts, which they rotate between themselves every six weeks. There is no place to hide, the door is always open, and there is nothing but a buffet barrier separating them from the entire station. "Temporary solitude becomes invaluable in a dark, frozen desert," says Logan Grover, South Pole Winter Site Manager. "The kitchen staff does not have that opportunity and they certainly have met the additional challenge of maintaining a good working relationship with their peers while forced to be in a difficult environment."

Perhaps the most visible challenge to the rest of the community is the lack of fresh, well, *anything*. When the last C-130 leaves the skyway in mid-February, that is the last form of transportation in or out of the South Pole until the sun comes up and temperatures climb. This usually happens in early October; a long

eight months away. The trio of cooks are then able to prepare their daily meals with nothing but what exists on site. "You can't go down to the local grocery store and pick up what you need for dinner," Keith says. "Either you have it or you don't and you have to make do." The last flight in February left the cooks with a

considerable amount of "freshies". But when those are gone they rely solely on frozen fruits and vegetables that sit patiently in cardboard boxes on a cargo deck just behind the kitchen, and a smattering of baby cherry tomatoes, cucumbers and salad greens that are planted, grown, harvested and served sporadically throughout the winter from the in-station greenhouse. The last red onion was so precious that, rather than eat it, the cooks rested it in a glass of water so as to marvel at the brilliant green scallions that emerged. There was a virtual mutiny on station when one morning it turned up missing. "We still don't know the whereabouts of our onion," says Keith. "I suspect it fell off the counter and into the garbage can. Others think it was foul play. Whatever." Towards the end of the winter a relatively fresh item of food is a treasure worthy of an archaeologist. "Look, look!" says French IceCube scientist Camille Parisel, rushing up to Francis with a recently found Mars candy bar. "Look! It is almost not expired!"

The palates at South Pole are almost as eclectic as the people that possess them. "It's impossible to please everyone," says Francis under his breath. "You cook what's on the menu with what you have available." A major bone of contention this winter

has been curry, the frequency of. "I consider myself a connoisseur of fine Indian cuisine," quips Ross Williamson of the South Pole Telescope. "And the curry in the galley ain't bad."

"It's not a terrible taste. I can get it down," shrugs George Fantasia, South Pole Maintenance Foreman. "But it's like drinking sour milk, ya know? It sucks."

"Some people like to try things. Some people are good ole boys. They like meat and potatoes," Keith shouts over the grinding of the garbage disposal. "You get a healthy mix of tastes so you just do what you can and hope that people understand your limitations."

It is now early October. The sun is up. Flights are scheduled. And dinner conversation centres on fresh food. Certain words are heard floating above others at the dining room tables. "Christchurch." "Sushi." "Two Fat Indians." "Dimitri's Kebab." "Dux de Lux." The cooks don't take it personally. "I want fresh food as much as the next guy," says Keith. "I've been opening bags of frozen stuff for so long I wouldn't know what to do with a fresh tomato if it fell into my lap."

"I took a huge pay cut to come and cook down here," says Francis, who has spent a good deal of his career opening and managing restaurants in the Lawrence, Kansas area. "It's not about the money or the cooking; it's for the experience. The window of my berthing overlooks the South Pole Dome. How many people in the world can say that?"

"Yeah, I'll be back," mulls Keith as he scratches an ever-growing unsanitary beard. "Despite the challenges, the South Pole is a lifestyle choice now. Every season is different, every community has a special vibe to it, and every time you set foot back in the real world you appreciate everything you experience just a little more. I really like that."

I love this place, I hate this place.
I'm never coming back.
See you next year! 🐧

Chelsea Cucumber Anyone?

Mike Wing and Nic Jackson from the New Zealand Antarctic Society (NZAS) were selected from numerous applications as the first participants in the new volunteer scheme set up by Antarctica New Zealand and the NZAS.

Mike has a background in biosecurity and is a seasoned Antarctic with two winters as dog handler in 1974 and 1976 and a season of drilling with the CIROS project in 1986 under his belt. Nic, with an interest in polar heritage, visited Scott Base in 2002 as part of Gateway Antarctica's then Graduate Certificate in Antarctic Studies course.

This is their story...



*Touching up lettering on the Scott Base sign.
Photograph courtesy Matt Morley*

Experienced in painting windows? Okay with heights? Can you assemble scaffolding? Happy to work a six-day week? We made it through the interview, passed the medical and before long we were winging our way to Christchurch and then to McMurdo Sound for Christmas at Scott Base.

We flew to Scott Base on the Globemaster, a C17 US aircraft and touched down to a beautiful day on the Ice. We were quickly whisked away in Ivan the Terra Bus to McMurdo and then by Toyota to Scott Base. From the moment we arrived Mike began noticing many changes since his earlier visits. The most noticeable were the three wind turbines recently constructed on Crater Hill which create a backdrop to Scott Base. They only began operation the month we arrived and create enough energy to power Scott Base plus boosting McMurdo Station's supply 3 km away. The little green base itself has changed too and can now house about 80 folk (staff and event personnel) comfortably – a large increase from Mike's last visit.

In 1986 the new Base had been started but was far from complete. Mike was often comparing 'old' with 'new'. The old Base was smaller, more compact and more 'homely' whereas the new Base is much larger, more spread out and has facilities suitable for a new age. There are now flush toilets, clothes dryers, computers, hand-held radios, e-mails, and Internet access. Another big difference was the much stronger safety and environmental ethic, instituted by Antarctica New Zealand, where emphasis is placed on personal responsibility. The Base surrounds were tidy and free from litter. On a more personal note, keeping in touch with home was far easier compared to the one phone call a week in the 1970s. The Hillary Field Centre is the most recent new building and other recent work has seen changes to the dining room and

the addition of a lovely lounge. Under construction was the new cold porch and changing area with a corridor to bypass the mechanics area. At least the Trans-Antarctic Expedition (TAE) hut and flagpole still exist as a remnant and reminder of the original base built in 1957.

Following a briefing, and sorting out our equipment with the help of 'chippies' Moose and Matt, we got straight down to painting after morning tea on Day Two. We started off painting the four easy windows on the 'new' deck at the entrance to the administration building, using scaffolding for the high windows.

run to pack up and finish at 5 pm or shortly thereafter. After a shower we were ready for dinner with dessert at 6 pm. The chefs Gazza and Bobby never seemed to run out of creative and delicious meals for everyone.

We experimented with paint drying times and could, in one day, prepare, (scrape, sand and fill) undercoat and two hours later apply the first of the two top coats. The paint colours used are Chelsea Cucumber (or RBT green) for the light green and Deep Fir for the dark green for the window frames. We worked primarily on the main base buildings but also on the TAE Hut which was a



Nic painting windows on Cape Bird hut

We enjoyed the views from the Base as we painted – looking South past White and Black Islands. We used a site plan to identify the windows to paint and whether they needed scaffolding to reach them. The working day started with an Engineering Team briefing and then we were out painting; morning tea 'smoko' at 10 am with munchies everyday (scones, bacon and egg pastries, oranges, biscuits or leftover desserts); then back painting, lunch at noon, more painting, afternoon tea at 3 pm, and then the final paint

great honour. When it snowed heavily we did inside painting jobs.

Before being allowed off base we had to undertake Antarctic Field Training (AFT). We were in fine company for our AFT as we were joined by Errol and Geronimo who were involved in collecting soil samples for research into the effects of human activity on the Antarctic environment. Mike and Errol were well seasoned in alpine activities and Geronimo (from Spain) was almost a legend having

Continued over ►►



*Creative approaches to tackling the higher windows.
Photograph courtesy Regan Stead-Hill*

climbed Mount Everest and worked in Antarctica nine times. AFT consisted of a half-day of safety briefings (including first aid in cold climates, helicopter safety and environmental considerations), collecting our gear to overnight in the field and setting off in the Hagglund to a camp area just past the ski field and within sight of the A-frame Hut site. The A-Frame burnt down in 2009 and is now just a charred patch that keeps on coming up through the ice. We pitched a new style of polar tent and one with a fancy vestibule, both made by One Planet. Nic opted for a bed of ice and slept in a snug ice trench.

The main choices for after work evening activities included having a drink at the Tatty Flag bar at Scott Base, watching DVD's in the movie room, email, trips to the ski field, rugby practice (Nic joined the team and played her first international test match against the US – of course

New Zealand won!), going to bars or the coffee shop at Mactown (McMurdo Station), walking up Crater Hill, around the pressure ridges, or up Observation Hill, or cross country skiing along the road to Willies airfield.

Christmas Dinner at Scott Base was held on Christmas Eve so as many staff as possible (including the chefs) could take Christmas Day off. We had a feast! A seafood platter to start, turkey and ham with vegetables for the main, and a truly outstanding dessert buffet – fruit cake, a profiterole cake, Christmas pudding with custard, individual lime cheesecakes, a gingerbread house, truffles and meringues. Secret Santa was held after dinner and many people got very thoughtful handcrafted presents – it was amazing what people had made.

A highlight of our stay was the trip to Cape Bird on the northern part of Ross Island to paint the hut. Cape Bird hut is like a tramping hut at the beach;

right on the water and sharing the place with 135,000 penguins (40,000 adult breeding pairs with approximately 40,000 chicks, and 15,000 vagrants). Kerry and Isaac undertaking penguin research were fantastic hosts. When we weren't painting the hut we were lucky enough to help out, under supervision, with band searching and keeping chicks warm. We also spied many skuas with chicks (and were frequently dive-bombed), orca (some distance out), a leopard seal looking for lunch, a Wilson's petrel and plenty of Weddell seals.

As our time on Ross Island drew to a close we tallied up our achievements. We painted 60 windows and completed other painting work as well. The scheme was certainly a success and we felt honoured to be chosen to have this amazing experience. Our sincere thanks go to Antarctica New Zealand and the New Zealand Antarctic Society for making it happen. 🐧

Whisky and Brandy Excavated at Cape Royds Hut

A New Zealand Antarctic Heritage Trust team of conservators has excavated five crates from beneath Ernest Shackleton's only Antarctic hut.

Team leader Al Fastier explained that “[w]e thought there were two crates possibly containing whisky under the 1908 building. To our amazement we found five crates, three labelled as containing whisky and two labelled as containing brandy. The unexpected find of the brandy crates, one labelled Chas Mackinlay & Co and the other labelled The Hunter Valley Distillery Limited Allandale are a real bonus.”

Ice has cracked some of the crates and formed inside them which will make the job of extracting the contents

very delicate. The team is confident that the crates contain intact alcohol, given liquid can be heard when the crates are moved. The smell of whisky in the surrounding ice, before excavation commenced, also indicated full bottles of spirits were inside, albeit that one or more might have broken.

Richard Paterson, master blender at Whyte and Mackay, whose company supplied the Mackinlay's whisky for Shackleton described this as “a gift from the heavens for whisky lovers. If the contents can be confirmed, safely extracted and analysed, the original

blend may be able to be replicated. Given the original recipe no longer exists this may open a door into history. We look forward to working with the Trust to try and replicate the whisky for mutual benefit, allow people to taste a true part of history and be part of what must be the whisky story of the century.”

The Antarctic Heritage Trust's approach to how best undertake this unprecedented and delicate conservation task will be determined in the coming months. †



Brandy crate found at Royds Hut. Image courtesy New Zealand Antarctic Heritage Trust

Mackinlay's whisky crates found at Shackleton's hut. Image courtesy New Zealand Antarctic Heritage Trust

Haskell Strait, Antarctica: The Last Great Strait?

Dr Timothy G. Haskell, one of New Zealand's premier Antarctic scientists, has recently been honoured by the naming of the water body between Cape Armitage and Cape Spencer-Smith, immediately south of McMurdo Sound.

Haskell Strait separates McMurdo Sound from the vast oceanic basin beneath the Ross Ice Shelf. The Strait itself is around 25 km wide and in places over 900 m deep. Currents of nearly half a knot have been measured, although typical flows are lower. For comparison, Haskell Strait is as wide as Cook Strait and has throughflow comparable to the Straits of Gibraltar. Although the Strait is mostly covered by the ice of the Barrier (the McMurdo Ice Shelf), on rare occasions sea-ice breakout exposes the north-west corner. This section of the Strait then becomes navigable, and vessels can actually moor off Scott Base.

Until sea level rise and reduced ice coverage change the shape of our oceans, Haskell Strait is likely to be the last great strait to be named in the world. It may have been overlooked previously because it is perennially ice-covered and is dominated by the Barrier (the McMurdo Ice Shelf). However, it dwarfs the other named ice-covered straits in the area – for example, Moraine and White Straits,

which separate Mina Bluff from Black Island and White from Black Islands, respectively.

The Strait was the scene of great drama during the Heroic Era. Cherry-Garrard's description of the Scott parties' attempts to get themselves and their ponies off disintegrating sea ice, past patrolling orca, and onto the Barrier makes for harrowing reading. That account also motivates today's elevated awareness of safety amongst teams working in the region.

Today, Haskell Strait hosts some exciting and important science. As it is one of the southern-most large straits in the world, it is heavily influenced by the earth's rotation. It's also the western gateway to the Ross Ice Shelf cavity – an enormous, essentially unknown body of water. The cavity is a major source of supercooled water, i.e. water chilled at great depths under the ice shelf to temperatures below that of freezing. Such water influences sea ice growth, which in turn affects climate processes at a global scale. How this water enters McMurdo Sound, and what it's



Tim Haskell in Antarctica. Photograph courtesy Pat Langhorne

replaced with, have been the subjects of recent work based out of Camp Haskell (the colloquial name for sea ice-based infrastructure that Tim Haskell has developed over the last 15 years).

During his earlier Antarctic seasons, Tim, along with Bill Robinson and Arnold Heine, aimed to record iceberg calving from the nearby Erebus Glacier Tongue, an event

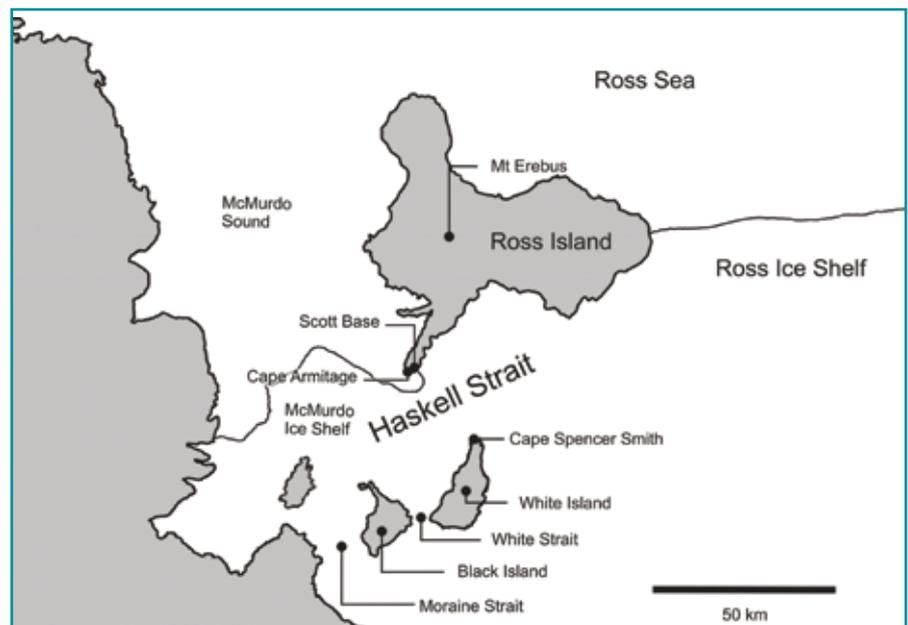
Looking across Haskell Strait to White and Black Islands. Photograph courtesy David Plew



Camp Haskell on the McMurdo sea ice. Photograph courtesy Jim Renwick

that occurs only every few decades. It was only a matter of weeks after the team recovered its instruments from the site that the long-awaited event occurred. Tim likes to claim that their unsuccessful attempts to observe it precipitated the calving event – such is his influence on nature.

Over the past 30 years Tim Haskell has led 40 scientific expeditions, totalling more than 900 days “on the Ice” – and many more days of planning and preparing back in New Zealand. Tim has authored over 100 scientific publications, approximately half of which are concerned with the oceans of Antarctica. His contributions have related not only to the fine-scale details of understanding the physical processes of how an ice-covered ocean works, but also to developing robust operational methods for experimentation on ice–ocean interaction. Further to this, he has an international reputation and has conducted ground-breaking experiments in challenging environments, including the marginal ice zone and the polar ocean in winter. He has also contributed greatly to science back in New Zealand, most notably with the earthquake-



Map showing location of Haskell Strait.

resistant bearings upon which key infrastructure in Wellington sits.

Tim is highly regarded in the New Zealand science community and is without doubt one of our leading senior scientists, having received the New Zealand Antarctic Medal, the Royal Society Hector Medal, the Marsden Medal and the Royal Society Science and Technology Medal. The naming of Haskell Strait is well-

deserved and appropriate recognition for Tim’s services to New Zealand’s scientific and logistical operations in Antarctica.

The authors would like to thank Pat Langhorne (University of Otago), Mike Williams (National Institute of Water & Atmospheric Research) and Wendy Shaw (Land Information New Zealand). 

Tales of a National Representative

Every year a number of sturdy vessels cross the Southern Ocean taking their cargo of adventurers/ tourists south to experience the Antarctic. Tourism has been steadily on the increase over the last two decades, with tourist numbers going from 6,700 in 1992/93 to over 35,000 according to the Ministry of Foreign Affairs and Trade website. While most of these numbers visit the Peninsula a growing number of vessels visit the Ross Sea with 1200 expected to have visited this summer. In a place where science has historically been the main activity, tourism is often viewed with caution or concern. It can produce a number of devoted and sometimes influential advocates for the region but it can also bring with it, impacts.

By Jan Clayton-Greene

Before a New Zealand vessel, or any vessel heading to the Ross Sea region, can travel to Antarctica it must submit an Environmental Impact Assessment (EIA) to the Minister of Foreign Affairs and Trade for his consideration. The Minister then issues a notification/permit to the operator under the *Antarctica (Environmental Protection) Act 1994*, which implements the *Protocol on Environmental Protection to the Antarctic Treaty* into domestic law. As part of the notification/permit the Minister directs the operator to include a National Representative on board during the expedition to Antarctica.

In February 2009 I was appointed the National Representative (NR) on board Aurora Expedition's vessel, the *Marina Svetaeva* which travelled to the Ross Sea from Bluff. This was the third time I had been appointed to this role.

As a NR your job is to observe and report to the Minister on compliance with the requirements of the *Antarctica (Environmental Protection) Act*, the undertakings contained in the tour operator's EIA and with any ministerial directions issued by the Minister of Foreign Affairs and Trade regarding their proposed activities. The Act sets out serious penalties for those that do not comply. You must also supply a report to the Ministry of Foreign Affairs and Trade, after completing the voyage.

Additionally you are asked to report any vessels sighted in the Ross Sea region (including those detected only on radar) to the Ministry of Fisheries. Illegal, unregulated and unreported (IUU) fishing in the Southern Ocean is of growing concern to New Zealand and other members of the Commission for the Conservation of Antarctic



Marina Svetaeva in the sea ice just off from the Dry Valleys.
Image courtesy Jan Clayton-Greene



Passengers waiting to visit Scott's Hutt at Cape Evans.
Image courtesy Jan Clayton-Greene



*A lone person contemplating the Canada Glacier in the Taylor Valley Tourist Zone.
Photograph courtesy Jan Clayton-Greene*

Marine Living Resources (CCAMLR), and sightings provide an important source of information of vessels operating in the CCAMLR Area. Antarctica New Zealand also asks the NR to assist in the collection of data at various landing sites, to help in their work monitoring the impacts of tourism in Antarctica.

The duties of this role commence once the vessel passes 60 degrees South. Usually you are in a dual role, representing the Department of Conservation to supervise and report on visits to the New Zealand Sub Antarctic Islands en-route there and back. The magnitude of all this responsibility hits home when, for comparison, you visit the Australian managed Macquarie Island, where a whole team of staff join the expedition and supervise the landings – a whole team doing the task that you as a solo individual undertake in the New Zealand patches!

I was with a great team, both staff and passengers. The staff knew what they were doing and, as is frequently the case, the passengers became self regulating, and made an effort to minimise their impact on the areas and wildlife they visited. The sea ice had broken up and we made it into the Ross Sea. This was a major achievement given that the previous year the expedition I was on was thwarted by a band of thick sea ice.

The expedition successfully visited a number of sites including Borchgrevink's hut at Cape Adare, Cape Hallett, Franklin Island, Scott's *Terra Nova* hut at Cape Evans, Canada Glacier Tourist Zone, McMurdo Base and Scott Base. On the way home we zodiac cruised off Cape Bird and had helicopter flights around Coulman Island.

A couple of landings stand out. This was my fifth visit to the Antarctic but my first visit to Scott's Hut at Cape Evans where time has stood still. After reading so many of the stories, it was humbling to visit such a place, look at the provisions and equipment and imagine what it may have been like. Revisiting the Dry Valleys was a special event. In a "previous life" I had spent several weeks in Taylor Valley as a student including one Christmas Day. It was hard to believe I was finally returning after more than 20 years. The rules around my visit might have changed but the landscapes were still as impressive as ever.

It is an interesting role being a NR; you spend several weeks in close proximity to a ship-load of people you have never met before. You are not a passenger, nor staff or crew but have an independent role. It can be challenging but it also offers a different insight into what this continent means to people, whether it is the history, the wildlife, the landforms or the polar experience. 🦋

Antarctic Marine Calcifiers and Increasing Ocean Acidification

Antarctic marine ecosystems are vibrant, colourful and teeming with life. This is especially true in the coastal Ross Sea, where our studies over the past decade have revealed a high diversity and abundance of seafloor organisms. These invertebrates are well adapted to living in extremely cold waters (-1.92°C in McMurdo Sound), surviving on little food and in dim light under sea ice for much of the year.

By Vonda Cummings, Marine ecologist, NIWA, Wellington.

Antarctic molluscs, echinoderms (for example, sea urchins) and other ‘calcifiers’ build their shell or skeletons from calcium carbonate that is obtained from their environment. They are notably more fragile than their counterparts from more temperate regions. Their shells are very thin, and are easily fractured during collection and handling. One reason for this difference is that cold Antarctic waters contain much less carbonate than other oceans. This means that these ecosystems are even more susceptible to increasing acidity of the oceans – a process known as ocean acidification.

What is ocean acidification?

Oceans are a major sink for atmospheric carbon dioxide (CO₂). As levels of atmospheric CO₂ continue to increase, so too does the amount

absorbed by the oceans. This process alters the seawater chemistry so it becomes more acidic, and the availability of carbonate for calcification decreases. This reaction may even dissolve calcium carbonate shells/skeletons. Predictions are that Antarctic waters will be under saturated in aragonite, one of the most soluble forms of carbonate, by 2030.

How will ocean acidification affect Antarctic marine calcifiers?

We really don’t know the answer to this question, although we have our suspicions. There have been few studies of responses of Antarctic marine organisms to ocean acidification. The process of calcification itself requires energy, and if this process becomes more difficult then there are likely to be physiological costs to the organism. In addition, enzymes used in the calcification process have developed in

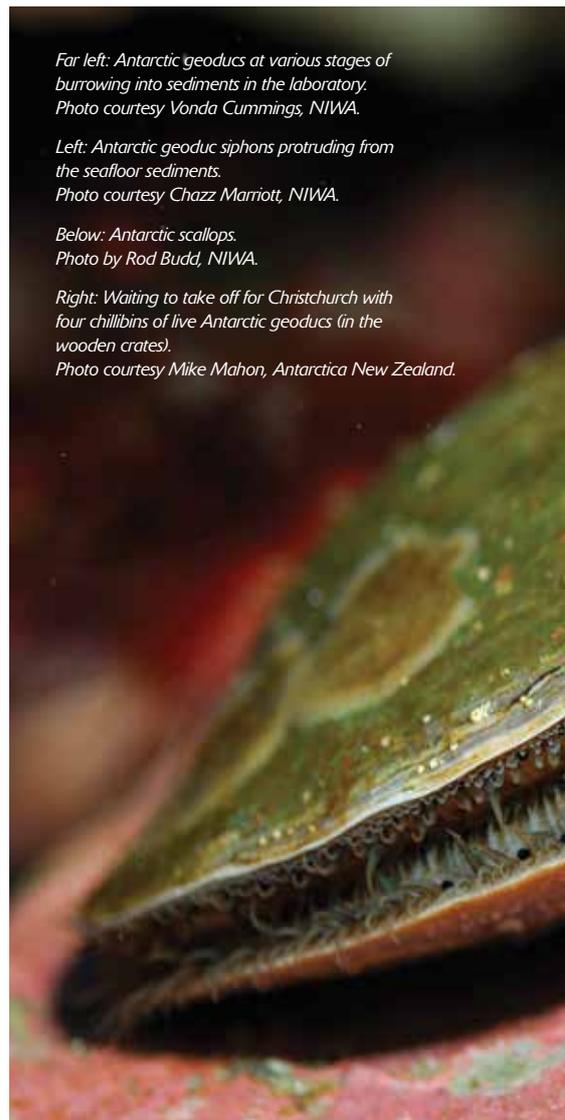
line with the present water conditions – whether these will work as well or the animal can adapt in changed conditions remains to be determined.

Far left: Antarctic geoducs at various stages of burrowing into sediments in the laboratory. Photo courtesy Vonda Cummings, NIWA.

Left: Antarctic geoduc siphons protruding from the seafloor sediments. Photo courtesy Chazz Marriott, NIWA.

Below: Antarctic scallops. Photo by Rod Budd, NIWA.

Right: Waiting to take off for Christchurch with four chillibins of live Antarctic geoducs (in the wooden crates). Photo courtesy Mike Mahon, Antarctica New Zealand.



The very real concern for Antarctic organisms is whether they will be able to adapt as quickly as the ocean chemistry is predicted to change. This is particularly relevant to species such as Antarctic geoducs and scallops which live for many decades.

What are we doing?

In the past two years our research has involved experiments with Antarctic bivalves. Antarctic geoducs and scallops are common in the Ross Sea and elsewhere around the Antarctic continent. They occur in a variety of habitats, from the shallows to over 400 m deep for geoducs, and 1500 m

for scallops. They can be very abundant – for example, at our Granite Harbour collection site there were more than 100 geoducs per m². These bivalves are key members of Antarctic seafloor communities, and are important prey for starfish, fish and worms.

In summer 2008 and 2009 SCUBA divers carefully collected specimens of scallops and geoducs. These were transported to NIWA's Antarctic facility at Mahanga Bay, Wellington. Here we manipulated the acidity of the seawater under simulated Antarctic conditions, and monitored the effects on survival, growth and biochemical functionality of these bivalves.

Our initial results clearly show a decline in physiological condition (fitness) at levels of acidity predicted for high latitude Antarctic waters in the following decades. Once completed, the ecological implications of our findings will be assessed in light of what we know about the role of these species in the functioning of Ross Sea coastal ecosystems.

This research by the 'IceCUBE' team is part of an International Polar Year Foundation for Research Science and Technology (FRST) funded project COX01707, with logistical support from Antarctica New Zealand. ❄



South Pole Science

Some say that science at the South Pole is big, and they wouldn't be wrong. Two large multi-million-dollar astrophysics experiments currently operate close to the Amundsen-Scott South Pole Station: the South Pole Telescope and the IceCube Neutrino Observatory.

By Ross Williamson, South Pole Telescope scientist, Winter over 2009

Big isn't always beautiful though, and there are many smaller, just as important experiments running at the bottom of our planet, in fields ranging from atmospheric physics to seismology. Some of these experiments are so successful they have been running in one form or another since the 1970s.

The experiment closest to my heart is the one I work on: the South Pole Telescope. This is a 10-metre-diameter radio telescope, designed to look for undiscovered clusters of galaxies. Galaxy clusters are the largest objects in space that are gravitationally bound together, the seeds of which formed in the early Universe. Observing these clusters allows us to find out more about dark energy, a substance that is gravitationally repulsive and makes up over 74 per cent of the mass of the Universe. It is this dark energy that is causing the space between galaxies to expand at a faster and faster rate.

Why though was this 10-metre telescope installed at the South Pole? It's all about the weather. Water is in the nightmares of astronomers who observe in the microwave frequency bands, as it absorbs the light from

the objects we are trying to observe. The South Pole is the driest place on the planet – with temperatures as low as -70°C most of the water is locked up in ice and there is very little present in the atmosphere. This makes for a crystal clear sky for microwave telescopes to observe through.

The other large installation at the Pole, IceCube, is probably one of the strangest but most ingenious telescopes ever built. It is not a telescope in the conventional sense, but a cubic-kilometre-wide array of light sensors, called Digital Optical Modules (DOMs), buried up to 2500 metres in the Antarctic ice. These light sensors measure the intensity of the Cherenkov radiation emitted when leptons (such as electrons, muons or taus) have enough energy to travel faster than the speed of light through the ice. These leptons come from the very occasional scattering of high energy neutrinos with a water molecule (ice, in this case), and that is why the South Pole was chosen as a location for this experiment. By having nearly 5000 of these DOMs reacting to the passage

of leptons, the computers that run the experiment can determine where on the sky the neutrinos came from and its energy. The aim for the IceCube Neutrino Observatory is to measure extremely high-energy events, such as supernovae and gamma ray bursts.

The South Pole is one of the quietest places on the planet for radio interference. There are no radio stations down here, and this makes for a perfect place to put radio receivers that look for events happening in the upper atmosphere. One such detector, the Stanford VLF (Very Low Frequency) receiver, has been operating at the South Pole since 1976. The sun is constantly shedding a stream of particles into space, which we call the solar wind. The solar wind gets intercepted by Earth's atmosphere, where it energizes, creating the ionosphere, a shell of electrically charged atoms and molecules that surrounds the Earth at a height above 50 kilometres, all the way out to 1000 kilometres. By measuring the intensity of the radio waves given off by the ionosphere, scientists on the Stanford

The South Pole is the driest place on the planet – with temperatures as low as -70°C most of the water is locked up in ice and there is very little present in the atmosphere.

VLF project can track the activity of the sun and its solar wind.

One beautiful effect of the solar wind is the Aurora Australis, or the Southern Lights. Like a fluorescent bulb, which excites phosphor atoms to produce visible light, the solar wind flows down the Earth's magnetic field towards the poles and impacts with the oxygen and nitrogen atoms in the atmosphere. These atoms then emit red and green light that appears to dance around the sky. There tend to be aurorae almost every day at the South Pole, which are detected by numerous all-sky cameras located on various buildings. These cameras are very sensitive, and so during the winter the whole area around the station has to be blacked out. With the windows darkened and no bright lights outside, the South Pole makes for one of the most beautiful views of the night sky anywhere on the planet.



Photographs showing the the 10 m diameter dish of the South Pole Telescope. The giant cogs need greasing every few weeks, and this job is sometimes shared by members of the community. Photograph courtesy Ross Williamson

The glacier above the Pole is constantly moving, at around 10 metres per year. Even so, the Pole is one of the most geologically stable places on the planet. A seismometer located eight kilometres away from the station is part of the Global Seismic Network, which provides measurements of earthquakes occurring around the world.

Other experiments that operate continuously at the Pole are an

observatory to detect meteors, and the US National Oceanographic and Atmospheric Administration (NOAA) research station that tracks quantities of atmospheric gases, such as ozone and carbon dioxide. In addition, a multitude of other experiments come and go throughout the summer season. The South Pole is an incredible place to carry out world-class science. 1



Exploring Antarctica in the Documentary Research Centre

By Joanna Condon

If Antarctica is a challenging environment today, we can only imagine what life was like there in the past. The words and images of our predecessors can help us to understand their experiences – and to appreciate how they paved the way for present opportunities for science and discovery. The Documentary Research Centre offers access to Canterbury Museum's Antarctic archival and pictorial collections and information resources: here are some highlights from our recent acquisitions.

In 2009 the Museum purchased an order book kept by Admiral Sir Charles Royds (1876–1931) while First Lieutenant of the National Antarctic Expedition (*Discovery*), 1901–1904 led by Robert Falcon Scott. This important book was used to record lists of staff, orders and routines. It includes details of the funeral of Able Seaman Charles Bonner who died in Lyttelton Harbour by falling from the mast of the *Discovery* in a tragic start to the expedition.

In the same year our Museum was generously gifted a collection by the family of last surviving member of one of history's most famous expeditions. Lyttelton man William 'Bill' Burton (1888–1988) was a crew member on board the ship *Terra Nova* during Scott's British Antarctic Expedition, 1910–1913. In 1963 Burton returned to the Antarctic as a guest of the US Navy, along with fellow expedition members Mortimer McCarthy and William McDonald. Burton's diary of that return trip is held at the Museum along with a range of documents, photographs and objects relating to the *Terra Nova* expedition. The collection includes sound-recorded interviews; it is a rare treat to listen to Burton's rich mariner's voice recalling his *Terra Nova* days.

More voices from Antarctica may be heard thanks to the New Zealand Antarctic Society's oral history project. Antarcticans who made history during the International Geophysical Year, 1957–1959 and the Commonwealth Trans-Antarctic Expedition, 1957–1958 have been interviewed, and the recordings deposited with the Museum.

From the 1960s era, the Museum was recently gifted a collection for Robert Clements, Senior Scientist at Scott Base for the 1960/1961 Antarctic season. Diaries, correspondence, slides and movie film provide a window into life at Scott Base and work in the field during this period of Antarctic history.

Many other documents from the Heroic Era to more recent times can be found in the collection, as well as reference books and journals. Visiting times are from 1.00 pm to 4.30 pm Monday to Friday, and enquiries may be emailed to docinfo@canterburymuseum.com 📧



William Burton (head stoker, *Terra Nova* crew) standing beside ponies on deck circa 1910. Canterbury Museum 2009.80.17

Poets Corner

This poem was written by Marjorie Smith, age 83 who lives at Cashmere View Retirement Village, Christchurch.

A group of 17 residents from the village visited the Antarctic Attraction in September 2009.



The Cashmere Jaunt – A Day at the Antarctic Centre

By Marjorie Smith

A Tuesday in September
Was a day for us to remember.

When we packed in the bus
Well, there were 17 of us.

Off we went on our way
Towards the airport for our day.

To the Antarctic Centre aptly named
And where the penguins are world famed.

Through the gate we anticipate
Of what we'll see to appreciate.

Our guide took us underground
Where the little penguins were swimming
around.

Darting here and there very quick
Their flippers going flat stick.

Their keeper called each by name
As they ducked and dived playing a game.

Most had a defect of a kind
So being cared for is very kind.

Then onto the 'chilly bin'
Gwen, Leonore and Joan were going in.

Dressed up in jackets and rubber boots
Waddling along like three happy hoots.

It got very dark and very chilly
Not half as cold as poor willy.

They said it was very cool
I didn't go, I'm not a fool.

Then, a highlight hard to beat,
We all went in and sat on a seat.

A hearty chap, who used to teach
Set about and started to preach.

All about Antarctica and the Ross Sea,
The wonders down there for us to see.

Big planes the people go in
All packed like sardines in a tin.

Wonder of wonders on planes no loo!
Alas, alack what a to-do!

Does one cross the legs and hope like hell
That nature doesn't start to tell?

A New Zealander, of course a kiwi
Invented a thing called the 'Shivi'.

No good for us with creaky knees
We'd have no use for these 'Shivis'.

He told us too how they lived in the snow
For 6 weeks on end and did you know.

No washing or changing their clothes
Guess you would hold your nose!

All in all a jolly good chap
So we all gave him a mighty clap.

Then off we trooped for a cup of tea
A scone, a cake and a coffee

A piece of fudge came our way
All in all a lovely day.

So, on the bus the 17 heads
Back to the village and our beds.

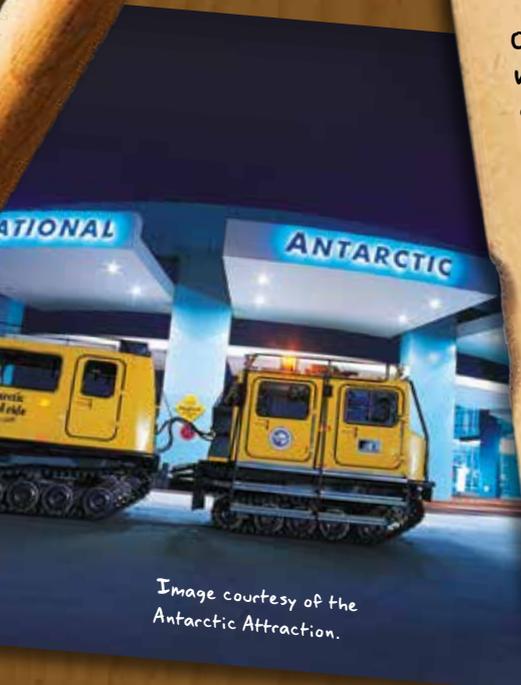


Image courtesy of the
Antarctic Attraction.

Crevasse Roulette

By Jon Stephenson

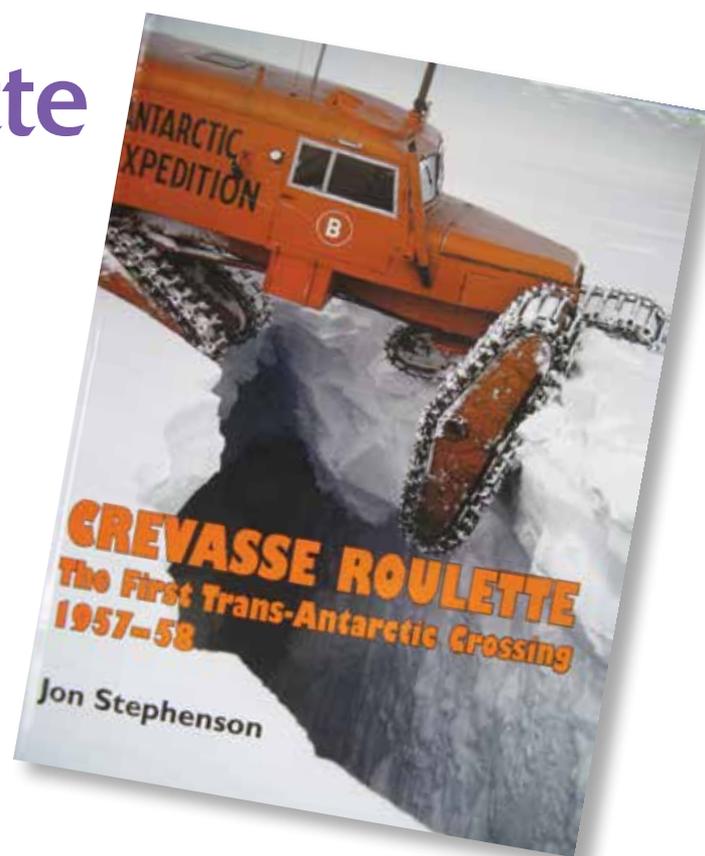
It is a special treat when a tale of adventure combines with a work of historical significance. When the subject matter is the exploration of Antarctica we can be assured that will be the case. Such a book has been recently written by Dr Jon Stephenson, a geologist and the sole Australian representative on the first expedition to cross the southern continent, during the summer of 1957–58. The Commonwealth Trans-Antarctic Expedition, or “TAE”, was led by Dr Vivian Fuchs, former director of the FIDS (Falklands Islands Dependency Survey) Scientific Bureau, and included the New Zealand Support Party led by Sir Edmund Hillary.

Stephenson, a young geologist aged 26, was selected not only for his enthusiasm and geological expertise but also because he was an Australian. This helped fulfil the Commonwealth nature of the expedition. As a member of the 12-man UK crossing party Stephenson was ideally placed to experience the full range of challenges presented by the expedition. He joined two others in a group who wintered-over at the edge of the Polar Plateau at the advance base, “South Ice”, three hundred miles inland from the departure base, “Shackleton”, which was located at Vahsel Bay on the Weddell Sea. Stephenson and his travel partner Ken Blaiklock became the first people to travel to the South Pole by dog-sled since Amundsen. Stephenson also became the first Australian to reach the South Pole.

It is our good fortune that Jon Stephenson, more than 50 years later, has persevered and produced a highly readable and beautifully illustrated and informative account of mankind’s “last great journey”, as it was aptly put by Sir Ernest Shackleton. The book takes us through the advance party efforts of 1955–56, to the completion of the crossing itself in March 1958 when Fuchs and his tractors, with Hillary acting as guide, arrived at New Zealand’s Scott Base.

The book also provides coverage of several associated topics, including an overview of previous expeditions and biographies of expedition members in later years. Science is not ignored, and the author’s deep understanding of both geology and glaciology rewards the reader with insight into the geography that was traversed, and with analysis of Antarctica’s nunataks and other geological features.

One aspect that places this volume on solid footing with the accounts of the Heroic Age of polar exploration is the wonderful collection of photographs taken by the author and judiciously placed throughout. His photo of



Fuchs and Hillary in their tent at Depot 700, where Hillary joined the Crossing Party, is particularly poignant, given the press-fueled issues of their working relationship. The book is especially useful, as Stephenson does not shy away from giving us a UK party view of the New Zealand Support Party activities, including Hillary’s “dash to the Pole”.

As a bonus we have appendices describing previous expeditions, the idiosyncrasies of the Weddell Sea ice, and even aspects of polar ship design. The book format is excellent, with clear type and well illustrated explanations of specific topics. Reference notes and a comprehensive bibliography have also been included.

Jon Stephenson, as an “insider”, has given us a well researched and balanced account of one of the great geographical exploits of the twentieth century. Anyone who has an interest in mankind’s exploration of our planet will not only enjoy reading it but will want to keep it at hand as a reference work on Antarctica. ¶

Book reviewed by Stephen Hicks, Gateway Antarctica, University of Canterbury

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Reviews of books provided by authors and publishers to Antarctic reflect the opinion of the reviewer.

Errata: Matthew O’Sullivan’s name was incorrectly spelt in Issue 210, Vol 27, no 4, 2009, page 80. We apologise for this error.



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Holding the wind turbine WEC2 hub and blade guide rope as the mast is lifted into position.
Photograph by Scott Bennett, Antarctica New Zealand Pictorial Collection: K427:09/10:033