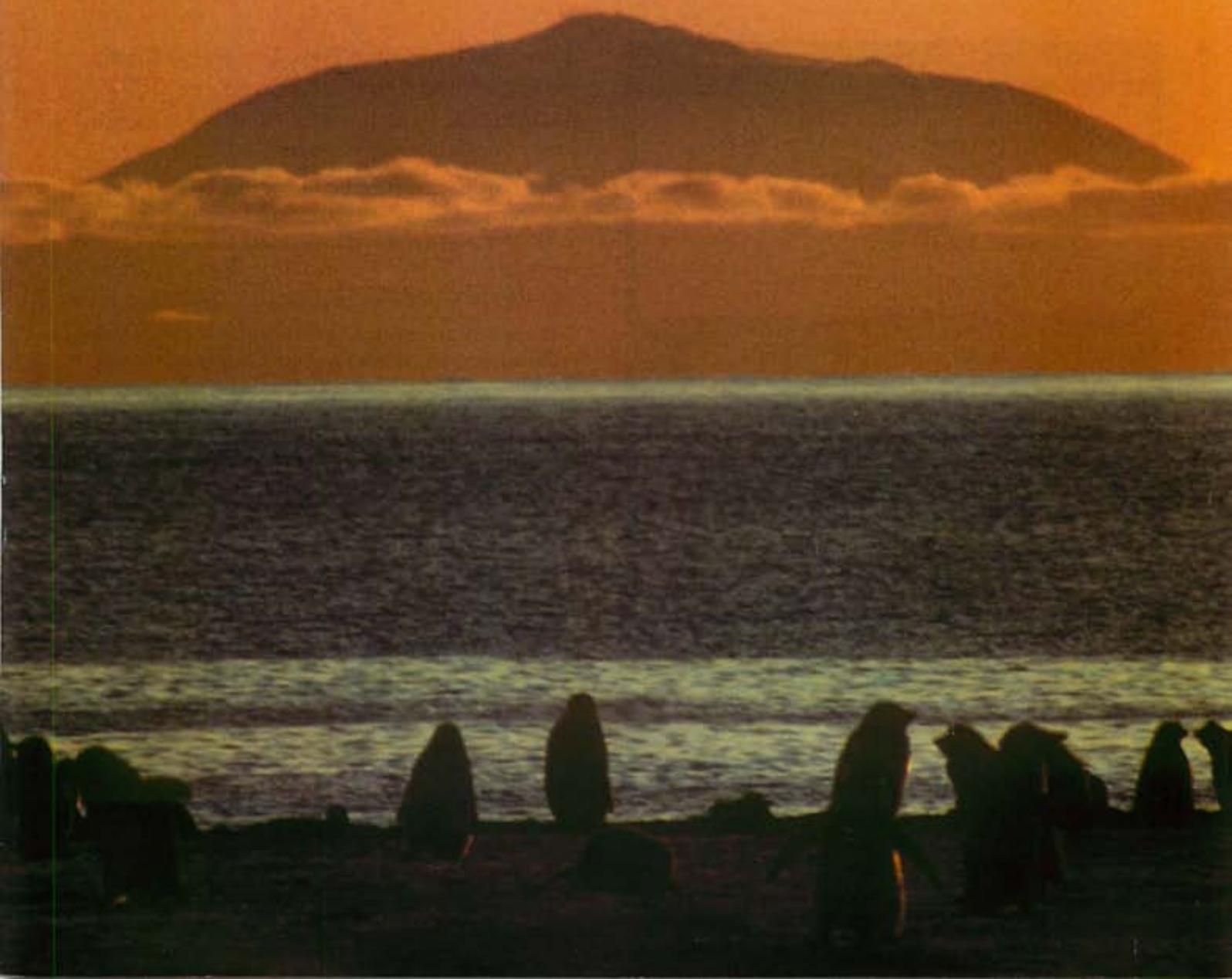


ANTARCTIC



The Journal of the New Zealand Antarctic Society Vol 22, No. 4, 2004

Erebus Remembered



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COVER



Cover photograph: Sunset on Mt Erebus from Adelie penguin rookery, Franklin Island. Photo: Colin Monteath.

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The Legacy of Erebus

The Mt Erebus disaster remains one of Antarctica's historic tragedies.

On November 28, 1979, a wide bodied DC10 jet operated by Air New Zealand flew into the lower slopes of the world's southern most active volcano, the 3794-metre high Mt Erebus in Antarctica, instantly killing everyone on board.

The disaster was at first inexplicable. The crash investigators found that the big jet was operating perfectly. The tape of the cockpit conversations between the pilots revealed nothing untoward till the very final seconds. The hundreds of photos taken by the passengers showed the plane was flying in clear air in good weather.

It was the aviation puzzle of the decade. How could a modern aircraft with the most sophisticated navigation equipment available fly into a towering mountain in broad daylight without anyone aboard seeing what was coming?

The controversy that followed the answers has barely died all these years later.

Chief air accident inspector Ron Chippindale's June 1980 report on the crash blamed the pilots, accusing them of flying too low in flagrant

Twenty five years after Air New Zealand flight TE901 crashed on Mt Erebus, Antarctica, killing 257 passengers and crew, a Remembrance Ceremony was held at Scott Base and wreaths were laid at the location of the disaster. DAVID MCLOUGHLIN of The Dominion Post sorts out the reality from the myths that surround the disaster.



Wreaths are laid in remembrance of the victims of the crash of TE901. Reverend Peter Beck with Cabinet Minister Phil Goff in foreground and at top right, Lou Sanson, CEO Antarctica New Zealand, Paul Hargreaves, Chairman Antarctica New Zealand and Graeme Tod.

breach of airline orders, while not knowing what they were.

A diagram published with his report, showing the plane apparently flying in aimless circles, helped fuel that the perception that TE901 smashed into the mountain while it was hopelessly lost in clouds.

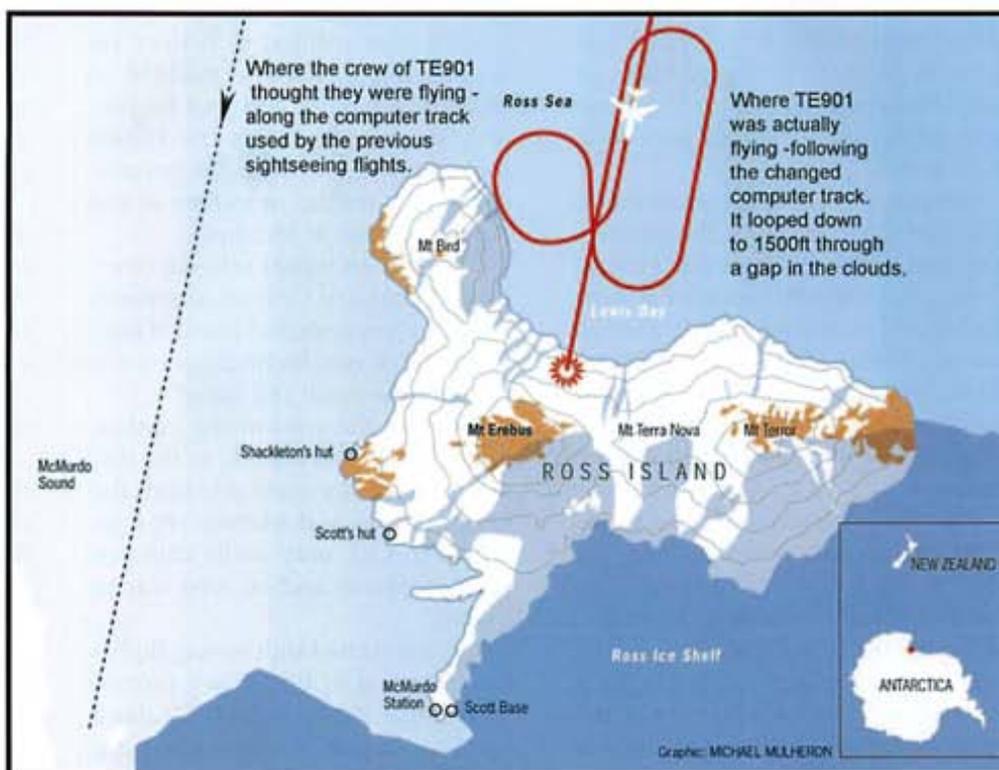
Royal commissioner Justice Peter Mahon, whose report was published almost a year after Mr Chippindale's stunned the nation by accusing Air New Zealand of a massive cover-up of a computer blunder he said caused the crash.

Exonerating the pilots of all blame, Justice Mahon said the computer navigation track of TE901 had been altered just before the flight, shifting the flight path from the safe flat expanse of McMurdo Sound to a collision course with Mt Erebus, without the pilots being told of the change.

Captain Jim Collins, First Officer Greg Cassin and everyone else on the flight deck, including seasoned Antarctic explorer Peter Mulgrew, completely failed to see the looming disaster ahead of them.

Justice Mahon said this failure had two causes. They believed they were over McMurdo Sound, the route of the previous sightseeing flights, the route Captain Collins was told he was going on at the flight briefing a few days before. And they were fooled by the optical illusion known as "white out", caused by the sun shining from behind on to snow and ice below and clouds above, making it look as if they were flying over endless flat ice when, in fact, the ground was rising quickly.

In phrases that rang around New Zealand and around the world, Justice Mahon, an eminent judge of the High Court, said Air New Zealand had presented his royal commission with "palpably false evidence" that originated "in a predetermined" plan of deception that could not have been the result



THE LAST FOUR MINUTES OF TE901

An edited cockpit transcript

3 minutes 53 seconds from impact

"Peter Mulgrew speaking again, folks. I still can't see very much at the moment. I'll keep you informed as soon as I can see something that gives me a clue to where we are - we are going down in altitude now and it won't be long before we get quite a good view."

3:16 "Where's Erebus in relation to us at the moment?" *Flight engineer Gordon Brooks.*

3:14 "Left about 20 or 25 miles left, do ya reckon?" *Mulgrew.*

3:07 "I'm just thinking of any high ground in the area, that's all." *Brooks.*

2:53 "That's the edge." *Mulgrew.*

2:12 "We might have to go down to 1500 here, I think." *Captain.*

"Probably see further anyway." *Co-pilot.*

2:06 Sound of altitude alert.

1:50 "I reckon Bird's through here... and Ross Island's there... Erebus should be here." *Mulgrew.*

1:09 "Actually those conditions don't look very good at all, do they?" *Captain.*

1:07 "No, they don't." *Mulgrew.*

0:47 "That looks like the edge of Ross Island. There." *Mulgrew.*

0:31 "I don't like this." *Brooks.*

"We're 26 miles north. I'll have to climb out of this." *Captain.*

"It's clear to the right and ahead - you're clear to turn right."

There's no high ground if you do a 180." *Co-pilot.*

"No - negative." *Captain.*

"500 feet." *Brooks.*

"400 feet." *Brooks.*

"Go round. Power, please." *Captain.*

of mistakes or faulty memories. "I am forced, reluctantly, to say that I had to listen to an orchestrated litany of lies," he wrote on one of the most thundering denunciations penned in the report.

Political and public pandemonium followed. Morrie Davis, the airline's high profile chief executive, felt forced to resign. Prime Minister Sir Robert Muldoon, a friend of Mr Davis, savaged Justice Mahon and his report. Pilots and aviation experts took entrenched sides, some supporting the Chippindale report and blaming the airline.

Air New Zealand went to the Court of Appeal in an attempt to have the Mahon findings overturned. The court stridently criticised the judge, ruling he should not have accused the airline of a cover-up without putting the allegation to its witnesses at the royal commission. Stunned, Justice Mahon resigned.

Justice Mahon, increasingly isolated, appealed to the Privy Council, which, in a damning decision in October 1983, said he had "failed to observe the rules of natural justice" – about the harshest thing that could be said about a judge. Air New Zealand declared itself vindicated. The Government and the airline's supporters hailed the Chippindale report as the only true account of the disaster.

Somewhere in all the smoke and fire, myths developed that remain to this day. The many critics of the Mahon report, both pilots and knowledgeable lay people, still say that Captain Collins caused the disaster by ignoring Air New Zealand's "minimum safe altitude" requirement and taking the DC10 down to 1500 feet in a mountainous terrain without establishing where he was.

They say that any standing the Mahon report had ended when it was "overturned" by the Court of Appeal and the Privy Council and that Justice Mahon was out of his depth when he conducted the royal commission.

Equally, the many pilot and lay critics of the Chippindale report continue to say that Mahon was right to identify the changed computer co-ordinates, not notified to the crew, as being the main cause. DC10 jets were navigated by their computer systems,

the Mahon backers say, and Captain Collins was entitled to believe he was flying down the middle of McMurdo Sound, and that he had only descended below the 16,000 foot safety height with the permission of air traffic controllers at the American base at McMurdo.

The Mahon report was not overturned, they say. Only its comments about an "orchestrated litany of lies" were struck out. Its findings on the cause of the crash still stand.

Despite the continuing controversy, the events leading to the disaster are readily verifiable from the Chippindale and Mahon reports, which in fact, only really differ in their emphasis and on who was to blame.

Qantas started sightseeing flights to Antarctica in 1977. They proved so popular that Air New Zealand quickly began its own, leaving Auckland in the early mornings to fly to Ross Island, where New Zealand and the United States have permanent scientific bases, Scott Base and McMurdo Base.

The flights did not land on the ice. On reaching the McMurdo Sound area, they would descend to low levels and make slow passes around the island and the bases there, before climbing back to cruising altitude and returning to New Zealand.

At the time, DC10 jets were navigated by computerised inertial navigation systems that were so accurate that the plane could fly for thousands of kilometres on automatic pilot and be lined up with the runway at its destination with little input by the flight crew. (They did not, however, have the amazingly accurate global positioning satellite equipment of today -systems that probably make a repeat of the Erebus crash impossible.)

Before each flight, the crew programmed the computer with the latitude and longitude of a series of "way points" along the intended route, the details being supplied by the airline's flight operations division.

The waypoints for the sightseeing flights took the jets down the centre of McMurdo Sound to a point west of the airfield near Scott Base. Most

flights before TE901, however, were flown manually in the McMurdo area to give passengers the best views. That meant the pilot disconnected the navigation computer before following the programmed track down the sound.

Early on the morning of November 28, the final waypoint for the Antarctic flights was changed by Air New Zealand's flight operations section from the middle of the sound to a beacon near the airfield. The effect of *this* change was to shift the flight path 43 kms to the east.

In the recriminations that followed, the airline claimed it had merely corrected an "error" and that the McMurdo route itself was a mistake. It said Captain Collins was at fault for disregarding the 16,000-foot safety height, which would have flown it safely over the summit of Mt Erebus.

However, nobody told the crew. It is clear from their comments preserved on the cockpit voice recorder that they believed at all times they were over the Sound, not flying toward the mountain.

Peter Mulgrew was heard saying, "Taylor on the right", a reference to the Taylor Valley, which would have been on their right if flying down the Sound, and there were references to Mt Erebus being on the left.

Other flights had enjoyed cloudless, sunny days, but, as the TE901 approached Ross Island, the area was covered in cloud. Captain Collins asked McMurdo for a radar letdown, then, when he saw a big gap in the clouds, got permission to descend through it under "visual flight rules".

It was the diagram in the Chippindale report of this descent, in two large loops, that conveyed the mistaken impression of flying lost in circles, when the DC10 was in clear air at all times.

Once down to 2000 feet, Collins switched back to the computer track, believing it would take him swiftly down the sound to Scott Base. But, instead, he was flying over Lewis Bay, directly at Mt Erebus, which rose, hidden, into the cloud ceiling above the plane. Both the Chippindale and Mahon reports said the whiteout effect would make it near impossible for the crew to see the rising ground ahead, while the Mahon report said

EREBUS REMEMBERED

that the entrance to Lewis Bay looked like the entrance to McMurdo Sound.

Astonishingly, only one crew member had flown on such a flight before, flight engineer Gordon Brooks. He was the only person to voice any concern. Just 26 seconds before impact, he said: "I don't like this."

Captain Collins immediately decided to fly away. He was heard discussing with the First Officer Cassin whether to turn left or right, when, suddenly, the ground proximity warning system shrieked its terrifying alarm: "Whoop-whoop! Pull up!"

But it was too late. Seconds later, TE901 disintegrated as it hit the slope.

The debate that has raged since has really been over who to blame. Did Captain Collins descend recklessly, without first identifying where the mountains were? Or was the airline at fault for not telling him about the changed computer track?

The 16,000-foot safety ceiling was soon shown to be a smokescreen. Air New Zealand had claimed flights were not allowed lower than that till south of Ross Island, and that they were not allowed lower than 6000 feet at any stage. But a succession of pilots at the royal commission said they had flown as low as 1500 feet in the area with the full knowledge of the airline. They were after all, sightseeing flights and there was not much to be seen from 6000 feet or 16,000 feet.

Mr Chippindale initially upheld the height restriction claims, but in an interview in 1989, on the 10th anniversary of the disaster, he acknowledged that Air New Zealand had only made the claim to try to avoid insurance liabilities. He accepted that previous flights had also gone down low and that the airline had condoned it.

Mr Chippindale had now retired. The weekend of the anniversary was also his golden wedding anniversary, doubtless making the 25th anniversary of the Erebus disaster doubly poignant for him. But he was reluctant to talk about it.

"I try to keep a low profile on it

these days," he says. "A lot of people have paid the price for what happened, and its time everyone moved forward."

Critics have said Justice Mahon would have written a different report if he had had an aviation expert sitting with him. Well he did have access to one such expert, retired air marshal Sir Rochford Hughes, who was the technical adviser to David Baragwanath, QC, the lawyer assisting the inquiry.

Like many of those who became part of the aftermath, Sir Rochford is now dead, but in 1989 he made it clear he thought, Justice Mahon was too lenient on the pilots. "Mahon wrote his report on Erebus entirely on his own, without any reference to either David Baragwanath or certainly myself," Sir Rochford said then.



"It was completely contrary to some of the things we had urged him to take cognisance of."

The judge had rightly pinpointed poor organisation inside Air New Zealand for sending flights to Antarctica that were woefully unprepared, but he let his sympathy for the dead pilots cloud his views, Sir Rochford said.

"He felt they were fully entitled to rely implicitly on the inertial navigation system which they used on regular routes, but... that had its limitations on the Antarctic route and I don't think any of the air force authorities or I would agree that was the way an Antarctic flight should be conducted."

Captain Collins should not have descended without being picked up on radar first or without identifying the high ground, Sir Rochford said. For not doing so, he had to bear his share of the blame with the airline.

Justice Mahon's findings on the

cause of the crash were not overturned by the Court of Appeal and the Privy Council. Their decisions relate only to his allegations against the airline of a conspiracy.

In its decision, the Privy Council went out of its way to laud the judge's "brilliant and painstaking investigative work", but said there was no evidence of a conspiracy and Justice Mahon should not have accused the airline of one without giving a chance to respond.

Justice Mahon died in August 1986, a folk hero to many New Zealanders who felt he had been treated shabbily by the Muldoon government for exposing the truth about TE901.

Many people, including a group of fellow judges, urged the Labour Government elected in 1984 to knight Peter Mahon, but it did not happen. When he died, there was a clamour of calls, including newspaper editorials urging a post-humous honour.

Sir Geoffrey Palmer, who was minister of justice and deputy prime minister at the time, seemed particularly disdainful to the idea of knighting Justice Mahon and he remains so to this day.

"Justice Mahon was a very eminent New Zealander and he did a lot of good things, but (the Erebus report) wasn't one of them," Sir Geoffrey said caustically.

Asked why he had opposed granting a knighthood, Sir Geoffrey said: "The courts found he had breached natural justice, it's quoted all the time. Those were difficulties that didn't warrant the hero status people had of him."

In its 1983 decision, the Privy Council expressed the wish that everyone caught up in the Erebus conflagration would move on from it. "The time has now come for all parties to let bygones be bygones so far as the aftermath of the Mt Erebus disaster is concerned. The time for bitter feelings is over."

It was fond hope then, and probably just as faint all these years later.

Reprinted courtesy of The Dominion Post.

EREBUS Tragedy Remembered

Residents at Scott Base and nearby McMurdo station stood in remembrance of those who had perished in the Erebus tragedy at a commemorative service, held at Scott Base on November 28th 2004. The service was led by the Very Reverend Dean Peter Beck from Christchurch Cathedral, with support from Father Ron Bennett, Priest at the Chapel of the Snows, Antarctica.

Antarctica New Zealand CEO Lou Sanson said that the Erebus tragedy had touched every New Zealander with the loss of so many lives in such an isolated place. "The beauty of that mountain will forever be associated with a nation's grief. The impact on families, friends, colleagues and recovery crews was immense."

"I remember vividly when they switched the lights on at Invercargill airport and the plane was long overdue. Our hearts were sinking but we still held out hope that somehow it would return. Then the news came that no-one wanted to hear."

The church service included messages of remembrance from relatives of those who died, and from Air New Zealand staff and crew. It also included readings and reflections from Sir Edmund Hillary, the Hon Phil Goff, Minister of Foreign Affairs, Antarctica New Zealand staff and the US National Science Foundation representative Dave Bresnahan, who was at McMurdo in 1979 when the crash occurred.

Poet laureate Bill Manhire wrote the poem "Erebus Voices" especially for Sir Edmund Hillary to read at the church service. In the poem, Mt Erebus speaks and the people respond. Composer Christopher Cree Brown also created a musical piece especially for the occasion.

Prior to the Scott Base service, a small group from Scott Base flew to



Mt Erebus to lay wreaths at the cross marking the nearby site of the tragedy. A brief ceremony included sprinkling water from Aoraki Mt Cook onto the ground at the memorial site in remembrance of all those who died.

A new volume of private remembrances for those affected by the Erebus disaster is being compiled by Antarctica New Zealand. A collection of messages from the families of the 257 killed in the 1979 crash were compiled for the 20th anniversary and are now kept in a locked cabinet at Scott Base.

'EREBUS VOICES'

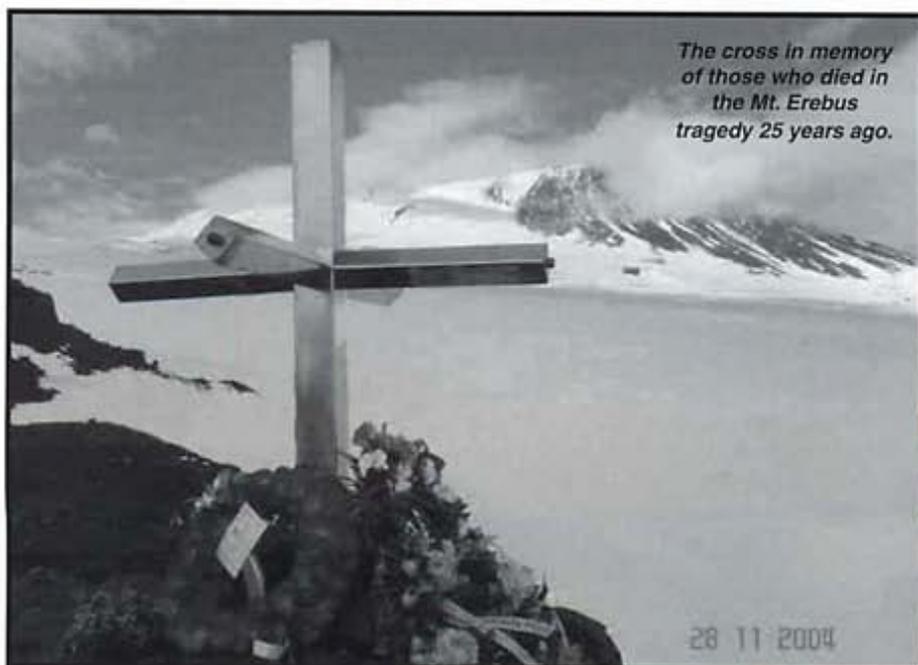
By Bill Manhire

The Mountain

*I am here beside my brother, Terror.
I am the place of human error.
I am beauty and cloud, and I am sorrow;
I am tears which you will weep tomorrow.
I am the sky and the exhausting gale.
I am the place of ice. I am the debris trail.
I am as far as you can see.
I am the place of memory.
And I am still a hand, a fingertip, a ring.
I am what there is no forgetting.
I am the one with truly broken heart.
I watched them fall, and freeze, and
break apart.*

The Dead

*We fell.
Yet we were loved and we are lifted.
We froze.
Yet we were loved and we are warm.
We broke apart.
Yet we are here and we are whole.*



The cross in memory of those who died in the Mt. Erebus tragedy 25 years ago.

Eerie Experience of Exposed Wreckage

Newspaper reporters have a reputation for resilience, often of a hard-bitten kind, but there is sometimes a moment that even the most hardy will find emotionally testing.

For Dominion Post editor Tim Pankhurst, such a moment occurred when he caught his first glimpse of the landing zone for the helicopter that had flown up from Scott Base to the fearful slopes of Mt Erebus to mark the 25th anniversary of the crash of TE910.

For years pilots flying back and forth over the crash site had seen no signs of the downed DC-10 aircraft, the wreckage being buried beneath the alpine snows.

Not on this particular day, the day of the 25th anniversary.

Pankhurst had the only media place available on the helicopter and for NZ Press Association and the Fairfax Group was covering the wreath-laying visit of a small group flying to the mountain this clear November day.

"The helicopter went over the saddle between the peak of Mt Erebus and a smaller mountain and there was a team from Victoria University doing field work on the saddle," Pankhurst says. "We flew across the saddle and angled in towards the memorial site."

"Someone had calculated that with the drift of the snow and ice that the aircraft wreckage would lie below the surface some 2kms down from the crash site". Suddenly, unexpectedly, Pankhurst saw a piece of the wreckage, "Half an engine and an orange cargo webbing and then there was the fuselage..."

"It was an absolute shock to see it. I've never experienced anything like it before. It was a physical reaction - I felt as if I'd been punched!"

When the helicopter landed, Pankhurst got his bearings. "I could see for miles across the sea, out to where the B-15 iceberg was holding the pack ice. On the far horizon I



The Dominion Post Editor Tim Pankhurst, on the ice.

could see icebergs in the open sea and looking to the far west I could see an island.

"I was suddenly aware I could see Beaufort Island and I thought that if the pilots had looked out and spotted Beaufort Island to the right they would have been able to conclude that the plane was on the wrong side of the island.

"Erebus is a big mountain of similar height to Mt Cook and it was quite an eye-opener to see that the wreckage is so low down the mountain, well below the saddle."

The eerie re-emergence of the wreckage of TE901 has been attributed to warmer atmospheric conditions in Antarctica during the summer of 2004-05.

Norway to establish Antarctic satellite centre

The Norwegian Space Centre plans to invest more than NOK 100 million (\$US15.8 million) on a satellite communication centre at the Norwegian research base Troll in the Antarctic.

The aim is to process and forward satellite data on climate, weather, environment and navigation.

The location of the research base Troll on Queen Maud's Land

makes it easier and quicker to process meteorological information from satellites.

This makes it possible to make more precise forecasts.

The Norwegian Space Centre (NSC) already operates a smaller satellite communication station at Troll, but now plans to install three larger antennas.

The construction may start in the 2005 summer season.

Sir Ed Hillary names New Scott Base Building

The newest building in Antarctica, was named the Hillary Field Centre during a visit to Scott Base by Sir Edmund Hillary in November 2004.

The \$NZ4.7m (US\$3.4m) all-purpose warm store is the single largest construction project ever undertaken at Scott Base. Once completed it will provide a heated, bulk stores facility and field operations support area. It will also improve Antarctica New Zealand's ability to support large science field events and will signify the



Above and Below: Construction underway on the new field centre.



completion of Scott Base as a world class Antarctic research facility.

Antarctica New Zealand CEO, Lou Sanson said it was a great honour that Sir Edmund Hillary, who erected the first building at Scott Base, the Trans-Antarctic Expedition (TAE/IGY) hut, had agreed to have the newest building on base named after him.

"There's a nice symmetry about the founding father of Scott Base being here to see the final stage of his base completed. Naming our biggest and best building after Sir Edmund is a fitting tribute and reflects the high regard in which this great Antarctic is held by all of us."

Sanson said that once completed, the new facility would consolidate

field support and stores in a single location, resulting in enhanced safety and comfort for field personnel and Scott Base staff.

"Since the base was established in 1957, these operations have been conducted from various unheated buildings which has been especially challenging for staff in the winter."

Anthony Leighs, managing director of Leighs Construction, which has had a team of nine builders based in Antarctica erecting structural steel framing and cladding, said the company's work on Hillary Field Centre has made it the first private sector construction provider for New Zealand in the Antarctic.

"The project was a challenge be-

HILLARY FIELD CENTRE

The 1,800 sqm, two storey structure with goods lift will provide for:

- Receipt, storage and issue of bulk stores. There will be provisions for cool stores and frozen stores including a low temperature freezer for scientific samples.
- Storage, maintenance, issue and receipt of field support equipment such as tents, sleeping bags, cooking equipment, climbing gear, etc.
- Marshalling areas to consolidate and temporarily store field events' equipment and materials prior to deployment to the field.
- Testing of science equipment and support gear.
- Assembly of science cargo including packaging supplies and equipment for transport into the field.
- Washing down and drying tents/field gear and diving equipment.
- Field training lecture facilities.
- Administrative offices for field trainers and cargo handlers.
- A fitness centre.
- Processing of field generated ablutions waste.

cause of the extreme environment, but we are very pleased with the way it has rolled out to date.

The key to our success was ensuring that every piece of equipment and all tools, machinery and pre-cast construction components, were delivered to Antarctica in exactly the right order."

"This required incredible logistical

Continued to Page 71



Cape Hallett camp site for university team.

LGP Continues at Cape Hallett

A team of four returned to Cape Hallett in early November to unpack the cache of gear left at the site over winter and set up the camp for another season of Latitudinal Gradients Project (LGP) research.

This year the camp is trialing an alternative energy system developed by Dave Hume from Canterbury University's Department of Electrical Engineering.

By day five of camp set up, a wind generator on a 10 metre mast and two solar panels were providing power to the camp that otherwise would have been supplied by generators.

The first group of scientists arrived at Cape Hallett on November 11th for four weeks to study sea ice algae, marine larvae and terrestrial mosses and lichens.

The LGP camp will be home over the Christmas and New Year period to a group from Antarctica New Zealand continuing the clean-up work of the old Hallett Station.



Wind generator unit atop the 10 metre mast.

Return to Scott Base for Sir Ed

Sir Edmund Hillary returned to Antarctica in November, almost half a century after leading the New Zealand expedition that established Scott Base.

Sir Edmund, accompanied by the Minister of Foreign Affairs Phil Goff, spent eight days on the Ice and features in a television documentary focused on the 50th anniversary of Scott Base, which is in 2007.

Welcoming Sir Edmund back to the base he established in 1957, Antarctica New Zealand CEO Lou Sanson said, "Sir Edmund is synonymous with New Zealand's Antarctic endeavours. He chose the original base site for its magnificent views and he established our modern day Antarctic science programme, which has made such a contribution internationally."

Filming a documentary simultaneously is also a chance to record major milestones in the history of Scott Base and Sir Edmund's connection to those.

"His return to Scott Base is a great thrill for staff and scientists alike and it's a humbling experience for me personally. My own father wintered-over in 1964, only six years after Hillary was first here."

Sir Edmund's visit coincided with the 25th anniversary of the Mt Erebus air crash that claimed the lives of 257 people in Antarctica on 28 November 1979. A commemorative church service was held at Scott Base at which Sir Edmund read a Bill Manhire poem "Erebus Voices" written specially for the occasion. (See Erebus Tragedy Remembered on page 66).

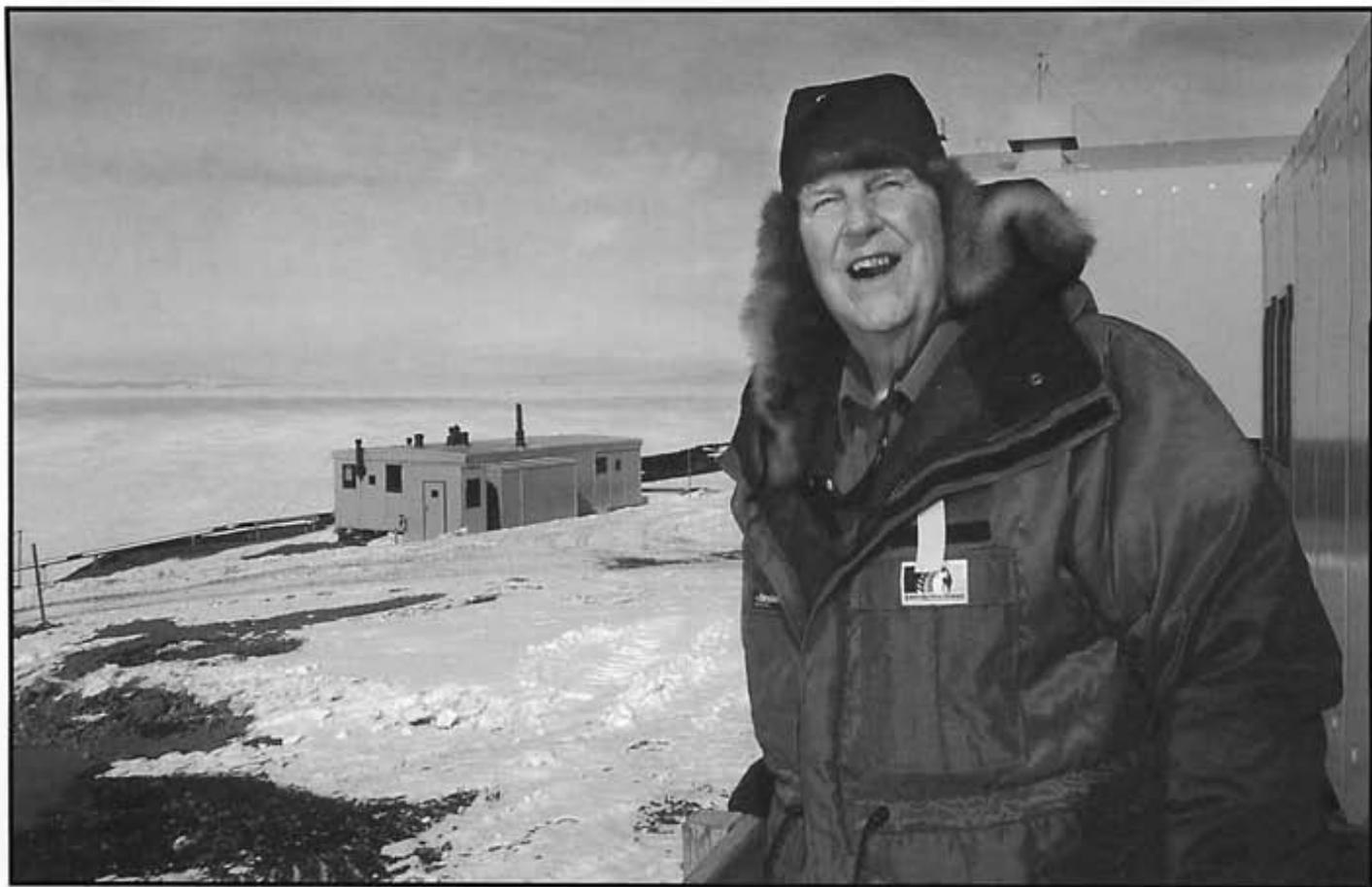
Sir Edmund spent a day visiting the historic huts at Cape Evans and Cape Royds in his capacity as patron of the Antarctic Heritage Trust, who are working to save the legacy of early Antarctic explorers Scott and Shackleton.

A dinner followed in the Trans-Antarctic Expedition (TAE/IGY) hut, the first building erected at Scott Base by Sir Ed and other members of the TAE expedition.

Another highlight was an evening lecture at the nearby McMurdo Station.

"Hillary and the Americans have a connection dating back to the South Pole and Admiral Dufek." Sanson said.

While in Antarctica, Sir Edmund also named the Hillary Field Centre, the single largest construction project ever undertaken at Scott Base. (See Sir Ed Hillary names New Scott Base Building on page 68).



Sir Ed with the only remaining building from when Scott Base was built in 1957.

Sir Ed outspoken on 'Polar road'

By Tim Pankhurst
Editor of The Dominion Post

Sir Edmund Hillary, who drove every one of the 2011 kms from Scott Base to the South Pole on a tractor, is appalled the United States is building a road across Antarctica.

The world's greatest living explorer is in the twilight of his long and distinguished life but is still an imposing and passionate man.

"I think it's terrible," he says of the project now half-way towards its objective.

"I'm very strongly opposed to it. I think they ought to continue using their aircraft as they have done for years and years.

I have to admit I don't wish them well in their success in getting up and through the polar plateau.

It's about destroying the journey to the Pole in using huge vehicles to plunge through the snow and ice and

crevasses to get there." The ambitious project is in its third season. The directions are simple.

Head east from McMurdo Base, angle across the Ross Ice Shelf, head up the Leverett Glacier and drive due south to the Pole.

The reality is that the 1600 kms journey is across the highest, coldest, driest and windiest continent in the world.

Already tonnes of dynamite have been used to blow up crevasses and fill them up with mined snow.

The aim is to markedly reduce the number of polar flights, due to reach an all-time high this summer of 333.

Antarctica New Zealand chief executive Lou Sanson, supported the project, which was discussed at The Antarctic Treaty Consultative Meeting in Cape Town in June 2004.

The American's submitted a CEE (Comprehensive Environmental Evaluation) on the project which ad-

ressed and recognised the routes impact on wilderness values, noting that reduced flights to the South Pole would reduce overall environmental impacts of the US Antarctic Programme.

Sir Ed, never one to hide his views and exert his formidable will, is unconvinced. He does owe the American a debt in other ways though.

The Scott Base site at Pram Point on Ross Island was proposed by the US, and they provided a bulldozer to prepare the site.

It was from here that the 1957 Trans-Antarctic Expedition was launched. New Zealand makes its claim for a slice of Antarctica from here.

In 1956-57, and into the summer of 1957-58, hunkered down at the newly built base, Sir Ed's 23-strong party supported the International

Continued to page 73

Renewable energy at Mawson Station

The Australian Antarctic Division (AAD) received a grant of half a million Australian dollars from the Australian Greenhouse Office to demonstrate the use of hydrogen generated by wind in Antarctica.

The demonstration project at the remote Mawson site will research the safety and operational aspects of using hydrogen on station, as well as its viability as a major energy carrier.

Hydrogen will be generated using energy from the wind turbines, will then be stored and used in a test fuel cell, as fuel in a heater and in one of the station vehicles.

The two Enercon wind turbines, capable of withstanding blizzards in excess of 300 km/h, can provide one MW of electricity for use at the research station and for the hydrogen project — and dramatically lower the need for imported diesel fuel.

"The Mawson system will generate well over ten times the power of



Photo by K. Barrett, Australian Antarctic Division.

existing Antarctic wind-power systems while having a much lower environmental impact than the current option of diesel fuel now used throughout Antarctica," said Australia's Environment Minister Robert Hill, regarding the wind turbine construction. When the system is fully developed, an Antarctic station will, for the first time, be able to use a renewable source to meet virtually all its energy needs."

For the upcoming hydrogen demonstration project, the AAD plans to install the test fuel cell and heater at the field camp on Bechervaise Island.

They will provide electricity and heat for the scientists involved in the penguin monitoring program.

By the completion of the project, the staff at AAD expects to gain sufficient information to be able to model the large-scale use of hydrogen to supplement their energy requirements.

The AAD expects that the use of hydrogen as a fuel will reduce the need for fossil fuels during those times when the wind energy is insufficient to power the station.

The hydrogen will fuel either a large-scale fuel cell system or an internal combustion engine generator.

The ultimate aim is to be able to run the station and all the field camps without the use of any fossil fuels.

ANTARCTICA NZ

Sir Ed Hillary names New Scott Base Building

Continued from Page 68

precision and planning both in New Zealand and on the ice. This meant the men could focus their attention on getting the work done as seamlessly and safely as possible."

Sanson also praised the considerable effort made by the Leighs Construction team in getting the bulk of the building constructed in time for the official opening by Sir Edmund.

The building was designed by Opus International Consultants.

Two-storey structure is located 1200mm above grade on steel posts. This arrangement permits the snow to blow clear underneath the facility and prevents heat from the building affecting the underlying permafrost.

Lightweight steel framing is over clad with a 250mm thick polystyrene

cool-store panel manufactured by Bondor New Zealand Ltd, in Christchurch.

Electrical power is provided by the existing Scott Base energy centre. Heating supplied by diesel-fired boilers located within the field centre.

High efficiency fluorescent lighting is used throughout the facility with motion detector controls to minimise electrical power consumption.

There is provision to install heat recovery in the air extract system at a future date when actual operating characteristics have been confirmed.

Materials were delivered to Scott Base and foundations completed in February 2004, and the 2005 winter-over crew will be working to fitout the interior.

This project necessitated the single largest shipping requirement ever undertaken for the programme in

conjunction with the United States Antarctic Programme.

Shell construction took place between October 2004 and February 2005.

The interior fit-out by Antarctica New Zealand staff has a completion target of August 2005, in time for WINFLY.

Commissioning and occupancy will take place in August – October 2005.

This includes the shifting of stores from other buildings and containers into the field centre.

Once the new building is operating, a demolition programme will commence to remove a number of old storage facilities around the base making the base much more energy efficient.

David E. Yelverton

By David L. Harrowfield

David Yelverton was a tank regiment veteran of World War II who, had managed transport during the laying of the new 16" oil pipeline from Iraq to Syria in 1946-47. He returned to the UK and his subsequent career in the chemical industry-managing engineering, planning and logistics. He led the way in the application of cutting-edge computer systems through to retirement in 1979.

In 1982, when Antarctic Curator at Canterbury Museum, I received an intriguing letter. It was from David Yelverton of New Milton, Hampshire, UK.

By now, in 1982, David had resolved key anomalies in "The White Ribbon", the then 'bible' for Polar Medal collectors. In his letter he was seeking details of Polar Medals in the Canterbury Museum collection. Of interest were variations and mistakes in naming, and of un-gazetted medals, these described a year later in his important paper, "The Bronzes That Never Were".

At this time, Richard McElrea and I were researching the Ross Sea party (1914-17) of Sir Ernest Shackleton's Imperial Trans-Antarctic Expedition. As a result of locating a rare OBE awarded to Captain J.R. Stenhouse of the *Aurora*, David learned of a tin trunk containing Stenhouse's diaries, logs and other important archives. In one of the coldest winters in recent years and with his feet on a hot water bottle, David carefully catalogued the collection subsequently made available, courtesy of Mrs Patricia Mantell (Captain Stenhouse's daughter), for the Ross Sea party research.

With the formation of the Antarctic Heritage Trust in 1987, David immediately showed his support by presenting a framed montage of photographs mostly taken by himself, illustrating Shackleton's medals and other awards. This was presented at the of-



Margaret Bradshaw and David E. Yelverton.
Photo by John Bradshaw.



David E. Yelverton at Scott Polar Research Institute (SPRI).
Photo by David Harrowfield.

ficial launch of the Trust in Christchurch on 26 February 1978. He was the only person to have photographed all of Scott's gold medals and a similar montage is occasionally on display at Discovery Point, Dundee, where his long campaign to have the original cabin occupants indicated by the name plaques on the doors has at last born fruit.

In 1986 David was elected a Fellow of the Royal Geographic Society and he was soon providing invaluable assistance to the society's documentary and photo archives. Already highly concerned at the publication in 1979, of Roland Huntford's controversial work "Scott and Amundsen", he prepared to set the record straight. This led to 15 years meticulous research which culminated with the publication in 2000 of the definitive work: "Antarctica Unveiled" reviewed by Baden

Norris in *Antarctic* (Vol.19 No.2. 2001). However David's efforts did not cease here. In December 1996 he had already published in *Antarctic* his first article on the multi-national exploration of the Antarctic Peninsula at the start of last century. This described the saga of the Belgian Antarctic Expedition 1897-99 and was followed by a further 11 articles, bringing together the multiple accounts and log of William Bruce's Scottish National Antarctic Expedition 1902-04, as well as accounts (then never translated into English) by participants in the British, Swedish and French expeditions. The latter three were published in his last book "Quest for a Phantom Strait". His most recent article was "Shackleton's First Sledge Journey" (*Antarctic* Vol.22 No.1. 2004).

Also a member of the Captain Scott Society (Cardiff); the James Caird Society (Dulwich); Friends of the Scott Polar Research Institute (Cambridge) and of the UK and NZ Antarctic Heritage Trusts, David was highly respected by the international polar community and well known in the UK for his informative lectures. He was always pleased to share his wide knowledge on the exploration of the polar regions.

Although having done some high alpine walking and long interested in the Arctic and Antarctic, he never visited Antarctica. However he enjoyed a regular association and correspondence with polar colleagues, and his award of a Life Membership to the New Zealand Antarctic Society was richly deserved and a fitting culmination to his work.

His publications will be a lasting legacy and it is hoped that his wish for greater appreciation in the UK of Britain's early polar heritage will gain momentum.

David died in Hitchin, Hertfordshire, England on 20 November 2004.

Life Membership

Letter of 20 October 2004 from David Yelverton to John Parsloe, as the Antarctic Society's then head office co-ordinator. Mr Yelverton died one month later. See 'Tribute' on Page 72.

Dear John,

Life Membership

Just a line or two to record for the Society's files safe receipt of the handsome Life Member's lapel badge which you sent with your kind 11 October letter, and respond immediately to your request for some biographical detail for the note you have been asked to write about me for the journal. I hope the attached draft biographical note will help with that task. Please alter or shorten it as you find necessary.

My response to the President's letter will take care of recording in hard copy my deep appreciation of the great honour the Society has bestowed on me, but I want this short letter to tell you what an enormous pleasure it has been to work with you and Margaret Bradshaw these past eleven years for the causes the Society has so ably pursued under her and your stewardship. I only wish I could have done more and enjoyed the better health that would have allowed me to visit New Zealand and Scott Base, had I had my way.

I am e-mailing today an advance copy of this and the biographical note, plus a scan of the photo I mentioned taken by John Bradshaw of Margaret and me in my study (with which you are so familiar), which I hope will come out well enough your end to reproduce well in the journal.

With all best wishes,
David Yelverton

NEW STAFF



Antarctica New Zealand welcomed Janelle Masson in the role of Accounts Assistant within the Corporate Services Team.

Janelle has 3 years experience in a variety of logistics based organisations.

Her outside interests include Motorsport, Skiing, and Walking.

Janelle will assist the accountant with day-to-day financial operations including working on a variety of projects as part of the implementation of Antarctica New Zealand's Information Management System.

*Sir Ed outspoken on Polar road
Continued from Page 70*

Geophysical Year with scientific observations; dog sledged hundreds of kilometres; surveyed the Dry Valleys for the first time and charted vast areas.

His role was to drive food and fuel depots 1126 miles toward the Pole and await Sir Vivian (Bunny) Fuchs who was crossing the continent from the Weddell Sea.

"We would have had to sit there and wait for possibly a month for Bunny to arrive and I simply wasn't prepared to do that."

On Boxing Day 1957, he radioed Scott Base: "We are heading hell-

bent for the Pole, God willing and crevasses permitting". He thus became only the third man to travel overland to the Pole, after Amundsen in 1911 and Scott in 1912.

Reminiscing in the green mess hut where it all began, the only original building left at the base, Sir Ed laughed that he was rather prone to dramatic statements.

His winter in the hut was no hardship, there was plenty of fresh lamb in a snow cave, no shortage of wine and parties every Sunday night.

"There was always laughter and cheerfulness – we had a very happy and convivial time.

Sometimes the party would become too boisterous "and the picture

of me emerging in my underwear full of fury at all the noise was something to behold."

At the 25th anniversary remembrance service at Scott Base, Sir Ed recalled that he was to be on board the fatal flight, as commentator, but was called away on business in the US.

His close friend, climbing and polar companion, Peter Mulgrew took his place.

Reprinted courtesy of The Dominion Post.

Scientific Fishing yields huge catch



By Kristan Hutchison

Scientists aren't telling tales of ones that got away during their two-month fishing trip in the Southern Ocean. They're satisfied with the 9,900 fish they caught.

"I think everybody accomplished much more than they thought would be possible," said chief scientist Bill Detrich, who first proposed the International Collaborative Expedition to collect and study Fish Indigenous to Sub-antarctic Habitats (ICEFISH) eight years ago.

It was the first science cruise of that size dedicated primarily to fishing, said Detrich. The cruise on the research vessel *Nathaniel B. Palmer* (NBP) involved 31 researchers, including 8 graduate students, from the U.S., U.K., New Zealand, Italy, France, Germany, South Africa and Australia. Using trawls, traps, beach seines and ordinary fishing poles, they hauled up enough fish to fill their lab freezers. They collected samples, including a few previously unknown species, and data for 21 research projects.

"There's enough stuff to last for years and years and years," said fish biologist Joe Eastman, who sent three drums packed with more than 100

gallons of fish and two boxes of preserved tissue to Ohio University.

The NBP left Punta Arenas, Chile, on May 17 and arrived in Cape Town, South Africa on July 17, stopping at seldom-visited subantarctic islands along the way to drop a line or net. The cruise went through the Falkland, South

Georgia and South Sandwich islands, to the isolated Bouvet Island and then north to Tristan da Cunha.

"This was really going to be a one-time shot, and that means we had to cover all the islands and get it done," said Detrich, a professor of marine biology and biochemistry at Northeastern University in Boston.

The purpose of the cruise was to relate the evolution, physiology, biochemistry and population dynamics of Antarctic fish to their more temperate cousins in the subantarctic. The results could help researchers understand the evolutionary impacts of global climate change, loss of biological diversity and depletion of fish stocks.

"We got just about every single species we wanted," Eastman said. "We didn't get huge numbers of some of them, but we got some and the ones we really wanted we got in large numbers."

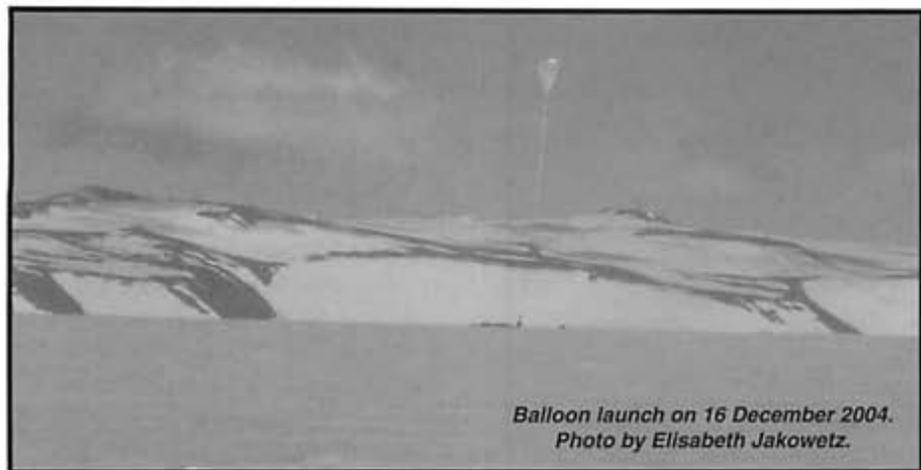
Reprinted courtesy of the Antarctic Sun.

Top: The research vessel Nathaniel B. Palmer. Photo by Al Hickey, US NSF. Photo taken near Ross Island.

Below: Scientists from the ICEFISH project fishing in Tristanda Cunha. Photo by Daniel Doolittle, courtesy of the Antarctic Sun.



Balloons in Hunt for Cosmic Rays



Balloon launch on 16 December 2004.
Photo by Elisabeth Jakowetz.

By Karl Horeis
Special for The Antarctic Sun

Sending up world-class scientific instruments on thin balloons isn't a simple task.

On December 16, 2004, the National Scientific Balloon Facility (NSBF) crew from Texas, launched two payloads on a Long Duration Balloon, the Balloonborne Experiment with a Superconducting Spectrometer (BESS) and Cosmic Ray Energetics and Mass (CREAM).

The Long Duration Balloons are made of ultra-thin polyethylene film but are designed to be stronger than the same type of material used for plastic sandwich bags. At only 0.002cm thick, the balloons must be handled carefully from production to launch. At the factory, the film is cut into banana-peel shaped sections called gores and heatsealed together to form the balloon. As many as 180 gores are used to make the largest balloons. The balloons are called zero-pressure balloons because the bottoms remain open, which allow them to equalize to the pressure surrounding it.

The CREAM payload will serve as the first test of the payload designed to capture hydrogen, helium and other heavy extra-solar nuclei which travel across the galaxy at the speed of light. The data acquired dur-

ing the flight may lead to a better understanding of how supernovae accelerate the particles and how those particles traverse our galaxy. The particles possess energies far beyond anything that ground based particle accelerators can produce and can only be seen high above Earth's atmosphere. Scientists are learning more about the composition of cosmic rays, but need much more data on the highest energy particles.

CREAM was originally designed for use with an Ultra Long Duration Balloon (ULDB), which can carry an instrument for up to 100 days. However the ULDB balloon is in testing. Primary investigator Eun-Suk Seo, a professor at the University of Maryland, said her team is working to develop international collaborations to design and build a duplicate version of CREAM to allow LDB flights every year to attempt to gather as much data as possible to make up for the lack of ULDB time.

CREAM has been refined thanks to previous Antarctic flights. data acquired during the flight may lead to a better understanding of how supernovae accelerate the particles and how those particles traverse our galaxy. The particles possess energies far beyond anything that ground-based particle accelerators can produce and can only be seen high above Earth's atmosphere.

LONG DURATION BALLOONS FACTS

Constructed of: polyethylene film
Length: Up to 243m (taller than the Washington Monument)
Volume at altitude: 1.1 million cubic metres
Diameter: 120m
Thickness: .002cm
Similar to: sandwich bag material
Max payload weight: 3,600kg, including instrument, parachute, solar array and assorted electronic flight gear and cabling.
Time from launch to max altitude: 2 hours
Max altitude at flight: 42km
Max duration: Up to 30 days
Antarctic duration record: 18 days (TIGER I)

Source: National Science Balloon Facility, <http://www.nsbfnasa.gov/>



A Long Duration Balloon takes off from the McMurdo Ice Shelf.
Photo by Brien Barnett, National Science Foundation.



Lou Sanson (Antarctica New Zealand CEO) on Finger Mountain.

Antarctica New Zealand faced another demanding year in respect to the 2003/2004 season with a record number of events occurring.

It was a very busy year for deployments with 370 people and 371,780 lbs of cargo taken to Antarctica.

There were a record 79 events (of these 39 were science events), and the organisation supported science and environmental initiatives as far away as 720 km from Scott Base.

Antarctica New Zealand's budget is a little over \$NZ9m annually. The institute's programme is supported by 27 permanent staff, rising to 60 (including New Zealand Defence Force personnel) over the summer season.

A total of 15 intercontinental flights were undertaken by the Royal New Zealand Air Force (RNZAF) in support of the institute's operations, in addition to those provided by the United States National Guard.

In addition to logistics, Antarctica New Zealand is responsible for discharging New Zealand's obligations under the Antarctic Treaty, including commitments under the Environmental Protocol.

The chairman of the Board of Antarctica New Zealand, Mr Paul Hargreaves, says the board focussed on a number of significant issues dur-

ing the year to June 2004, including:

- **Science Strategy:** A new science strategy has the objective of providing a framework and direction to New Zealand's investment in Antarctic science. This will be backed up by a review of the New Zealand science outcomes over the past 20 years.

- **Marine Strategy:** New Zealand's strategic interest in the Ross Sea and Southern Ocean and in particular its biodiversity, is explicitly recognised in the New Zealand Government's Statement of Strategic Interest in Antarctica. Appropriate logistics and science budget bids enable New Zealand to exercise this commitment.

- **International Polar Year:** Fifty years on from the International Geophysical Year (IGY 1957-58), will see the International Polar Year (IPY 2007-08). This is likely to trigger a new wave of scientific initiatives in Antarctica, in the same way that IGY did following the establishment of Scott Base and McMurdo Station.

Major new scientific initiatives are under consideration by the international Antarctic community in preparation for IPY. The most significant is a circum-Antarctic census of ma-

rine life (CircAntCML), promoted by Australia and supported by a number of other countries. This would allow a systematic recording of biodiversity in the waters around Antarctica through a co-ordinated programme of ocean observations. From New Zealand's point of view, the Ross Sea is a highly productive ecosystem and is considered one of the world's seas least modified by human impacts.

- **ANDRILL:** Antarctica New Zealand is project manager for this major international drilling programme on the McMurdo and Ross Ice Shelf involving the United States, Germany, Italy and New Zealand, designed to measure global environmental change. This follows on from the earlier Cape Roberts project and involves multi-site drilling. Specialist equipment will be brought on site in the 2005/2006 season. "This is a complex and demanding project that will stretch our resources to the limit," says Mr Hargreaves, "The board places great importance of its success."

- **Environment:** "We are very committed to showing leadership in different aspects of life in Antarctica. A major joint effort has been going into the clean up of the former United States/New Zealand Station at Cape Hallett. In addition, a project investigating improved methods of energy management for Scott Base and our field stations is being conducted with the assistance of the University of Canterbury."

- **External Relationships:** Close working relationships with the United States now stretching back 48 years are a strength of the Antarctic Research Programme. "We were delighted by the decision of the Christchurch City Council to recognise the value of the US relationship in their decision to host the 2004/2005 season opening event and to follow up with plans to host an Antarctic festival.

"Our relationship with our other neighbour, Italy, located at Mario Zucchelli Station at Terra Nova Bay, is also greatly valued. We have established a more active relationship with our Australian neighbours in the past

year and are proposing a number of new shared science initiatives with the Australian Antarctic Division in Hobart."

• **Scott Base:** The 2004/2005 summer saw the assembly of the largest building at Scott Base, the new Hillary Field Centre, which will fill a long awaited deficiency. At \$NZ4.3m, this the largest single capital project New Zealand has yet committed to on the Ice.

HIGHLIGHTS

The chief executive of Antarctica New Zealand, Mr Lou Sanson, says two real highlights in the 2003/04 season were the Latitudinal Gradient Project and the Cape Hallett clean-up.

"After more than four years planning, the Latitudinal Gradient Project (LPG) was finally set up for over two months at Cape Hallett – the largest deep field camp ever supported by Antarctica New Zealand.

"Over the next decade, the project will study five sites along the Victoria Land coast in order to increase our understanding marine and terrestrial ecosystems, and help predict climate change patterns.

"The LGP campsite also provided an opportunity for New Zealand and the United States to clean up the former station at Cape Hallett. The New Zealand team ably assisted by the New Zealand Defence Force, dismantled and packed up a staggering 22 tonnes of debris for removal in the 2004/2005 season. (See story on page 69).

The site surveys for ANDRILL continued in earnest on the McMurdo Ice Shelf as did new work on ice-coring, diving programmes, ice-shelf stability and geological survey. Last season also saw a large scale marine research effort with NIWA's *RV Tangaroa* and the *RV Italica*, which strengthened the relationship with Italy on marine science programmes

in the Ross Sea.

A major environmental success was the acceptance by the Antarctic Treaty Consultative Meeting in Cape Town of the Dry Valley's Management Plan. This major milestone is a testament to effective international collaboration and represents many years work between the United States and New Zealand, and our respective scientific communities.

The environmental team has also been active in developing Antarctic-wide State of the Environment Reporting. Antarctica New Zealand remained active on international science at conferences, plenary sessions and Treaty meetings through the leadership of the Ministry of Foreign Affairs and Trade's Antarctic Policy Unit.

A particular highlight was the Antarctic Treaty Meeting of Experts which looked at the future impact of tourism in Antarctica and led to the adoption of measures concerning the future management of adventure tourism and activity in Antarctica.

"Back home, we continued to support New Zealand's best possible science and research through our new Antarctic Science Strategy," says Lou.

In May 2004, the worst storm in 12 years hit Scott Base, with winds reaching a maximum gust of 180 km/hr. The base and some outlying structures sustained damage as did some vehicles. (See *Antarctic Journal* Vol.22 No.2, 2004)

Winds blew over containers and blasted the hangar door in. Due to the loss of the hangar door, the first task was to clear all the snow that had accumulated within the hangar. This work took the winter-over staff nearly two weeks in -20 degrees C temperatures and darkness, clearing snow from every shell and corner of the container, some of it up to 6 ft in depth.

Information compiled from the Antarctica New Zealand Annual Report 2003/04.



The combination of science, people and the stunning environment is what makes research in Antarctica such a special experience.

John Cockrem, Scientist.

Kiwis are thriving in isolation

By Tim Pankhurst
Editor of The Dominion Post

Isolation in Antarctica is stressful and does strange things to people. That is the common theory – the reality is that Kiwis at Scott Base are thriving.

There is often a dip in mood about halfway through the posting, no matter its length, according to psychologist Dr Gary Steel.

"When they arrive here they are in a pretty happy mood," he says. "What happens is they drop down to normal – they go from really happy to content."

They keep coming back. About 30% have been before. Like chef Jeff Reid, of Napier, who has wintered over twice, and at the time of writing this article is in his third summer.

"You're not locked up", he says. "I don't feel any isolation problems. You can pick up the phone any time or use the Internet.

"In some ways it's good. There's no traffic."

"Some people find it stressful that they can't go to the shop and get a new pair of shoes. I don't seem to have that problem."

His main gripe is getting sick of the same CDs.

Jeff the chef, who doubles as fire chief, also shares his eclectic record collection with the Scott Base population.

He bought a bulk lot from the City Mission in Christchurch and until the record player stylus gave out he amused the base with obscure titles played loud at breakfast in the kitchen.

They included artists that were an acquired taste even when current, such as Roger Whittaker, Kamahl, the Continental Airlines Auckland Brass and Nana Mouskouri.

Dr Steel's work on human adaptation in extreme and unusual environments is complemented by studies by clinical psychologist Dr Tim Williams, senior counsellor at the Christchurch College of Education.

The pair have been interviewing base staff about their moods and attitudes and sleep patterns.

Dr Williams has previously worked with health professionals and sports referees examining ethical decision-making.

His work pertains to the way scientists, base staff and tourist operators make decisions in a vulnerable environment. Dr Steel, senior lecturer in social psychology at Lincoln University, has worked with astronauts and submariners.

He has found the type of people who come to isolated outposts such as Antarctica are less neurotic, less vulnerable to stress, slightly more extrovert, more agreeable, conscientious and open to experiences than the average person.

"They are faced with challenges you don't get elsewhere. They are certainly interesting people."

It is rare for them not to cope.



Psychologists Gary Steel, left, and Tim Williams have been interviewing base staff to find out what sort of people adapt well to unusual and extreme environments.



Chef Jeff Reid of Napier, who doubles as the fire chief, makes buns for morning tea in the kitchen.

"If anything was noticed it would be withdrawal," Dr Steel says. "Living in Antarctica appears to be good for you," Dr Williams adds. "A definitive study done on US personnel showed those who came down had lower death rates and illness upon their return."

Dr Williams has also noted that the Scott Base culture has changed markedly.

The "professional isolates" of the 1970s and hairy men of the 1980s have been replaced by a more representative group, including a lot more women. There is less military presence, and the support personnel who winter over are more involved in field support.

Some pursue special projects in the long dark winter such as writing, playing instruments and metal working. One plans to build a full sized "Dalek" that would fool Dr Who.

Jeff, the chef, is working on a candelabra and writing a cookbook.

Reprinted courtesy of The Dominion Post.

Three winning designs are chosen for a new British research station

Three winning concept designs for a new research station in Antarctica were announced on 24 November, at the Halley VI Design Exhibition at the Royal Institute of British Architects (RIBA). The designs were called for to replace the current British station, Halley V Research Station (See story in *Antarctic*, vol 22, no 2, 2004).

The new complex, will be located on the Brunt Ice Shelf, which is 150m thick and flows at a rate of 0.4 km per year northwest from Coats Land towards the sea, where, at irregular intervals, it calves off as vast icebergs.

There is a growing risk that ice on which the existing Halley Research Station sits could break off in the next decade.

The new station will allow long-running research on global change to continue at the site where the ozone hole was discovered.

From six short-listed teams, a jury panel selected three winning designs for the new Halley VI Research Station.

British Antarctic Survey Director and Chair of the Jury Panel, Professor Chris Rapley CBE, announced the winning teams as: Buro Happold and Lifschutz Davidson; FaberMaunsell and Hugh Broughton Architects; Hopkins Architects and Expedition Engineers. He says, "It was an extremely difficult decision for the panel to choose three teams as all six concept designs showed tremendous ingenuity meeting our requirements.

The three winners demonstrate real innovation in their approach to the Halley VI Research Station, which must be functionally efficient yet an aesthetically stimulating place to work."

The panel selected Buro Happold and Lifschutz Davidson for their concept of linked space-station-like structures on jackable legs. They



Photo of the original base at Halley Bay, established for the International Geophysical Year (IGY). This base was closed in 1968.

Photo by British Antarctic Survey.

were impressed by the thought given to the living space and how staff would have quiet, private areas as well as community space.

The architectural features are complemented by comprehensive engineering, which offers a practical solution to living and working.

Special attention has been given to construction, maintenance, dealing with the annual build up of snow, and how the station can be relocated - overall, a concept that can be developed into a practical and cost effective research station.

Engineers FaberMaunsell and Hugh Broughton Architects were selected for a strong architectural design. The modular approach enables units to be linked together to form a station that can accommodate user requirements and be easily relocated. The depth of thought given to the construction phase particularly impressed the panel.

Hopkins Architects and Expedition Engineers "walking building" demonstrated an innovative approach to relocating the structures.

The panel reflected on the challenges to be overcome in realising the design, but considered the overall concept to be achievable.

The team has taken care in matching the sustainability requirements



The Laws Building at the current Halley Bay station, commissioned in 1992.

Photo by the British Antarctic Survey.

outlined in user documents and how new materials can be introduced to Antarctica.

The three teams have a further ten months to develop their ideas. A winning design will be announced in September 2005.

1 December 2004

Dear Editor,

As usual I very much enjoy receiving Antarctic and look forward to each issue. However I wish to point out that the nice frontispiece in Volume 22, No 3, features supplies not in Scott's hut at Cape Evans, but those in venesta boxes nailed to a south wall in Shackleton's hut at Cape Royds. Certainly a minor point, but one, which I feel, should be corrected.

Yours sincerely,
David L. Harrowfield

Antarctic Marine Protists

Edited by Fiona Scott and Harvey Marchant

Published by: The Australian Biological Resources Study in conjunction with the Australian Antarctic Division, 2004

ISBN 0642 568359

Protists are microscopic algae and protozoa, formerly thought of as single-celled plants and animals.

Planktonic protists constitute the base of marine food webs and play a key role in global ocean-atmospheric gas exchange.

This book is a comprehensive guide to the protists that live in the surface waters and sea-ice around Antarctica. More than 550 organisms are described and superbly illustrated with over 1300 light and electron micrographs and drawings.

The inclusion of an extensive bibliography of the widely scattered literature makes Antarctic Marine Protists an indis-

pensable resource for marine biologists.

This book retails for AUD \$95.00 and is available via an order form on the Australian Antarctic Division web page at www.aad.gov.au.



Dear Editor,

I read with interest the article about Harry McNish by Andrew Leachman, particularly McNish's companionship with Thomas McLeod.

However, I would like to point out that Thomas McLeod was not a Shetlander, he was a Hebridean. Thomas, son of a ship's carpenter, was born in Stornoway, Isle of Lewis in 1869. I understand he often assisted McNish with carpentry jobs.

It is also debatable whether McLeod served on the Nimrod. Although it is written in a number of books/articles about the Endurance expedition that McLeod had previous Antarctic experience on the Nimrod, McLeod's name does not appear in the Nimrod crew list and McLeod himself, interviewed later in life in a Canadian newspaper states he was three times in the Antarctic: with Scott on the Terra Nova and with Shackleton on the Endurance and the Quest.

Little is written about McLeod, who died in Kingston, Ontario in 1960 aged 91, and I am endeavouring to find out more about him.

Margaret Macinnes
Isle of Lewis
Scotland

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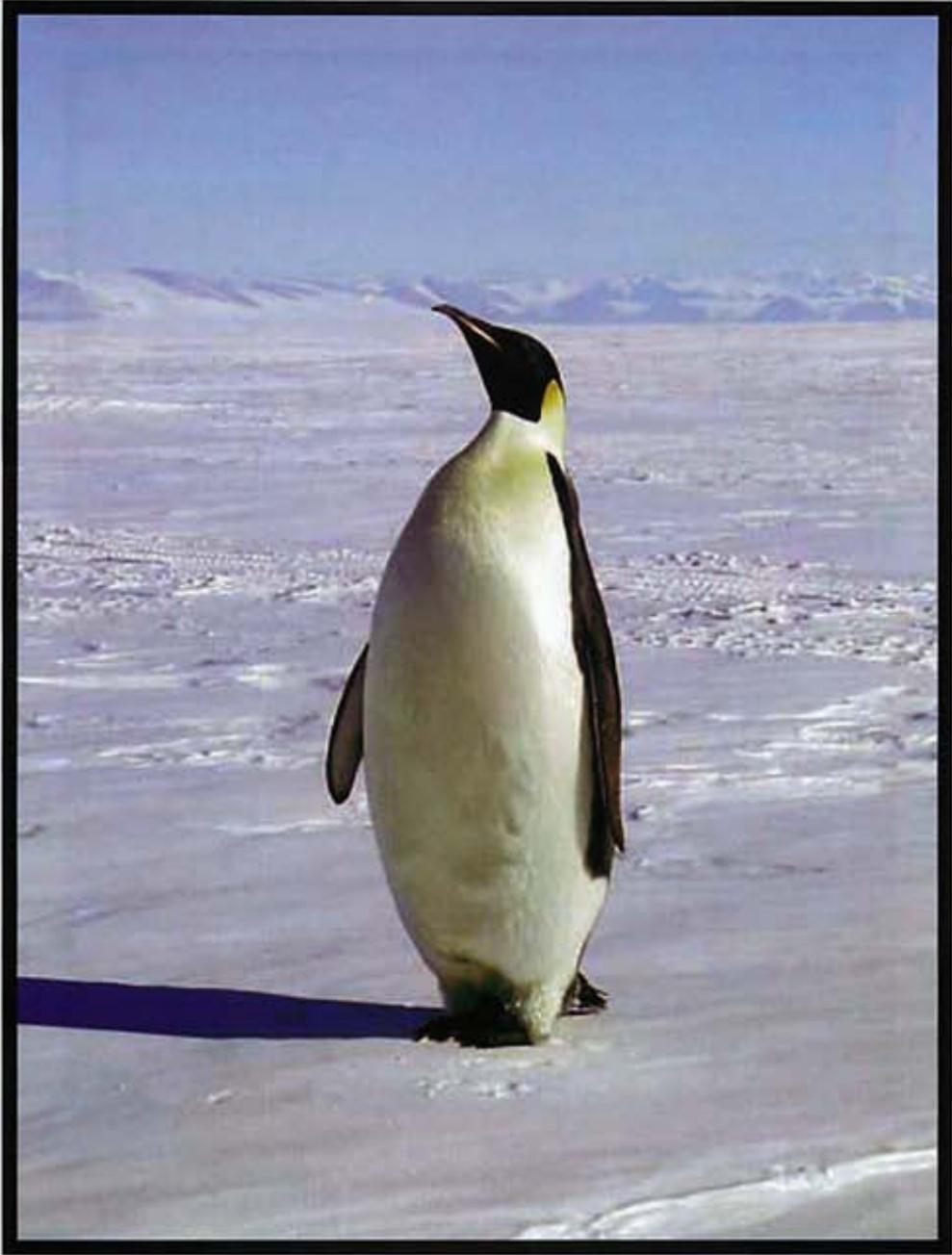
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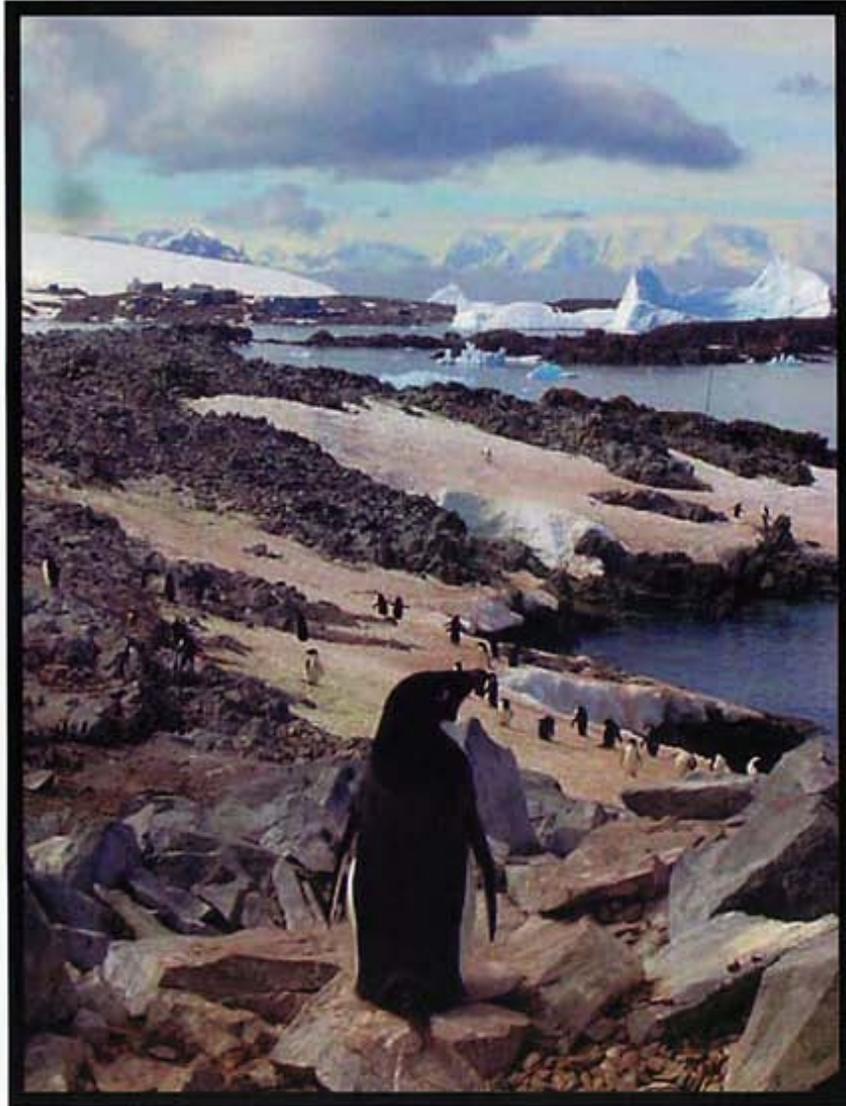
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Please post membership application to:
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*Emperor penguin on the sea ice of McMurdo Sound.
Photo by Beth Minneci, US National Science Foundation.*



A colony of Adelie Penguins on Humble Island near the Antarctic Peninsula. The buildings of Palmer Station can be seen in the background. Palmer Station sits on Anvers Island at 64° 46' S, 64° 03' W. Photo by Jeffrey Kietzmann, US National Science Foundation.