S.T. Lee Lecture in Antarctic Studies

This year’s S.T. Lee Lecture “Through a Crevasse Darkly: An Update on the Future of the Antarctic Ice Sheet”, presented by Richard Alley, Evan Pugh Professor of Geosciences, The Pennsylvania State University, was brought to us via live video-link. Richard has been particularly successful in advancing understanding of the behaviour of ice sheets, glaciers and ice shelves and is very candid about the many unknowns concerning global warming and its effects, earning him respect from those on both sides of the issue. His dynamic presentation highlighted many new discoveries that show that elements of Antarctic ice cover are surprisingly sensitive to warming and could accelerate sea-level rise. Yet, translating these new results into accurate projections for use by policy makers remains a major challenge.

Richard’s presentation was followed by questions from a panel consisting of Dr Nancy Bertler, Antarctic Research Centre; Prof Jonathan Boston, Institute of Policy Studies; Dr Andrew Mackintosh, School of Geography, Environment and Earth Sciences; and Prof Martin Manning, Climate Change Research Institute. Prof Peter Barrett, Antarctic Research Centre and Climate Change Research Institute chaired the session. The talk can be downloaded from our website at http://www.victoria.ac.nz/antarctic/about/lee-lecture2008.aspx.

A Job Well Done!

In January, MSc student Dhiresh Hansani, completed his thesis titled “Late Cenozoic Stratigraphy of the Southern Terror Rift, Antarctica: Implications for Tectonic and Climatic Evolution.” Dhiresh is now working in the gold mining industry in Western Australia, we wish him all the best.

At the end of May, Rob McKay submitted his PhD thesis titled “Late Cenozoic (130-My) glacimarine sedimentology, facies analysis, and sequence stratigraphy from the Western Ross Embayment, Antarctica: Implications for the variability of the West Antarctic Ice Sheet”, he remains at the ARC on a four month Research Assistant contract continuing research on ANDRILL.

A Celebration of the Achievements of Professor Peter Barrett

On the 26th March there was an official opening and unveiling of ARC meeting room – named the Beacon Room in honour of Prof Peter Barrett, the first Director of the Antarctic Research Centre from 1971-2007 in recognition of his work and discovery of the first tetrapod remains in the Beacon Supergroup, a succession of Devonian to Triassic (420-200 million years old) sedimentary strata that stretches the length of the Transantarctic Mountains. The following week, on the 2nd April, there was a celebration to formally mark the stepping-down of Peter as the ARC Director and to highlight his achievements during this time. The Vice-Chancellor, Prof Pat Walsh, opened the ceremony, and speeches were given by Prof Tim Naish, who has taken over the role of ARC Director and Alex Pyne, who told some interesting stories on Peter’s earlier adventures in Antarctica such as...

“This occasion would also not be complete without relating at least one Peter Barrett story. In December 1997 Peter was a member of a VUWAE group heading to Allan Hills, a remote area over 150 km away from Scott Base at the edge of helicopter range. Peter was responsible for bringing the First Aid Box, a plywood box about a foot cubed that was awkward to carry. Peter was obviously in a hurry carrying the box to the helicopter, was wearing mukluks which are like blankets tied to your feet, and the laces may have been undone. He slipped over on the icy ramp, landing on the hard edge of the box, but quickly picked himself up before anyone noticed, and got onto the helicopter to fly to Allan Hills. When Peter, Cliff Atkins and Vanessa Thom reached Allan Hills, Cliff noted that Peter was struggling to help unload the helicopter, so Peter fussed up that he had fallen over and was ‘slightly’ sore. Cliff and Peter shared a polar tent and for the next 3 days, in which Cliff learnt new life skills as a manservant, dressing Peter in the morning and removing his boots in the evening. Eventually the team with Peter’s reluctant agreement requested a medivac helicopter flight which picked up Peter and took him to the McMurdo Station Hospital where x-rays revealed cracked ribs and major bruising. Peter was told to take it easy and not exert himself, prescribed Voltarin and sent to Scott Base for rest, recreation and recovery. Apparently the next day he was spotted on the Scott Base Ski Field and managed six down hill runs of superhuman endurance. We suspect the drugs!”

A Word from the New Director

Although it seems like just yesterday since Peter and I switched offices, it is now going on six months that I’ve had my hand on the ARC tiller. For me it is great privilege to be given charge of Peter’s legacy and to lead the ARC forward. Peter’s leadership and the special qualities he brought to the job can never be emulated, and the ARC team have done well adjusting to the style of the new Director. Peter will remain as an active researcher in the ARC. He continues to manage the Centre’s endowments and relationship with the Victoria University Foundation, while also spending a third of his time working in the newly developed Climate Change Research Institute led by Prof Martin Manning.

The last six months have seen a number of exciting events, many are reported on in this IceSked. I just want to make brief mention of a few other highlights. Dr Brian Anderson has been appointed as a permanent Research Fellow in glacier modelling and Michelle Dow, the Centre Administrator, has also started in a new permanent position four days a week - welcome to both.

The ANDRILL McMurdo Ice Shelf science results are beginning to be published and are shedding new light on the past variability of the West Antarctic Ice Sheet.

Finally, I’d like to finish by saying, “Thank you Peter for your considerable contribution, you leave the ARC in good shape and I am honoured to lead the Centre forward with your continued support”.

Tim Naish

Looking Back: Photo from the Archives

ARC Weekend Retreat

From the 27-28th March, the staff and students of the Antarctic Research Centre headed off for a ‘retreat’ at Paraparauau Beach, on the Kapiti Coast. Apart from the strategic meeting discussing the future directions of the Centre, the retreat involved optional activities including kayaking, sailing, and fishing.

March Madness

March/April we celebrated the achievements of Prof Peter Barrett, as he stepped down as Director of the Antarctic Research Centre. We also report on the events of the past season in Antarctica, highlighting the achievements of the ANDRILL Southern McMurdo Sound project and other projects on the ice.

Peter’s Celebration Function, 2nd April 2008
ON THE ICE

ANDRILL Continues Remarkable Drilling Success

The Antarctic geological Drilling Program (ANDRILL) successfully completed the drilling phase of its second project in early December 2007. This new drillhole near western Ross Sea components and expands the results from ANDRILL’s first successful drilling season (see IceSked Issue 8) back in time to about 20 million years ago. Co-chief scientists David Harwood (USA) and Fabio Florindo (Italy) and the more than 60-strong science team of the Southern McMurdo Sound (SMS) Project are excited about the initial results that were recently presented during the post-drilling workshop at the Antarctic Core Facility, Florida State University, Tallahassee, in May. The 1138.54 m-long core of glaciomarine sediments was recovered from a floating sea-ice platform over 130 m of water in central southern McMurdo Sound. The sediments provide a remarkably well-dated history of oscillations in the size of the East Antarctic Ice Sheet (EAIS). The cores preserve a particularly detailed record from an interval of global warmth 17 to 14 million years ago when the coastal glaciers retreated back into the Transantarctic Mountains, and the interior EAIS may have been substantially smaller, through to a major cooling step between 14 and 13 million years ago when the ice sheet covered most of the continent. This interval of climate change is critical for understanding the contribution of wind blown dust to the sediments recovered in the drill core (see related article in this issue).

The drilling and engineering team coordinated through Antarctica New Zealand and supported by ARC’s Scientific Drilling Office was yet again able to go beyond target drilling depth and deliver excellent quality core with 98% recovery. ARC’s Alex Pyne assisted by Thomas Fokker overview the drilling operation on-ice and are justifiably proud of ANDRILL’s operational and technological achievements during the programmes first two drilling projects that include the two deepest drillholes on the Antarctic continent. Tim Nash

Glacier Accumulation in the Southern Alps

The objective of my PhD research is to better understand spatial and temporal controls on glacier accumulation in the Southern Alps of New Zealand, with a particular focus on the Tasman Glacier. At present we do not adequately understand how synoptic-scale climate variability influences snow accumulation in the Southern Alps, or how this snowfall is distributed in space and time. I have already conducted extensive field work, and have to date two seasons’ net accumulation data derived from crevasse stratigraphy a year of mass balance measurements along the glacier trunk and climate data from a weather station situated on the glacier surface. Working in collaboration with GNS Science and the University of Maine, USA, annual accumulation layers and age dating from the Tasman ice core will be used to extend my accumulation record back in time, and enhance investigations into the influence of atmospheric circulation patterns, on glacier accumulation. By including ice core data, such relationships might be considered on decadal timescales, greatly enhancing modelling and the ability to predict glacier behaviour with future climate change.

VUW ANDRILL staff send a message home

Glaciers during July/August. Yes, I am going to live in a high mountain hut for a month in the middle of winter on purpose! The data will assist in determining the present day signal of synoptic storm types in accumulated snow and will be compared to data derived from the Tasman ice core to see if longer term variations in climate can be determined. I am working on this project with my supervisors, Dr Andrew Mackintosh (SGEES) and Dr Brian Anderson (ARC), as well as Assoc Prof Wendy Lawson (University of Canterbury).
Perhaps more intriguing is the possibility that this dust is the source of the nutrient iron which stimulates vast algal blooms in the Southern Ocean. The Answer is Blowing in the Wind: Antarctica New Zealand and Victoria University of Wellington hosted a function at Rutherford House on the 27 May to celebrate the first successful drilling season (see IceSked Issue 8) back in early December 2007. This new drillhole in the western Ross Sea components and expands the results from ANDRILL’s first successful drilling season (see IceSked Issue 8) back in time to about 20 million years ago. Co-chief scientists David Harwood (USA) and Fabio Florindo (Italy) and the more than 60-strong science team of the Southern McMurdo Sound (SMS) Project are excited about the initial results that were recently presented during the post-drilling workshop at the Antarctic Core Facility, Florida State University, Tallahassee, in May. The 1318.54 m-long core of glacial marine sediments was recovered from a floating sea-ice platform over 1380 m of water in central southern McMurdo Sound. The sediments provide a remarkably well-dated history of oscillations in the size of the East Antarctic Ice Sheet (EAIS). The cores preserve a particularly detailed record from an interval of global warmth 17 to 14 million years ago when the coastal glaciers retreated back into the Transantarctic Mountains, and the interior EAIS may have been substantially smaller, through to a major cooling step between 14 and 13 million years ago when the EAWS cooled and expanded to roughly its present configuration.

As for the predecessor McMurdo Ice Shelf Project, a science team of about 35 from New Zealand, USA, Germany and Italy participated on-ice, where they worked in the Cravy Laboratory, McMurdo Station, doing the initial characterisation and description of the cores. ARC on-ice researchers included Cliff Atkins, Gavin Dunbar and Mike Hannah. The warm Miocene interval of the core is yielding a bonanza of undescribed marine diatoms for Mike and his team to work on, that together with a pollen record of beech forest vegetation suggests a substantially warmer climate perhaps akin to southern Chile today. Gavin will continue his work with Joel Baker’s mass spectrometry facility at VUW, to reconstruct past sea-surface temperatures using geochemical techniques. Cliff is working on the contribution of wind blown dust to the sediments recovered in the drill core (see related article in this issue).

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Extract from Alex Pyne’s speech

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