



## Antarctic Science Bursary Award 2007 - Initial Report

Dr.

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### *Terminal Cretaceous climate change and biotic response in Antarctica: Research visit (Wyoming) and ISAES conference (California), Aug - Sep 2007*

#### 1. 10<sup>th</sup> ISAES (International Symposium on Antarctic Earth Science), Santa Barbara, Aug 26–31

The conference was organised into four concurrent oral sessions occurring over five days, with poster sessions during breaks, and evening meetings for special interest groups. Each day began with Plenary Lectures from well-known Antarctic geoscientists covering a range of topics including tectonics, glaciation, palaeoclimate, ice cores and the International Polar Year. Of particular interest was hearing Ken Miller discuss his views on Cenozoic Antarctic glaciation, which forms the basis of the current AFI project I am involved in.

Highlights included hearing about recent palaeobotanical discoveries in Antarctica and their implications for the biogeography of the Antarctic biome. An exciting flora of mosses, liverworts, cushion plants and *Nothofagus* wood was described from a new locality of Neogene Sirius Group deposits in the Transantarctic Mountains (Ashworth et al). Further, an exceptionally preserved flora has been found in North Victoria Land, which suggests the occurrence of arid climatic periods in this region during the Triassic-Early Jurassic (Bomfleur et al). We also heard interesting details about new finds of Late Permian Glossopterid seed-ferns from the Beardmore Glacier (Taylor et al).

Related to my current interest in the James Ross Basin area of the Antarctic Peninsula, new dinosaur and plesiosaur finds were described and discussed with respect to their implications for interpreting the palaeoenvironment and palaeogeography of the region during the Maastrichtian (Case et al; Martin et al). Further, more generally, it was interesting to hear some controversial ideas on the development of Cenozoic Antarctic glaciation from a different oxygen isotope record compilation (Tripathi et al). Of technical interest and of potential importance to my current project were specific ideas on sea-ice indicators from the micropalaeontological record, both from diatoms and dinocysts. Further, posters and talks provided up-to-date information on developments in micropalaeontological software (Wise et al) and the availability of computer graphic images of Antarctica (for example, from the NASA GSFC Visualisation Studio).

On the final day, I attended an Antarctic drilling workshop chaired by Frank Rack (ANDRILL Executive Director). This was a really interesting day including updates on new and ongoing drilling initiatives, an historical overview by Peter Webb (Ohio) and an assessment of future drilling strategies by Peter Barrett (Wellington). Preliminary results were presented on the first season of SHALDRILL, plus plans for an IODP leg offshore Wilkes Land (2009), developments of ANDRILL plans for the exciting Coulman High target from the Ross Ice Shelf and future land-based drilling of Cretaceous and Tertiary sequences on Seymour Island.

The week provided me with excellent networking opportunities, catching up with colleagues from the New Zealand Antarctic community (Antarctic Research Centre and GNS Science, Wellington; Gateway Antarctica, Christchurch; Antarctica New Zealand), the British Antarctic Survey and meeting new people, of particular interest for me, from South American Antarctic programmes. I also found out about future meetings, for example an Antarctic Biogeography session at GSA and the SCAR open meeting to be held in St. Petersburg in July 2008 and potential funding opportunities for research visits (e.g. SCAR Fellowships).



As well as attending the meeting, I was also able to contribute by Co-Chairing part of the Cretaceous and Tertiary Climates of Antarctica session and, prior to the meeting, helping to co-edit the Proceedings volume (to include Extended Abstracts and Short Research Papers), published on-line now (<http://pubs.usgs.gov/of/2007/1047/>) and available as hard-copy (plus DVD) in April 2008. I would like to thank Jane Francis for presenting my talk for me due to my ongoing recovery from a period of ill health.

There were added bonuses to attending the conference! I enjoyed a fantastic exhibition at the UCSB campus Art Gallery of early Andy Warhol works from his commercial career. One evening Jane Francis had organised a well-attended (by both genders!) “Women in Antarctica” social, which was a lot of fun, including excellent slideshows of which I surprisingly featured in three out of four! Hopefully, a web-site will come out of that to record the less-than-scientific experiences of women scientists in the field ☺ I also attended a pre-conference field trip to the Colorado Plateau, which included visits to the Grand Canyon, Monument Valley, Goosenecks National Park and Triassic Chinle Formation fossil trees – a fantastic opportunity to visit these amazing sights with a bunch of like-minded people.

## 2. Research visit with Rosie Askin, Jackson, Wyoming, Sep 3-7

This was an extremely useful visit. I took with me a box of palynological slides, pre-processed in the UK, that I had been studying in Leeds, and my laptop full of photos and notes on the terrestrial and marine palynomorph taxonomy that I’d been working on. Rosie, having completed the seminal work on Seymour Island palynology, was able to help with specific questions regarding the identification of certain forms, particularly difficult groups including the *Manumiella* dinocysts, and *Nothofagidites* pollen. These are important groups to be clear on due to their biostratigraphic and palaeoenvironmental implications.

It was invaluable to actually spend time on the microscope with her going through my slides, which is of far greater educational benefit than exchanging photos over email – not least because photos only record one focus depth and may hide critical morphological details that require taxonomic discussion. We also spent a lot of time on methodology – both in the lab and on the microscope. This was very useful as I now have a polished system for palynomorph counting, and also key strategies for dealing with particular situations, for example, one particular morphotype that swamps a slide. It was also useful to discuss issues involved in palynological analysis – in particular, specific laboratory problems and the large amounts of time that are required in order to do a thorough job. I was able to discover some additional useful literature – particularly pertaining to modern analogues. Rosie indicated that she had really enjoyed my visit as it had renewed her motivation for completing some taxonomic work on Seymour Island palynomorphs, which will be of wide benefit to the Antarctic science community.

In summary, thanks again to the committee for awarding me an Antarctic Science Bursary in order to undertake these activities for the benefit of my current project and career development. As a condition of this award, a manuscript resulting from my current project will be submitted to Antarctic Science in due course.



**Breakdown of Expenditure**

		<b>ASB Budget (£)</b>	<b>Actual expenses (£)</b>
<b>ASB budget and expenditure:</b>			
Transport	Return flights (American Airlines on-line quote)	624.00	1672.20 <sup>1</sup>
	Airport transfers/public transport	25.30	29.30
Accommodation & Subsistence	Jackson research visit (accommodation)	75.90	0 <sup>2</sup>
	Jackson research visit (meals)	45.54	0 <sup>2</sup>
	ISAES conference (accommodation & meal package)	224.79	317.76
ISAES conference fees	Registration	240.35	243.72
	GCM workshop	25.30	0 <sup>3</sup>
	Pre-conference Field Trip (Colorado Plateau/Grand Canyon) & Guided Hike	273.75	259.36 <sup>4</sup>
<b>Additional expenditure from AASP conference, Panama – attended following research visit to Rosie Askin:</b>			<b>443.00</b>
<b>Overall trip expenditure:</b>			<b>2965.34</b>
<b>Total grants awarded for entire trip (including ASB at £1.341.00):</b>			<b>2586.00</b>
<b>Difference = personal expenditure:</b>			<b>379.34</b>

<sup>1</sup> Flights were complicated in the end because of the many elements of the trip: Manchester-Phoenix-Santa Barbara-Jackson-Panama-Manchester, therefore probably the most expensive flight I've ever had to book!

<sup>2</sup> Rosie was very kind, invited me to stay and wouldn't accept any money for my keep.

<sup>3</sup> I did not attend the GCM workshop in the end as closer to the conference it was clarified as a more introductory rather than an advanced course and I have previously been trained in the use and application of GCMs.

<sup>4</sup> Does not include meals and always included as personal expenditure