

K. Grey – contribution to IGCP 493 Report

2006 was a busy year for Kath Grey with numerous visitors to the Geological Survey of Western (GSWA) Australia and four months leave that allowed an extended trip to Europe and visits to various colleagues. As usual, my time was divided between managing the GSWA fossil collection, digitizing the catalogue data, handling loans and export issues, and studies of Precambrian stromatolites and microfossils from a variety of ages. At the last count, I had 27 publications in press or in preparation, although hopefully, some of these should be completed in the near future.

While on my travels, I attended the ‘Palynologists and Plant Micropalaeontologists of Belgium (PPMB) one-day meeting in Liège, Belgium, the Meteoritics and Planetary Science meeting on ‘Impact craters as indicators for planetary environmental evolution and astrobiology’ in Östersund/Lockne, Sweden, the Snowball Earth conference in Ascona, Switzerland and the Acraman Impact field workshop in Wilpena, South Australia. I also gave lectures at Leiden University and the Naturalis National Museum in Holland and paid my annual visit to Monash University to deliver a second year course on Precambrian Paleobiology.

From the Neoproterozoic point of view, Clive Calver and I submitted a paper on Ediacaran correlations in Australia for the Geological Journal IGCP 493 special issue. Nick and Carolyn Eyles and I completed a paper (accepted for Precambrian Research) on diamictites in drill cores from Australia and Peter Haines, Roger Hocking and I re-examined the Vines 1 drillcore (GSWA Record in prep.). Palynological results from this drill hole remain ambiguous (hardly surprising as diamictite is not my choice of lithology to produce meaningful biostratigraphic results), but it seems that both a Sturt Tillite equivalent (the proposed Pirrilyungka Formation) and an Elatina Formation equivalent (the Wahlgu Formation) are present in this drill hole. Małgorzata Moczyłowska-Vidal, Sebastian Willman and I continue work on Ediacaran acritarch biozonation. Results from Murnaroo 1 were published (Willman et al., 2006) and work continues on a paper reviewing global distributions of Ediacaran acritarchs. I spent a couple of weeks at Uppsala University and Sebastian spent a month in Perth examining the type collection. He and I are finalizing a paper on the taphonomy of Australian specimens. In Adelaide, Sebastian and I joined forces with Andrew Hill to do additional sampling on some of the South Australian drill holes and we were able to identify the position of the Acraman impact ejecta layer in SCYW 1a and Munta 1. Later in the year, Roger Hocking and I helped John Gorter put together a detailed well-log correlation of drill holes in the Australian Neoproterozoic that John presented at the Infracambrian conference in London. Andrew Hill, Clive Calver, Sebastian Willman, Małgorzata Moczyłowska-Vidal and I are trying to complete a manuscript on correlating the Cryogenian succession of Australia. The end of the year saw a month-long visit from Zhou Chuanming and an attempt to compare Australian and Chinese Ediacaran acritarchs. We began work on a manuscript discussing the comparison between the Doushantuo Formation and the Australian succession.

On the stromatolite front, Stan Awramik visited Perth twice during the year and we continued work on the Stromatolite Handbook (GSWA Report in prep.). Progress is slow because we both have so many other commitments. Noah Planavsky and I submitted a paper on branching in stromatolites. I continue working on a manuscript

on the complex morphology of the conical stromatolites from the Achaean Strelley Pool Chert, and I am trying (with several co-authors (including Kenichiro Sugitani) trying to tidy up a paper describing what we believe are microfossils from a slightly younger stratigraphic unit in the Pilbara. I'm still trying to finalize a paper on the Mesoproterozoic string of beads fossils with Misha Fedonkin, Ellis Yochelson and David Martin for Alcheringa, and a field guide to the stromatolites of Lake Thetis (GSWA Record) is nearly complete.

I appeared in two television documentaries, one on the Discovery Channel and SBS called 'Bacteriaworld' and one on Channel 10 about Shark Bay and featuring stromatolites.

Publications:

McKIRDY, D. M., WEBSTER, L. J., AROURI, K. R., GOSTIN, V. A., **GREY, K.**, 2006. Contrasting sterane signatures in Neoproterozoic marine sediments of the Centralian Superbasin before and after the Acraman bolide impact, *Organic Geochemistry*, 37, 189–207. (Published 01/02/2006).

WILLMAN, S., MOCZYDŁOWSKA, M. & GREY, K., 2006. Neoproterozoic (Ediacaran) diversification of acritarchs—A new record from the Murnaroo 1 drillcore, eastern Officer Basin, Australia. *Review of Palaeobotany and Palynology*, 139, 17-39.

Abstracts

GORTER, J., Grey, K., and Hocking, R., 2006, The petroleum potential of the Australian Infracambrian (Ediacaran) of the Amadeus and Officer basins. In *Global Infracambrian Hydrocarbon Systems and the Emerging Potential in North Africa*, The Geological Society, London, Petroleum Group.

GREY, K., 2006. Biostratigraphy and Neoproterozoic correlation. In Etienne, J.L., Allen, P., Le Guerroué, E and Rieu, R. (editors) *Snowball Earth 2006*, Monte Verita, Ticino. p. 43-44.

GREY, K. 2006, The Acraman impact and its influence on the geology and palaeobiology of the Neoproterozoic of Australia. In: *Abstract volume and program* (Eds. J. Ormö & H. Bergman). Abstract presented at "Impact craters as indicators for planetary environmental evolution and astrobiology", June 8 - 14, Östersund, Sweden. p. 117-118.

SUGITANI, K, NAGAOKA, T., MIMURA, K., **GREY, K.**, VAN KRAENENDONK, M., MINAMI, M., MARSHALL, C.P., ALLWOOD, A., and WALTER, M.R., 2006, Discovery of possible microfossils from c. 3.4 Ga Strelley Pool Chert, Kelly Group, Pilbara Craton: evidence for antiquity of life and biotic diversity? *Geophysical Research Abstracts*, v. 8, 02562.

WEBSTER, L. J., McKIRDY, D. M., AROURI, K. R., **GREY, K.**, and GOSTIN, V. A., 2006, Highly branched C_{3n} alkanes and the Acraman impact event in Ediacaran deep marine shales of the eastern Officer Basin, South Australia . In van Aarsen (editor) The origin and fate of naturally occurring organic matter, Australian Organic Geochemists and Natural Organic Matter Interest Group Conference Program and Abstracts, Curtin University of Technology, Perth, 69-70.