



THE INTERLAYER

The Official Newsletter of the ACMS Spring 2009

The Interlayer Newsletter is the official news source for the Australian Clay Minerals Society. Membership to the Australian Clay Minerals Society is open to anyone engaged in work relating to clay science: mineralogy, crystallography, petrology, geology; and/or the use and application of clay minerals in industry and the environment. Registration at the biennial meetings ensures membership, but additional applications for membership are invited.

ACMS Conference 2010

The next ACMS Conference will be held in Brisbane, Queensland on 6-8 August 2010. The conference is to be coordinated with the 19th World Congress of Soil Science to be held at the Brisbane Exhibition and Convention Centre from 1-6 August 2010. See www.ccm.com.au/soil for details on World Congress of Soil Science (WCSS).

WCSS has agreed to hold Commission 2.4 – Soil Mineralogy Sessions on Friday 6th August. The themes for the sessions are:

- 2.4.1 - The role of soil minerals in forming and maintaining associations in soils to ensure their future sustainability.
- 2.4.2 - Soil minerals for the uptake and control of contaminants.

Day registration is available for delegates who do wish to attend the full conference.

On Saturday 7th August, ACMS will hold a full one day conference of technical presentations and posters covering broad aspects of clay mineral research and industrial applications of clays. This will be held at the Owen J Wordsworth Centre at Queensland University of Technology located in Brisbane city and in close proximity to the venue for the Soils Congress. Sunday 8th August will be a 1 day field excursion to sites nearby Brisbane related to extraction and industrial application of clays and the role of clays in the control of soil contaminants. More details on the field excursion closer to conference time. An ACMS annual general meeting will be scheduled to follow the technical sessions on Saturday 7th August and will be followed by the conference dinner.

Updates on the ACMS Conference will be provided later in the year, with timelines for abstract submission and registration. Registration of interest is included at the end of this newsletter

and will assist with planning. However those wishing to attend the **World Congress of Soil Science** are advised that **full papers must be submitted by 31st October to be considered** (see WCSS website for details). WCSS papers for the Soil Mineralogy sessions will be offered the opportunity to have papers considered for inclusion in a theme-based issue of Applied Clay Science.

In conjunction with the ACMS Conference, the committee have agreed to offer 5 bursaries to assist students attend both the 19th WCSS and the ACMS Conference. The bursaries are for *bona fide* students and will cover the cost of student registrations for both conferences. A condition of the bursary is attendance at both conferences. Enquiries to the ACMS Hon. Secretary Dr Rob Fitzpatrick, Email: Rob.Fitzpatrick@csiro.au.

ACMS Website Updated

The Australian Clay Minerals Society website is hosted at The Australian National University. The site was revived and updated last year largely through the efforts of Emeritus Professor Tony Eggleton. Tony has a long history with ACMS and despite the downturn in clay science activity in Australia in the recent past, he is passionate that this field of research is as relevant as ever and that there continues to be a need for a specialist forum where scientists working on clays in diverse fields can come together to exchange ideas and expertise and to share experiences. If you haven't visited the site recently, I recommend that you have a browse at <http://www.clays.org.au>. Any additions or modifications to the site should be directed to the ACMS Hon. Secretary Rob.Fitzpatrick@csiro.au.

Reynolds Cup Results

CSIRO Land and Water's Mark Raven has won equal third place in the world in the international Clay Minerals Society's [Reynolds cup](#) for quantitative mineralogical analysis. Mark is the first in the Southern Hemisphere to achieve a top three place, after consistently receiving a place in the top 10 since the competition began in 2002.

The biennial international award was presented at the Clay Minerals Society meeting in New Orleans, USA, in May 2008. While Mark wasn't able to attend, Jock Churchman collected the beautiful wood and glass plaque on his behalf.



Each participant receives three samples containing a mixture of synthetic materials typically found in shale, soil and sediment. The samples contain a mixture of crystalline and clay materials and are therefore quite complex to analyse. Most participants use X-ray diffraction methods and equipment, however some use other techniques, including infrared, optical microscopy, electron microscopy, XRF and DTA.

Competition results and techniques will be written up in a journal article, co-authored by the top three place getters and will appear in *Clays and Clay Minerals* journal.

The Reynolds Cup (RC) competition was established in 2002 and is a quantitative mineral analysis exercise with the objectives of:

- enhancing the practice of quantitative mineral analysis
- recognising and promoting excellence in quantitative mineral analysis
- testing the state-of-the-art in mineral analysis
- providing mineralogists and others in the scientific community with an avenue to evaluate and improve their analytical practices.

The RC competition leads to the development of new analytical techniques, new and improved equipment, and software.

The 5th Reynolds cup will be announced towards the end of 2009 with samples shipped early 2010. Results to be returned at least 1 month before the next CMS meeting, 6-11 June 2010, Seville, Spain! Samples are limited to approximately 60 sets so get in early if you want to be a part of the next contest. Anyone wishing to "try their hand" at complex quantitative XRD analysis of the previous Reynolds Cup samples,

Email Mark.Raven@csiro.au for copies of the digital XRD data.

Journal News

Applied Clay Science. The Editors-In-Chief of *Applied Clay Science*, Jock Churchman and Gerhard Lagaly have brought the journal up in citation standings to a 2008 index of 2.01 and a five year index of 2.49, as published by the ISI. *Applied Clay Science* is now the 6th highest ranked journal in mineralogy.

Workshop Lecture Series goes Electronic. The Special Publications Editor for the Clay Minerals Society, Will Gates, along with the Editor-in-Chief (Joe Stucki, USA) and Managing Editor of *Clays and Clay Minerals* (Kevin Murphy) have turned the well known CMS Workshop Lecture Series (WLS) into electronic print-on-demand volumes. This was done in an effort to lift the WLS profile, speed up publication time and enable the series to be listed by the web-based citation indexing services (eg, ISI and Scopus). In the near future, those interested will be able to purchase the volumes, or individual papers, via an on-line service.

International Conference Reports

Mid-European Clay Conference, Zakopane, Poland, September 2008. Will Gates attended this well organized meeting of the Mid European Clay groups from Croatia, Czech Republic, Hungary, Poland and Slovakia, as well as the clay groups from Germany, Austria and Switzerland. The venue (Hotel Bellvedier), nestled against the Tatras Mountains that border Poland and Slovakia, provided a beautiful backdrop to some excellent technical sessions and social events. An easy 15 minute walk took you to the resort town of Zakopane with its historic markets, great food and excellent Polish beer.

Dr Katarzyna Górniak and the organizing committee provided more than 180 attendees from 28 countries with technical sessions ranging from geologic occurrence of clay deposits, nanomaterials, industrial clay minerals, iron rich clays, layered double hydroxides and structure and synthesis of clays. Plenary Lectures, including the history of clay mineralogy by Leszek Stoch, everything you wanted to know about *cis* and *trans* vacant varieties of layer silicates by Victor Drits and the origin of the Mediterranean variety of the *Terra Rosa* soil, started off each day, before the participants split into as many as three concurrent sessions.

Post conference field trips (the Pieniny Klippen Belt geology, diagenesis of bentonites in the Podhale flysch basin and a snow-bound trip to the sub-alpine soils of the Tatras) were well attended. As expected, the social program was as much a highlight as the science presented. The welcome party and the mid-conference folk dinner, both accompanied by local musicians wearing traditional outfits, as well as ample food and drink, provided the essential opportunities for networking. The conference dinner was a four-C rated (Classic Clay Conference Corroboree) with dancing 'til the cows went out the next morning.

46th Annual Meeting of The Clay Minerals Society, Billings Montana, June 2009. Balwant Singh and Will Gates attended this small, but well-organized meeting of the US-based clay group. The venue was the Crown Plaza Hotel in downtown Billings, Montana. While not as spectacular a setting as Zakopane, Billings is located in a narrow valley between the Yellowstone river and 300 m cliffs of Eagle sandstone, which were dusted in snow on the opening day of the conference. Billings is also an old stomping ground of W. Gates, so the conference was a bit of a homecoming.

Richard Brown and the organizing committee provided pre-conference field trips (to the bentonite deposits in Wyoming), excellent technical sessions and social events. This time, the conference proper started on a Sunday so the Workshop (on hydrothermal and biogenic clay mineralization organized by Paul Schroeder) could be held mid-week and *in situ* - in Yellowstone National Park.

Technical sessions covered applications of bentonite, medicinal uses of bentonite, clays and environmental contaminants, a session on innovation and entrepreneurship, quantitative mineralogy, industrial mineralogy, clays and energy, iron in clays, isotopes in clays and a special "Feats of Clay" session. Each day's technical session was begun with the plenary lectures, where deserving clay scientists were honored for their work. Lynda Williams provided a compelling Mid-Career Clay Scientist Lecture on the role of clay mineral stable isotopes in preserving a record of organic processes. Mike Hochella provided the much enjoyed Brindley Lecture and Joe Stucki led the audience in singing "A Hundred Pounds of Clay" during his Bailey Lecture. The "Feats of Clay" session, held on the last afternoon immediately after the CMS business meeting was an excellent first-ever - featuring three speakers and providing intellectually

stimulating talks on the roles clay mineralogists could or should play in areas of mineral safety (Bill Moll), energy production (Paul Nadeau) and black carbon (David Laird).

The Banquet attendees were entertained with a multi-faceted story of extinctions by the famous Paleontologist Jack Horner, curator of the Museum of the Rockies. Billings hosts some excellent brew pubs, all within an easy walk, so that evening sessions were also well-attended.

14th International Conference: one delegate's impressions - Jock Churchman

A conference report is unlikely to be objective, except for the facts, so let's first dispose of those. International Clay Conferences are held every 4 years, under the auspices of AIPEA, the Association Internationale Pour L'Etude des Argiles AIPEA; otherwise they are conducted in English. This 14th ICC was held on the Mediterranean Coast of the instep of Italy - at the far south, not quite in summer, but it was still quite hot. It was held at a resort, which was taken over by the 700 odd (take it as you will) delegates and quite a few accompanying persons. There are a few models for conferences; this one isolated us from cities and shops, but there was a beach nearby and a swimming pool on site. Replacing the usual expensive distractions with diversions that were free, I guess. And there was always the bar (not free) on site.

There were 408 oral presentations and 548 posters, with 3 or 4 parallel sessions for the former and a late afternoon time for the latter. There was a plenary lecture each day and the organisers came up with some really interesting speakers and topics, from both outside and within the clay community. 'Clays and the origin of life' and 'Extraterrestrial clays as recorders of past habitability' were the most novel of the topics. The actual sessions were organised by a very democratic, Wikipedia-type process, whereby anyone who could get enough speakers for a topic thereby had one arranged (and organised by its proponents). The conference offered two "compulsory" half days of relief from the sessions and a chance to see two nearby World Heritage Areas (The "Trulli" dwellings of Alberabello and the city carved into rock at Matera).

Necessarily one's own impressions are coloured by one's choices. For myself, attendance at the Soil Mineralogy sessions was obligatory since I'd help put these together. Mostly, papers were good, with the most disappointing aspect being the several delegates who did not turn up to present. Pressure to "publish", even Abstracts in a Conference

Program, is a likely cause. On the positive side, Australia featured strongly at the conference and especially in the Soil Mineralogy sessions, which were opened by a keynote by Rob Fitzpatrick that covered a wide range of applications of soil mineralogy. Some of the Australian delegates are shown in the photo below. Ray Ferrell from the USA is also pictured in this photo (far right) – we did mix with others!



Other noteworthy Australian contributions were by Gavin Gillman (Townsville) as keynote speaker in the session on “Clays and Environmental Friendly Materials, Murray Lines (Stratum resources, Sydney) as invited speaker in the “Industrial Applications of Nanoclays” session and Bob Gilkes (UWA), who stepped in at the last minute to fill a vacated gap in the Soil Mineralogy program. Although not present, Will Gates (Smectech, Melbourne) and Laurie Aldridge (Sydney) were co-convenors of the session on “Moisture Transport through Clay”. Balwant Singh (U Sydney) was elected to the Council of AIPEA for the next 4 years.

Soil mineralogy aside, I was excited by some of the new developments that are making clays both more useful and of more interest to other specialists. I found a session on the interface between biology (life) and clays especially exciting. Someone even proposed (and is studying) the use of hybrids of clays with biological compounds to induce the formation of specific antibodies for protection against strains of influenza, including swine flu. Even so, advanced instrumental techniques were featured often in presentations. Among these, synchrotron-based X-ray spectroscopic techniques got a good airing and there were also many papers using neutrons, especially when water was involved – as it often is with clays. Of course, X-ray diffraction for both identification and structure determinations continues to reign supreme as a technique for clays – and electron microscopy gives the best pictures.

It is impossible for one delegate to cover the wide range of topics covered by the conference. Some such as clays in archaeology and new types of ceramics could only be glimpsed in passing on posters while there was sometimes a chance to dip one’s toes into parts of sessions on such alluring up-to-date topics as clays and climate change, carbon sequestration and nano-materials (but haven’t clays always been nano!), plus the usual (but modern) suspects like layered double hydroxides, self-assembly, polymer nano-composites – the list goes on. It was a friendly conference – they always are. Not too big, but then again not so small, so that it did sometimes require an effort to find particular people. Even so, with most living on site, the chances of meeting scientific soul mates were increased considerably. The next ICC is in Rio de Janeiro, Brazil in 4 years’ time. That could be a bit different – in an exciting sort of way, although, as a clay conference, it should still be a friendly and informative occasion.

Award of AIPEA Fellow to Jock Churchman

At the 14th ICC, Jock Churchman was recipient of the prestigious award of AIPEA Fellow presented by David Bish, AIPEA President (see below). The award recognises Jock’s outstanding contributions to soil mineralogy and clay science and the application of his knowledge to the benefit of the environment and industry.



**Australian Clay Minerals Society 21st Biennial Conference
ACMS 2010**

6-8 August, 2010 Brisbane, Qld

Indication of Interest : Conference Registry

Name: _____

Affiliation: _____

Email: _____

Address: _____

Fax/Phone: _____

() I plan to submit an abstract to the 19th World Congress of Soil Science

Deadline for abstracts is 31 October 2009.

() I plan to submit an abstract to the 21st ACMS Conference Brisbane

Deadline for abstracts is 31 May 2010.

Please fill out and send to: Mark Raven, ACMS 2010 Treasurer, CSIRO Land and Water, PMB No. 2, Glen Osmond, SA 5064, Email: Mark.Raven@csiro.au . Electronic registration for the conference on the society's website will be available closer to the conference date: <http://www.clays.org.au> (electronic registration coming soon!)

Australian Clay Minerals Society

Membership Registry

We need your help. Do you know of others who should be receiving, or would like to receive, copies of the **Interlayer Newsletter**? Membership to the ACMS is open to professionals, academics industrialists, and students engaged in work relating to clay mineralogy, crystallography, petrology, geology and/or the use and application of clay minerals in industry and the environment. Registration at the biennial meetings ensures 4-year membership, but additional applications are invited. Simply fill out the form and send it in.

Name: _____

Affiliation: _____

Tick one: University() Student() Industry() Government() Private() Other()

Address: _____

email: _____

fax/phone: _____

Distribution requests for Interlayer Newsletter and items for inclusion should be addressed to: ACMS Hon Secretary, Rob Fitzpatrick c/- CSIRO Land and Water, PMB No. 2, Glen Osmond, SA 5064, Email: Rob.Fitzpatrick@csiro.au