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## The Clay Minerals Society

### 'BRIDGING CLAYS' – CMS ANNUAL MEETING 2006

This year for the first time, the Clay Minerals Society held its annual meeting outside North America. The meeting was held jointly with the Groupe Français des Argiles (GFA) in early June in France. Following the format of recent years, the meeting was preceded by a one-day workshop, this year on the subject 'Polymer–Clay Nanocomposites', at the University of Poitiers and organized by Katie Carrado (Argonne National Laboratory) and Faïza Bergaya (CNRS, Orléans). The workshop was deemed a great success by the 81 participants, and a Workshop Lecture Series volume based on the presentations will be published soon. The main meeting was held on Oléron Island in the Bay of Biscay, north of the Gironde estuary. As this location is 200 km from Poitiers, workshop participants and some others made the connection between the two by coach. In the form of a field trip, the journey included visits to the delightful medieval villages of Montmorillon and Nontron (something of a pilgrimage for clay scientists) and the Cognac Museum.



Bridging Clays

The venue on Oléron Island was 'Village Vacances Vielle Perrotine', a CAES CNRS Centre, which is dedicated to CNRS family holidays but includes conference facilities. As there were 282 participants, considerably more than anticipated, the poster sessions and two of the four concurrent sessions were held in large tents, while the plenary sessions were conducted in the main conference room. The beautiful sunny weather and the holiday-type surroundings created a very relaxing atmosphere for the meeting. The truly international nature of the meeting was evident from the fact that delegates came from 37 countries: France as the host country had 101 delegates, 53 came from North America, 29 from countries outside North America and Europe, and the remainder from European countries other than France.

After the opening ceremony, at which local delegates, representatives of CNRS (one of the main sponsors) and the University of Poitiers, Faïza Bergaya (president of GFA) and Cliff Johnston (president of CMS) spoke, Theo Kloprogge (Queensland University of Technology), as the recipient of the Jackson Mid-Career Award, delivered the lecture 'The Application



Clay mineralogists en route to historic Montmorillon

of XPS to Clay Science'. Plenary sessions began the next two days. Fred Wicks (Royal Ontario Museum) gave the Bailey Distinguished Member Award lecture 'Serpentine Minerals, the Mystery is Gone: You Too Can Identify Them', and Jean-Maurice Cases (CNRS) gave the Pioneer in Clay Science lecture 'Textural and Energetic Surface Properties of Clays Using Gas Adsorption Procedure'.

The technical programme, conducted in four parallel sessions, consisted of nine thematic sessions and two symposia covering a wide variety of topics, reflecting the great diversity of clay science. These included 'Clays in Petroleum Systems', 'Polymer–Clay Nanocomposites', 'Iron Oxidation–Reduction in Clays', 'Clay–Water Interactions and Colloidal Behaviour of Clay Minerals', 'Equilibrium and Disequilibrium in Low-Temperature Processes', 'Environmental Mineralogy and Toxic Metals', 'Soils, Weathering and Alterations', 'Environmental Clay–Organic/Water Interactions', 'Clays and Clay Minerals in Extraterrestrial Environments', 'Advanced Techniques for Clay Minerals: Characterization' and 'Clays – From the Quarry to Industry'. Presentations were of consistently high quality, and many, both oral and poster, were made by young researchers, auguring well for the future. Awards were made to the winners of this year's Reynolds Cup contest, and details are given in a separate article. Socializing during breaks and meals, which were included in the conference fee, was undoubtedly facilitated by the dispenser in the restaurant labelled *blanc, rosé, et rouge*.

The main social event was a dinner in the Aquarium at La Rochelle, and to get there, delegates embarked on a wonderful cruise in the Bay of Biscay in lovely sunny weather, past Fort Boyard and through the heavily fortified entrance to the beautiful harbour at La Rochelle.



The striking Fort Boyard between La Rochelle and Oléron Island

This meeting was a great success in every way. It brought together clay researchers from all over the world in a venue that provided a relaxing ambience for enthusiastic discussions and presentations about the topic which binds us together – clay. This was all made possible by the prodigious efforts, organizational skills, attention to details and dedication of Sabine Petit and her team of willing helpers at HydrASA, University of Poitiers. To them all, and particularly to the indefatigable and unfailingly helpful Sabine, we are extremely grateful, and we can only say “*Merci beaucoup*”.

Next year, the annual meeting will return to North America and will be in Santa Fe, New Mexico. It will be on the theme ‘Enchanted Clays’ and will feature associated field trips. However, because of the success of the meeting in France and because about 40% of the members of The Clay Minerals Society reside outside of the North American continent, the society will be considering another meeting at a venue other than in the USA, as a joint venture with another national clay society.

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PHOTOS COURTESY OF WARREN HUFF,  
CLIFF JOHNSTON AND RICHARD BROWN



**44th Annual Meeting  
of the  
Clay Minerals Society**

**June 2-7, 2007  
Santa Fe, New Mexico, USA**

**Field trips June 2, 5, and 7  
Workshop Carbon stabilization by clays in the environment June 3  
Technical sessions June 4-6**



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## RESULTS OF THE 3<sup>rd</sup> BIENNIAL REYNOLDS CUP CONTEST

Results of the CMS third biennial Reynolds Cup (RC) contest in quantitative mineral analysis were announced at the 2006 CMS/GFA annual meeting in Oléron, France. The winner of the contest was Douglas McCarty of Chevron, Texas, followed by Stephen Hillier of the Macaulay Institute, Aberdeen, Scotland and Reinhard Kleeberg of TU Bergakademie, Freiberg, Germany. Sixty sample sets were distributed and 37 individuals from 18 countries returned results, an increase of 5% over the last contest in 2004. The quality of the top seven entries was outstanding and provides an eye-opener to the patience and expertise required for accurate quantitative mineral analysis.

All participants received three samples made from ‘pure’ minerals commonly found in sedimentary rocks. Samples 1 and 2 com-

prised five clay minerals and twelve non-clay minerals each. The challenge in these samples was the accurate identification of different feldspars and the differentiation of 2:1 clay minerals (Al-clays in sample 1 and Fe-clays in sample 2). Only one participant correctly identified minor phases like zircon and tourmaline in sample 1. Mixed-layered illite-smectite in sample 1 and glauconite-smectite in sample 2 were seldom reported. Sample 3 was perhaps the most difficult despite having the smallest number of phases (10). The presence of poorly crystalline opal-CT and 2:1 trioctahedral clay mineral (saponite) made quantification of either phase difficult. The entries were ranked by the sums of the differences between the actual compositions and the compositions obtained by the participants (bias).

Most of the participants used X-ray diffraction for identification and quantification. The more successful entries, however, used a range of supplementary techniques, including elemental analysis, grain-size or magnetic separation, infrared spectroscopy, and thermogravimetric analysis. Participants using a synchrotron X-ray source were more successful at identifying minor, non-clay mineral phases. One participant used Mössbauer spectroscopy to correctly identify most of the Fe-bearing minerals.

The top three finishers used different quantitative X-ray diffraction methods. The winner used a variation of the single-line reference intensity ratio (mineral intensity factor) method based on pure mineral standards, with elemental composition optimization. Cation exchange capacity and thermogravimetric analysis were used as supplementary techniques. The runner-up also used a reference intensity ratio method with pure standards, but based on whole-profile fitting. The third-place finisher used the Rietveld method for quantification and identification of minor phases (using difference plots) and also used SEM/EDS to identify minor components and verify the composition of structures used in Rietveld analysis. Details of the top three quantitative methods will be published in a forthcoming issue of *Clays and Clay Minerals*.

The CMS presented commemorative plaques and cash prizes to the top three finishers and \$1000 towards travel expenses for the contest champion, who also received a trophy. The next competition will be held in 2008, with registration commencing in January 2008. Details of the competition are available at [www.clays.org/reynoldscup.html](http://www.clays.org/reynoldscup.html)



Reynold's Cup presentation – from left, Douglas McCarty (1<sup>st</sup>), Steve Hillier (represented by Derek Bain – 2<sup>nd</sup>), Reinhard Kleeberg (3<sup>rd</sup>) and Dipo Omotoso (contest organizer)

**Dipo Omotoso**

Natural Resources Canada