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The Clay Minerals Society

PRESIDENT'S CORNER

Andrew Thomas in New Orleans with John Bloch, enjoying some light refreshments

Participating in the CMS over the last 25 years has given me the opportunity to discuss clay minerals and sandstone diagenesis with many outstanding investigators. One of them, Ray Ferrell, passed the baton to me at the CMS/ACS meeting in New Orleans in April. Ray, your efforts are to be applauded and we offer you our sincere thanks for your excellent leadership over the past year. Brenda Ross is to be commended also for her efforts as the CMS chair for New Orleans in conjunction with the ACS Division of Geochemistry chair Tim Filley. The meeting content was excellent, and a revitalized downtown New Orleans offered many opportunities to sample the local flavor.

The Council and committees of the Clay Minerals Society are wonderful all-volunteer groups, and each year at this time the personnel of these is renewed. I want to say thanks in advance to all of the new volunteers who have responded favorably to my requests for service. It is a pleasure to be received with such enthusiasm. In addition, we offer our collective thanks to those who have served this past year. The Society has many opportunities for volunteerism and creative thought, and we still have a few positions available at the time of writing. CMS service can be most rewarding, and always results in new relationships. I have made an effort to incorporate some students and newer members in our committees to get some additional perspective this year. The nearly complete committee membership should be available for viewing at our website, www.clays.org. Anyone interested in working with us should drop me an e-mail.

Did you know that at some point in the last year, our membership switched from our traditional North American majority to an international majority. A membership survey conducted a few years ago put a voice on this trend when many suggested that more international CMS meetings, similar to France 2006, would be welcome. With that as a backdrop we are pleased to announce that the 2010 meeting will be in Spain as a joint meeting of the Spanish clay group, the Japanese clay group, and the CMS. Our 2009 meeting is set for Billings, Montana, and we expect it to be a rewarding experience. Stay tuned for more details.

As your president, I look forward to this year and the challenges that it will bring. If you have ideas regarding your Society, I would be delighted to hear from you.

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NEW ORLEANS 2008 – THE CMS AWARDS

The CMS recognized four outstanding clay scientists during an awards symposium at its recent annual meeting held in conjunction with the Geochemical Division of the American Chemical Society in New Orleans. The honorees included professors Norbert Clauer, Hailiang Dong, Emilio Galán, and Robert Gilkes.


Norbert Clauer, winner of the Bailey Award, in New Orleans

The **MARILYN AND STURGES W. BAILEY AWARD**, the highest honor of The Clay Minerals Society, is awarded for scientific eminence in clay mineralogy as evidenced primarily by the publication of outstanding original scientific research and by the impact of this research on the clay sciences. The 2008 recipient of the Bailey Award is Professor Norbert Clauer of the French National Research Council. Norbert delivered a lecture entitled "Clay Isotope Geochemistry: A Contribution beyond Dating." He reviewed how techniques play an important role in isotope studies and noted that most clay minerals in supergene environments are potentially datable by isotopic means. The reported difficulties are not due solely to the methods, but to technical aspects or natural polygenic mixings. Scattered "ages" do not result from varied closure temperatures, as in high-temperature minerals, but from mixing of particles with varied origins and in different stages of evolution. Clay "ages" depend mainly on mineral heterogeneity, but also on fluid chemistry, crystal-growth kinetics, reaction temperature, and basin history. Interpretation of clay isotope dating requires mineralogical, geochemical, and field information. He further outlined what can be expected beyond isotope dating: isotopes provide a powerful tool for tracing physical and chemical conditions during nucleation and crystal growth. Modern applications of isotopes to clay genesis have benefited greatly from Clauer's accomplishments and dedication to research.


Bob Gilkes delivering the G.W. Brindley Lecture

Professor Robert (Bob) J. Gilkes, of the School of Earth & Geophysical Sciences at the University of Western Australia, delivered the 2008 **G.W. BRINDLEY LECTURE** on the topic "The Dregs of Weathering: Secrets of Kaolin and Iron Oxides in Tropical Soils." The G.W. Brindley Lecture recognizes a clay scientist who will infuse the Society with new ideas, someone who is a dynamic speaker and is involved in innovative research. Bob reviewed how kaolin and iron oxides, formed in extreme weathering environments, exhibit a diversity of crystal properties and compositions that help to explain variations in geochemistry and soil fertility in apparently quite uniform soils. Thus differences in kaolin crystal morphology can be used to trace the origins of complex polygenetic regolith materials, thereby aiding mineral exploration. Iron oxides can accommodate many metal substituents, and an understanding of this process helps explain both the formation and exploitation of ore deposits. Climate change has left its imprint, as fire and aridification have modified kaolin and goethite, formed under previous, wetter climates. Bob's review of progress in this area of research formed the basis for a lecture that George Brindley would have been proud to deliver.


Emilio Galán, somewhere nice and sunny

"Origin and Fate of Toxic Elements from Abandoned Mining Activities in the Rio Tinto Area (Iberian Pyritic Belt, Spain)" was the topic of the **2008 PIONEER IN CLAY SCIENCE LECTURE**, delivered by Professor Emilio Galán from the Department of Crystallography, Mineralogy, and Agricultural Chemistry at the University of Seville, Spain. In his presentation, Emilio provided examples of research contributions that have led to important new directions in clay minerals science and technology applied to environmental problems. The Iberian Pyrite Belt (IPB) in southern Portugal and southern Spain is one of the largest metallogenic provinces

of volcanic-hosted massive sulfide deposits in the world. During the last 5000 years, the IPB has been mined for Cu, Zn, Pb, Au, and Ag. As a result of intensive mining and smelting of sulfide ore bodies close to the mines, a huge volume of waste of different types has been produced and carelessly abandoned, generating a great number of polluted locations containing As and heavy metals (Cd, Cu, Pb, Zn, Mn, Fe). Acid mine drainage contributed by disseminating the toxic elements into rivers, sediments, and soils. Recent research on the sources, causes, distribution, partitioning, mobility, and bioavailability of the principal toxic elements of the Rio Tinto area were presented and discussed by Professor Galán.

TEM image of Hailiang Dong

The 2008 **MARION L. AND CHRYSTIE M. JACKSON MID-CAREER CLAY SCIENTIST AWARD** was presented to Professor Hailiang Dong of the Department of Geology at Miami University, Ohio. The smectite to illite (S-I) reaction was the main theme of his lecture, entitled "Research on the Smectite-Illite Reaction: Past History, Current Status and Future Trends." The S-I reaction is one of the most important reactions in clay-rich rocks during sedimentary diagenesis, as the degree of the reaction is linked to the maturation, migration, and trapping of hydrocarbons, to rock cementation, and to water chemistry. Application of transmission electron microcopy since the late 1980s has contributed much to our understanding of the crystal-chemical relations and the reaction mechanisms. At the same time, microbes were recognized as important agents mediating the iron redox cycle in smectites. Recent evidence demonstrated that iron-reducing microbes can accomplish the S-I reaction at much lower temperature and pressure than in the absence of microbes, which has important implications for refining the S-I reaction kinetic models. Currently, technologies are being developed to use microbially reduced smectite/illite to remediate environmental contaminants. Research on this important reaction will likely continue, with important theoretical and practical implications. Hailiang clearly demonstrated how he has contributed new knowledge to clay minerals science through original and scholarly research.

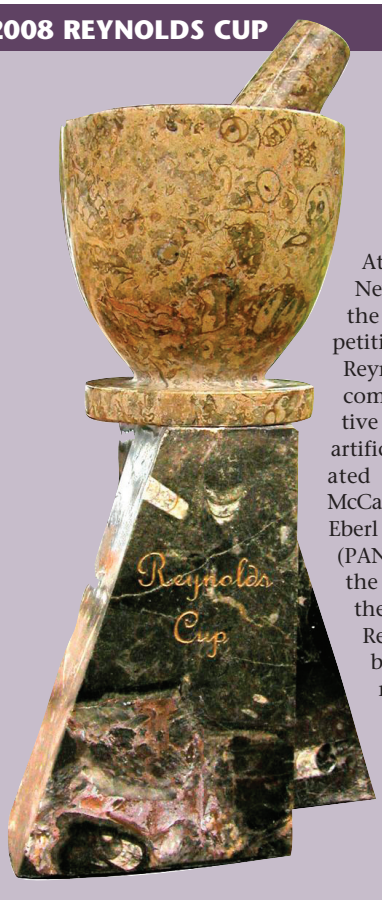
STUDENT TRAVEL AND RESEARCH GRANTS

The CMS awarded travel grants to fourteen students to attend the annual meeting in New Orleans. Travel grant recipients for 2008 were:

- **Ziming Yue**, Department of Geological Sciences, University of Alabama, Tuscaloosa
- **Matt Landers**, School of Earth and Geographical Sciences, The University of Western Australia, Perth
- **Shanshan Ji**, Department of Geology, Miami University, Ohio
- **Connie Constan**, Department of Anthropology, University of New Mexico, Albuquerque
- **Anastasia G. Ilgen**, Department of Chemistry & Biochemistry, University of Alaska, Fairbanks
- **Arpita Pal Bathija**, Department of Petroleum Engineering, Colorado School of Mines, Golden
- **Kiran Rana**, Department of Agronomy, Purdue University, West Lafayette
- **Liming Zhu**, Department of Geological Sciences, University of Indiana, Bloomington
- **Jason Perrin**, Department of Chemistry, Stephen F. Austin University, Nacogdoches
- **Bryan R. Bzdek**, Department of Chemistry, Bucknell University, Lewisburg
- **Kristen Baugh**, Department of Chemistry, Stephen F. Austin University, Nacogdoches
- **Mohammad Ali Hooshiar Fard**, Chemical and Materials Engineering, University of Alberta, Edmonton
- **Ghanashyam Neupane**, Department of Geological Sciences, University of Alabama Tuscaloosa
- **Tanya Borchardt**, School of Life Sciences, Arizona State University, Tempe

Two research grant awards were also made to Jie Wang for "Themodynamics of Ion Exchange in Zeolites," Department of Geological Sciences, The University of Florida, Gainsville (Phillip Neuhoff, advisor); and to Ashley Williams for "A New Direction for the Use of Modified Zeolites in Water Purification," Division of Biological Sciences, University of Montana, Missoula (Philip W. Ramsey, advisor). Jie Wang's proposal was unanimously judged to be the best in 2008, and therefore he is the recipient of the Reynolds Prize for 2008.

THE 2008 REYNOLDS CUP



At the CMS meeting in New Orleans, the results of the 4th Reynolds Cup competition were announced. The Reynolds Cup is a biennial competition in the quantitative analysis of clay-bearing artificial mixtures. It was created in 2002 by Douglas McCarty (Chevron ETC), Dennis Eberl (USGS), and Jan Środoń (PAN, Poland). They named the competition in honor of their friend and teacher Bob Reynolds (1927–2004), a brilliant scientist and pioneer in clay mineralogy who received the Roebling Medal for his work in 2000.

The goals of the competition are to promote and stimulate quantitative analysis and to recognize new and successful approaches to the quantitative analysis of clay-bearing samples. The anonymous nature of the contest guarantees a sporting and collegial atmosphere because only the names of the top contenders are made public. The participants are sent three artificial mixtures, and they must identify and quantify all of the components.

This year's competition was organized by Douglas McCarty and Edwin Zeelmaekers (K.U. Leuven) and saw 53 individual scientists or teams from 17 countries competing for the Cup. The competition was won by a wide margin by Steve Hillier (Macaulay Institute, Scotland). Oladipo Omotoso (CANMET, Canada) and Reinhard Kleeberg and Kristian Ufer (TU Bergakademie Freiberg, Germany) tied for second place. Four entries tied for third place: Katja Emmerich and Annett Steudel (University of Karlsruhe, Germany), Steve Chipera (Chesapeake Energy Corporation, USA), Dennis Eberl and Alex Blum (USGS Boulder, USA), and Mark Raven (CSIRO, Australia).

The Reynolds Cup will continue its tradition in 2010, and the 5th competition will be organized by Steve Hillier.