The Clay Minerals Society

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THE PRESIDENT'S CORNER

Jan Srodon

This is my first President's Corner. As such, I will take this opportunity to welcome all members of the Clay Minerals Society (CMS) and all the other friends of clays. Let me also introduce myself. I joined the CMS exactly 40 years ago when I was a postdoc with John Hower at Case Western Reserve University (Ohio, USA). Since then, I have considered the CMS to be my professional home. This society is, in my opinion, the best platform by which to integrate the world's clay community. The CMS is an American scientific organization, but 60% of its members are from outside the US, and the same applies to the authors of CMS's journal (*Clays and Clay Minerals*) and to participants in the Reynolds Cup, which is an international contest in quantitative mineral analysis of rocks that is organized every two years by the society. Another international service provided by the CMS is the Source Clays project: this supplies clay materials used worldwide in clay-related research. Furthermore, annual meetings of the CMS are important international events – the most recent one being hosted in Atlanta (Georgia, USA) and described briefly below.

The CMS is unique as an integration platform because of its multidisciplinary character: it unifies geologists, soil scientists, mineralogists, chemists, and material scientists. The basis for this unification is not the approach but the object of interest: clay, which accounts for over one third of the mass of sedimentary rocks. For some of us, clay is a mineral; for others, it is an important component of rocks or soils; and, for most of us these days, it is a material that can be modified and used in endless applications. Mankind's interest in clay as a versatile utilitarian material dates back many thousands of years: some ceramic pots and sculptures (terracotta) date from ~13,000 BC; the sorption properties of clays (fuller's earth) have been used since 5000 BC; and medical applications of clays were first reported on clay (!) tablets from Mesopotamia from about 2500 BC.

Today, there is a resurgent interest in clays as materials: this resurgence has dominated the entire clay-science field over the last decade and has had repercussions across many related disciplines. The very name given to the scientific theme at the 53rd Annual Meeting of the Clay Minerals Society (held early June in Atlanta) was "Resurgent Clays." And this theme had additional resonance because Atlanta's official city motto is "Resurgens," which is Latin for "rising again".

The 53rd Annual Clay Minerals Society Meeting honored Prof. Charles E. (Chuck) Weaver, emeritus professor at the Georgia Institute of Technology (USA), and recipients of the three of our highest awards: Dr. Janice Bishop (SETI Institute, California, USA) who received the Marion L. and Chrystie M. Jackson Mid-Career Clay Scientist Award; Dr. Lisa Heller-Kallai (The Hebrew University, Israel) who received the Marilyn and Sturges W. Bailey Distinguished Member Award; and Dr. Donald L. Sparks (University of Delaware, USA), the Pioneer in Clay Science Award recipient. The CMS also conferred several awards to students in the form of research awards and travel grants. The Reynolds Cup this year was won by Gilles Mertens and Rieko Adriaens of QMINERAL & KU Leuven / ONDRAF-NIRAS Heverlee (Belgium). Congratulations! A detailed report on the Atlanta conference will be given in the October 2016 issue of Elements. The 54th Annual Clay Minerals Society Meeting will be held next summer in Edmonton (Alberta, Canada).

Jan Środoń (ndsrodon@cyf-kr.edu.pl)
President, the Clay Minerals Society

STUDENT RESEARCH SPOTLIGHT

Congratulations to **Christopher Jorgensen** (Ohio University, USA), **Sebastian Cardona** (Colorado School of Mines, USA), **Sabrina Sharmeen Alam** (Texas A&M University, USA), and **Cherie Achilles** (The University of Arizona, USA) for winning a 2015 CMS Student Research Grant! We will feature the 2016 winners in future issues of *Elements*.

Christopher Jorgensen's research is focused on **understanding rift lake hydrology** by examining the lacustrine lower Portland Formation in the Mesozoic Hartford Basin of Connecticut (USA). He uses primary sedimentological and petrographic data from wireline rock cores (>700 m of section) to better understand how Portland Formation facies, and the sub-environments they represent, are distributed within a rift valley. Biomarker analysis and powdered X-ray diffraction of the clay-sized fraction of lacustrine mudrocks and paleo-vertisols will be used to identify major changes in basin hydrology in an effort to decouple the roles of climate and active tectonics on lake formation and lake character during the final stages of rift abandonment.

Sebastian Cardona is **investigating the sealing properties of mass transport deposits (MTDs) in deep water settings**. Sebastian is integrating different data sets and methodologies (such as seismic, well log, outcrops and microscopic data) from offshore sites in the Eastern Gulf of Mexico and the deep water outcrops of the Taranaki Basin, New Zealand. With the support of the CMS 2015 Research Grant, Sebastian will analyze samples collected during his last field-season in New Zealand by X-ray diffraction, scanning electron microscopy, and X-ray texture goniometry to better understand strain facies within MTDs at the microscopic scale.

Sabrina Sharmeen Alam is **evaluating the efficiency of certain smectites to bind aflatoxin during biofuel production**. The specific goal of Sabrina's research is to reduce aflatoxin toxicity in dried distiller's grain (a co-product of ethanol production that is used as animal feed) by using smectites in the corn fermentation solution. Although smectites have a very high aflatoxin adsorption capacity in water and ethanol, as revealed by XRD and FTIR, proteins that exist in the fermentation solution tend to significantly interfere with aflatoxin adsorption onto normal smectites. However, smectites that have been modified by small organic compounds, such as choline and carnitine, remarkably reduce the interlayer fixation of the troublesome proteins yet still allow aflatoxin adsorption.

Cherie Achilles is **analyzing XRD data from the Mars Science Laboratory (MSL) rover's CheMin instrument**. During MSL's exploration of a proposed paleo-lacustrine environment in Gale Crater (Mars), two mudstones investigated by the CheMin instrument revealed the presence of clay minerals along with other crystalline and amorphous phases. Determining what type of clay mineral is present – whether it is dioctahedral or trioctahedral – should help to distinguish between authigenic and diagenetic formation processes. This, in turn, will influence how scientists interpret Martian depositional environments. Cherie is exploring whether CheMin XRD data can accurately distinguish between di- and trioctahedral clay minerals.