The Clay Minerals Society

www.clays.org

THE PRESIDENT'S CORNER

Jan Srodon

My first message, in the June issue of *Elements*, centered on the usefulness of the Clay Mineral Society (CMS) for you – clay scientists. I argued that the CMS provides essential services for the clay community. I hope it was convincing and that you agree that we need scientific societies as vehicles for pursuing certain common objectives. And that we, in particular, as people who work on clays, need the Clay Minerals Society. Assuming such common ground, I am going to consider the opposite aspect of this relationship: what you can do for the CMS.

The least demanding service you can provide is just being a member, which means—on the basic level—paying dues on time and voting for the society officers. This does not sound like much, but, for a society such as ours, it is absolutely essential. We are a small society, about 350 members strong, so every member makes a difference. And as a member, you are part of the community effort that provides the services that we all benefit from. We all know that there is no such thing as a free lunch. So, please consider the thoughts expressed here. The 2017 renewal deadline is coming.

You can also go one step further and encourage your colleagues to join and/or your institution to become a Sustaining Member, Patron, or Benefactor. Our society could not offer the level of service to the clay community that we do offer without such extra generous help from institutions and individuals.

The next level of involvement is serving on the society's committees. We have 12 committees with over 40 people, most of whom serve 3-year terms. Some require more work, others less, but this common effort keeps the CMS running. Every year about a dozen positions have to be filled. Please have a look at the CMS website (http://www.clays.org/) where all committees are listed, and see where you could contribute best. If you decide that you could help, please let me know.

Finally, you can always come to the society with a new idea, one you think that if implemented would serve the community well, like the Source Clays project or the Reynolds Cup contest. Both these initiatives have had a very positive impact on our field worldwide, and the CMS is the natural vehicle for such initiatives to be realized. If you have a new idea and you feel that we could help implement it, do contact us. Serving your community is not just a good thing to do — it is a rewarding experience.

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President, the Clay Minerals Society

STUDENT RESEARCH SPOTLIGHT

Congratulations to **Sanpreet S. Gill** (Michigan State University, USA), **Bhabananda Biswas** (University of South Australia), and **Ruhaida Rusmin** (University of South Australia and Universiti Teknologi MARA, Mayalsia), and Kath Rothwell (Newcastle University, UK) for winning 2016 CMS Student Research Grants!

Sanpreet Gill examines how bentonite and chabazite could be used to recover N and remove pathogens in urine-derived fertilizer products. Urine contains 80% of the N and 50% of the P in municipal wastewater, yet accounts for only 1% of the total wastewater volume. Urine can be captured using urine separation systems and used as a fertilizer, thereby increasing the recovery of N and P and reducing nutrient pollution in water bodies. Obstacles for adopting urine separation systems include urine storage, transport, spreading urine on fields, and the possibility of urine being contaminated by pathogens and pharmaceuticals. Adding affordable and abundant minerals such as clinoptilolite, bentonite and chabazite to urine separation systems will allow a better recovery of the N and P nutrients and will remove any pathogens from urine fertilizers. The use of such low-cost technologies can aid in closed-loop sanitation systems, reduce dependence on industrial fertilizers, and improve the lives of people around the globe.

Bhabananda Biswas studies the microbial degradation of environmental contaminants in synergy with clay and modified clay minerals. The remediation of organic contaminants, such as polycyclic aromatic hydrocarbons (PAHs), is often limited by the poor bioavailability of these compounds and the inefficiency of microbial degradation in soils and sediments. Using a multidisciplinary approach that combines clay mineralogy, microbiology, and environmental science, Bhabananda examines the compatibility and synergy of potential PAH-degrading microorganisms with different modified clay products (e.g. organoclays) and applies this synergy to remediate PAHs from any contaminated soil and water. The CMS grant allowed him to use microscopic and metagenomic techniques to investigate the effect of organoclays on the functional and diversity changes in native soil microorganisms.

Ruhaida Rusmin is investigating whether Australia's palygorskite clay minerals can be used as potential adsorbents to remove lead (Pb) from aqueous solutions. She modifies palygorskites through chemical activation and the incorporation of biopolymer chitosan and superparamagnetic iron oxide nanoparticles; she then tests whether the modified clay can remove Pb from water. If successful, her modified clay techniques could be used for water remediation. She integrated spectroscopic and microscopic approaches to examine the textural evolution and the interaction with Pb of the modified palygorskites. The CMS Student Research Grant allowed her to use multiple scientific facilities within Australia to characterize the clays.

Kath Rothwell studies redox processes at the clay mineral-water interface and how these processes facilitate organic contaminant transformation. She evaluates the reactivity of iron-bearing clay minerals and representative inorganic and organic components of sediments and soils. She has studied how aqueous Fe(II) and complexes of Fe(II) and organic ligands representing natural organic matter affect the reactivity of Fe-bearing clay minerals towards nitroaromatic probe compounds. The funds, provided by the CMS research grant, will allow Kath to investigate how microbial exudates, acting as chelating ligands and electron shuttling moieties, affect clay mineral redox reactivity. Kath is eager to bridge the gap between laboratory and field based data, to explore emerging properties of real-world systems, and to highlight the importance of clay minerals for contaminant transformation.

CMS MEMBERSHIP RENEWAL

Don't forget to renew your membership for 2017!