

# The Clay Minerals Society

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## THE PRESIDENT'S CORNER



Earlier this year, the Executive Committee of CMS was very pleased to grant Jim Aronson of Dartmouth College permission to make a DVD of a video of the Pioneer Lecture delivered in 1993 by Linus Pauling at the annual meeting of the Society in San Diego (USA). Jim wanted to make copies of the DVD for use in teaching an advanced undergraduate course to his students. I did not participate in the 1993 meeting myself but I have often heard it mentioned at the

Society's annual meetings as this Pioneer Lecture is clearly etched in the memory of those who heard it. The Pioneer Lecturer is chosen by the local organisers of the Society's annual meetings, and it was Dick Berry who invited Linus Pauling to deliver the 1993 lecture. It was an inspired choice and the lecture clearly inspired those who heard it – many felt privileged to have heard this wonderful scientist deliver what turned out to be his last public lecture as he died the following year. I am sure that you will find Jim's article on these CMS news pages interesting, and it is gratifying to know that today's geology students can still be fascinated by a lecture delivered by a 92-year-old pioneering scientist at a CMS meeting 17 years ago.

Anyone wishing to purchase a DVD of this wonderful lecture can order it using the link <https://cms.clays.org/publications.html>. The lecture is the last item listed under "Audio Visuals."

**Derek Bain**, President, The Clay Minerals Society  
The Macaulay Institute, Aberdeen, UK  
[d.bain@macaulay.ac.uk](mailto:d.bain@macaulay.ac.uk)

## LINUS PAULING – AN INSPIRATION

I just finished teaching a brand new course in Earth sciences at Dartmouth College, which I called Mineralogy and Earth Processes. Our goal was to examine the transformations of minerals that occur in various Earth processes, such as weathering, diagenesis, and metamorphism. The course culminated this March with a 5-day traverse across the central Appalachians, where we viewed in their natural geologic context practically every rock type and most minerals that we discussed in class.

We used the phyllosilicates for in-depth study of their mineral chemistry and structure, and showed how we (and nature!) can build each one—for example, gibbsite, kaolin, pyrophyllite, muscovite, and my favorite, trioctahedral lepidolite, as well as the related clay minerals. I emphasized model-building and used the beautiful "TOT" cardboard coordination models (two tetrahedral sheets about the octahedral sheet) I had bought from students of previous classes who had built them from the guide in the text by Dewey Moore and Bob Reynolds. Over and over again I emphasized Linus Pauling's contributions, starting with his very early (about 1930) determinations of the crystal structures of the micas and chlorite. We spoke about his Nobel Prize (1952) for elucidating the nature of the chemical bond, and I related our study of the periodic table and the chart of the nuclides to his great humanitarian contributions in bringing about the international ban on atmospheric atomic bomb testing. We briefly talked about Pauling's later major contributions in which he worked out the structure, including the first helical ones, of complex crystallized macroorganic molecules. Indeed a photo of the 1962 Nobel Prize awards ceremony made it apparent that X-ray diffraction was a central theme in the awards to Watson, Crick, and Wilkins in medicine (unfortunately Rosalind Franklin had died); to Max Perutz in chemistry for providing the first



Victor Drits, Jo Eberl, Linus Pauling, Dennis Eberl, and Paul Nadeau at CMS San Diego, 1993

crystal structure of a protein (hemoglobin); and to Pauling (Peace prize)—all of them followed in the footsteps of Pauling, who possessed an uncanny knack for fitting atoms of a certain size, valence, and bonding mode into crystal structures using mental and real physical models.

One highlight of my course was to show the class my copy of The Clay Minerals Society's 1993 video of Linus Pauling's last public lecture. It was with great admiration that I could say it was The Clay Minerals Society who invited him to their annual meeting in San Diego to be their featured banquet speaker and deliver the Pioneer Lecture. What a fabulous idea, and how appropriate to match the Society with the speaker. He was 92 years old and here he was coming to our Society, which could basically trace its roots to his initial crystal-structure discoveries at Caltech (we learn on the video about his personal very humble beginnings at the Oregon School of Agriculture). Here was this extremely vigorous gentleman with a wonderful sense of humor looking pretty much as I remembered him when I was a graduate student at Caltech 50 years ago. The class got the impression that the honor was mutual, and he appreciated going back to his own roots in delivering this talk. The first quarter of the video was on Society business, which I fast-forwarded, but not without pointing out the intimate nature of this special, welcoming society. The first part of Dr. Pauling's talk was about his determinations of some of the first crystal structures of inorganic compounds—it was a major effort for him to grow sufficiently large, near-perfect crystals of these compounds. The latter part of the video focused on his determinations of the structure of the micas, about which the students were now pretty good experts. Dr. Pauling showed slides, many of them hand-composed, overhead-type drawings. If there was any sense of his age, it was that he himself could not see his own slides. Notably he used multiple "I-beam" TO and TOT columns in his slides as short-hand cartoons to symbolize the various phyllosilicate structures, just as we did in class. We wondered out loud if he was the one who invented that.

It was particularly gratifying to point out to these budding Dartmouth geologists that among the several CMS officers sitting up front beside Dr. Pauling at the podium was the distinguished clay mineralogist Dennis Eberl, who about 45 years ago sat as a Dartmouth undergraduate, possibly in that very classroom. And the gentleman next to Dr. Pauling on the right of the podium was Dennis Eberl's Dartmouth professor, Bob Reynolds. I could point to Bob's photo on display alongside the photos of all the Dartmouth professors of the past.

Looking back, we owe a great deal of thanks to those past CMS officers who planned the 1993 meeting, and in particular to Dick Berry, the meeting organizer, who had such bold insight inviting Dr. Pauling. It was an opportunity for us to thank Dr. Pauling for all he gave us through his pioneering discoveries. Watching the video, it gave me pleasure to see his vigor and genuine enjoyment in being at the annual meeting of our CMS.

**Jim Aronson**, Dartmouth College  
Hanover, USA

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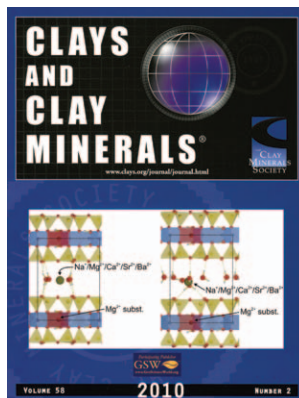
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### CONTINUOUS/FAST-TRACK PUBLICATION

Readers of and authors in *Clays and Clay Minerals* will be interested to know that we have now deployed an early-publication system for the electronic version of our journal (on both the GSW and Ingenta platforms). In practice, what this means is that shortly after a paper is accepted, it will be published online and will no longer have to wait, sometimes for six months, while a suitable paper issue is being prepared. In addition, the editorial team is working very hard to reduce review times. Everyone can help with this by turning reviews around in the agreed three-week time frame. Login to the online journals through the CMS website: [www.clays.org/JOURNAL/CCMgsw.html](http://www.clays.org/JOURNAL/CCMgsw.html).



# Sociedad Española de Mineralogía

[www.ehu.es/sem](http://www.ehu.es/sem)



The Geominero Museum is located next to the Madrid School of Mines, where the SEM-2010 meeting will take place. A guided visit to the museum is scheduled within the activities of the meeting. The museum belongs to the Spanish Geological Survey (IGME) and houses historical material and samples related to the paleontology, mineralogy, and mining history of Spain. Worth noting is the collection of samples gathered by the middle of the 19<sup>th</sup> century during the first production of the geological map of Spain, published in 1848. The construction of the building, which is also the headquarters of IGME, started in 1921 and finished in 1940. PHOTO COURTESY OF IGME

**The Mineralogical Society of Spain will hold its annual meeting in Madrid from September 13 to 16, 2010.** The meeting will consist of a one-day workshop on September 13, scientific sessions on September 14 and 15, and a one-day field trip on September 16. The theme of the workshop will be "Biominerals and Biomineralization Processes." The workshop will be addressed mainly to young researchers and will include lectures by Erika Griesshaber (Ludwig-Maximilians University of Munich), Concepcion Jimenez-Lopez (University of Granada), Paolo Montagna (Columbia University), Alberto Perez-Huerta (University of Alabama), Alejandro Rodriguez-Navarro (University of Granada), and Wolfgang W. Schmahl (Ludwig-Maximilians University of Munich). The scientific sessions will cover topics of interest to those working in crystallography, mineralogy, petrology, and geochemistry. The following session topics have been proposed: biomineralization, applied mineralogy and mineral deposits, mineral-water interaction, mineralogy and environment, and preservation of stone-based cultural heritage. The scientific sessions will be opened by plenary lectures. The confirmed speakers are Lia Addadi (Weizmann Institute of Science), Santiago Leguey (Autonomous University of Madrid), David Millward (British Geological Survey), and Mercedes Suárez Barrios (University of Salamanca). We are expecting about 30 participants in the seminar and more than 150 delegates at the scientific sessions. The meeting will end with a field trip to mineral deposits in northern Madrid. More details and forms for abstract submission and registration are available on the meeting website, [www.ucm.es/centros/webs/se5092](http://www.ucm.es/centros/webs/se5092).