CMS News

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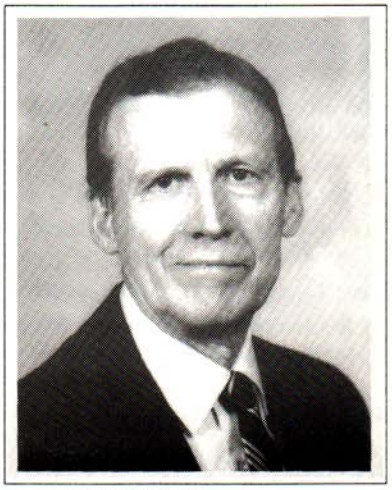
Bailey family endows new award

The children of Sturges W. "Bull" Bailey have endowed a new CMS award in his honor, the Bailey Award. A few months before his death in 1994, Bull, one of the most beloved and distinguished members of The Clay Minerals Society, had expressed his intention to fund the award. His children, Linda Bailey and David Bailey, generously decided to carry out his plan and donated $40,000 to the CMS in order to do so.

Bull's intent was to honor "excellence in clay research." He wasn't sure whether the new award would replace the Distinguished Member Award, but in a letter to then-President Rossman Giese, he said, "I believe it is important that the high achievements of previous Distinguished Members and the honor of their election to the award not be denigrated by whatever change is made." Agreeing with this sentiment, the CMS Council, in establishing the award, has decided that the Bailey Award will replace the Distinguished Member Award, and that past Distinguished Members will receive a certificate identical to the Bailey Award certificate. In other words, the Distinguished Member Award has become the Bailey Award.



Sturges W. "Bull" Bailey

Bull originally wanted to name the award after his wife Marilyn J. Bailey, but reconsidered and thought his name should be included as well. In the end, the award will be called the Marilyn J. and Sturges W. Bailey Award.

Procedures surrounding the Bailey Award will differ from that of other CMS awards. Nomina-

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News of the 1997 CMS-AIPEA Meeting held in Ottawa will be included in the next issue of *CMS News*.

CMS establishes new program for student travel grants

Feeling strongly that attracting bright and enthusiastic students to the Clay Minerals Society is essential for the long-term vitality of the Society, the CMS Council decided to establish a student travel grant program. The Society will budget $1000 per year plus an additional $1000 per year to match member contributions to the Student Travel Grant program. **Members who wish to donate money to the program may send it to the Society Office in Boulder.** It is hoped that as many as six travel grants of $500 each will be made available.

The grants can be used only to travel to CMS annual meetings to give a paper. All CMS student members are eligible to apply for a grant except those currently using funds from a CMS research grant. For more information, please contact Jo Eberl at the Boulder office. Grant applications are due March 1, 1998.

Grant Application Deadlines

Student Travel Grant application deadline is **March 1, 1998.** Next year this deadline will be a month earlier. ***Student Research Grant*** application deadline is **April 1, 1998.** Applications are available from the CMS Office, P.O. Box 4416, Boulder, CO 80302 USA.

Inside ...

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http://shadow.agry.purdue.edu/clay/claymin/claymins.html

Letters

Call for Bailey Award Nominations

The Bailey Award is the highest award of the Clay Minerals Society for scientific eminence as represented primarily by scientific publication of outstanding original research in clay science. Clay science is broadly defined for the purpose of the Bailey Award. Service to the Society, teaching and administrative accomplishments are not to be considered. The award is open to persons of all ages, nationalities and careers. Technical contribution to clay science is the sole criterion for the award. The award is not restricted to Clay Mineral Society Members. Previous recipients of the Clay Mineral Society Distinguished Member Award are not eligible.

Nominations should be accompanied with a letter of support, citing a list of important publications, and a narrative outlining the nominated individual's research contributions. Supporting letters of citation are also welcome. Nominations will remain anonymous and must originate from a Clay Minerals Society member in good standing. All documentation should be sent directly to the Chair listed below. The deadline for nominations is March 15, 1998.

Dr. Paul A. Schroeder
Bailey Award Committee Chair
Department of Geology
University of Georgia
Athens, GA 30602-2501 U.S.A.

phone: (706) 542-2384
FAX: (706) 542-2425
e-mail: schroe@gly.uga.edu

The next issue of *CMS News* will be published soon. Please send any information or articles you would like included to the Society Office as soon as possible.

Archives Thanks

Thanks to Walter Keller, who recently cleaned out his office, Bob Hall, Jessica Elzea, Ken Towe, and Dave Pevear for contributions to the archives.

To join the CMS listserver:
send an e-mail message to:
listserv@vm.cc.purdue.edu,
and write a message as follows:
SUB CLYMIN-L John Doe (replace name with your own).

CMS home page: http://shadow.agry.purdue.edu/clay/claymin/claymins.html

Thanks...

To the following people who contributed to this issue:

David Applegate
Derek Bain
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Lisa Heller-Kallai
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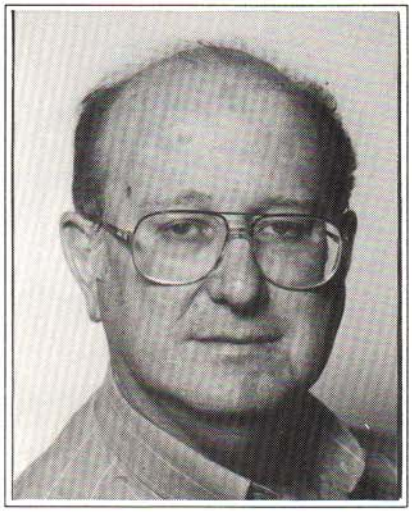
Blair Jones
Bruno Lanson
Shlomo Nir
Dave Pevear
Rich Pollastro
Don Scafe
Paul Schroeder
Christine Shriner
Matthew Srodon
Semeon Tsipursky
Lynda Williams
Isao Yasutani

Leon Margulies 1943-1997

Leon Margulies received his first degree in chemistry from the University of Buenos Aires, Argentina, in 1967, and his M.Sc. (1970) in organic chemistry and Ph.D. (1975) in physical chemistry from the Weizmann Institute, Rehovot, Israel. After a period of postdoctoral fellowship at the Max-Planck Institute for Biophysical Chemistry in Göttingen, he accepted a position of Scientist and later Senior Scientist at the Weizmann Institute. Since 1980, he became Senior Scientist and later Senior Lecturer and Associate Professor at the Hebrew University of Jerusalem, Faculty of Agriculture, Seagram Center for Soil and Water Sciences. He became Chairman of the Department in 1995. In the years 1987-1989, he was President of the Israel Society for Clay Research, and since 1993 he was a Council Member of the International Association for the Study of Clays (AIPEA).

Leon devoted his expertise in the use of several advanced procedures of physical chemistry to basic and applied research on clays. His pioneering work included the development of clay-based formulations which protect pesticides from photodegradation



by co-adsorbing them to the clay with certain organic dyes. Photostabilization of the pesticides was achieved by the mechanism of energy transfer. Another aspect of the research was the reduction of volatilization of herbicides to the atmosphere. A recent successful application was the preparation of a clay-based formulation, which significantly reduces leaching and migration of hydrophobic herbicides by adsorbing them on a clay preadsorbed with an organic cation that interacts strongly with the herbicide molecules. Such a formulation of alachlor (recently patented) has been shown by a bioassay and field experiments to be very effective in reducing leaching while enhancing the biological activity. The implementation of Leon's ideas for clay-based formulations would significantly reduce the amounts of pesticides required and help to protect the environment.

Leon's knowledge and aptitude were greatly appreciated by his colleagues and students who benefited from his lectures. He was a person of high integrity who created a pleasant and friendly atmosphere in his contacts with colleagues, students and visitors. He believed in international cooperation and in active pursuit of peace. His collaborators included scientists from Spain, France, Germany, Egypt, Jordan, and Gaza. He also guided the Ph.D. work of a student from Gaza. He initiated and organized an Israel-Spain conference and just lately an Israel-France workshop, which focused on basic research and application of clays.

He is survived by his wife, Julia, and his children, Sharon, David, and Maya. His sudden death is a great loss to his loving family, colleagues and students.

Sholomo Nir, Rehovot, Israel

CMS Student Research Grants

Purpose: The research program is designed to provide partial financial support of masters and doctoral research for graduate students of clay science and technology.

Selection: Applications will be judged on a competitive basis. The qualifications of the applicant, the financial need of the research project, and the design of the research project shall be considered. Applicants selected will be nominated by a five-member CMS committee and approved by the CMS Council. Members and nonmembers of the CMS are eligible. Students from all countries are eligible to apply.

Application: Each applicant must complete an application for research grant form (available from the CMS Office) and must obtain confidential evaluations from two faculty members at his or her university. Use the applicant appraisal form provided with the application.

Use of Funds: Individual grants will not exceed $2,500. Grant money may be used only for the costs of travel by the grantee to conduct research, for room and board associated with research-related field work, or for the costs of equipment, supplies, and analyses required to complete the research, with the exception of up to $500 for expenses incurred while presenting a paper at the CMS conference on thesis research. Recipients can apply for grants on subsequent years. Application forms and appraisals (7 copies) must be postmarked by April 1, 1998, and sent to the Society Office.

Interviews with the clay scientists

Lisa Heller-Kallai

Drawing by Mateusz Srodon

Lisa Heller-Kallai is a professor in the Department of Geology at the University of Jerusalem (retired since 1994) She is a long-time member of the CMS and a past President of AIPEA. The interview was conducted by Dennis Eberl and Jo Eberl in Strasbourg, France, in 1992, and continued in Boulder, Colorado, in 1994. Additions were made in 1997.

CMS: How did you get into clay mineralogy?

HELLER-KALLAI: I drifted into it. When I came to Israel, there was nobody doing it. I had worked on calcium silicates, so it wasn't such a big change.

CMS: You got your Ph.D. at Oxford?

HELLER-KALLAI: No, at London University. My first degree was from Oxford.

CMS: Was it unusual for women to go to Oxford? I thought it was a men's school.

HELLER-KALLAI: Not entirely. At the time there were four women's colleges, but well over twenty for men.

CMS: And you studied there as an undergraduate with a Nobel Prize-winning chemist?

HELLER-KALLAI: Yes, I was fortunate to have Dorothy Hodgkin as my tutor. The system at Oxford was that the degree in chemistry was divided into Part 1 and Part 2. Part 1 was general, with lectures and tutorials, and Part 2 was research work. Dorothy was my tutor for Part 1, and I did some of Part 2 in her lab.

CMS: Do you think you learned a lot about science from her? Did you have a lot of contact?

HELLER-KALLAI: Yes, we had frequent contact, starting with a weekly tutorial, and I certainly learned a lot from her.

CMS: We understand that you went to college with Margaret Thatcher.

HELLER-KALLAI: She was a year ahead of me.

CMS: She visited you when she was in Israel?

HELLER-KALLAI: Not exactly, she didn't exactly visit me. I think I was used for local color during her official visit to the University.

CMS: Well, since you were friends with Maggie Thatcher, what happened to this chemist who suddenly got into power and cut science budgets all across Great Britain?

HELLER-KALLAI: I have no idea. I really don't know.

CMS: Do you think it was a good thing, maybe to shake science up?

HELLER-KALLAI: Most of my contacts in Britain are with scientists, and none of them seems to think it was a good thing. So I am influenced. I suppose science is always in need of a shake-up, but I doubt whether this was the best method.

CMS: Was she hostile to science when you knew her?

HELLER-KALLAI: That's what scientists in Britain

Heller-Kallai, *continued*

think, but I really don't think so. After all, she studied chemistry then.

CMS: How good a chemist was Maggie Thatcher?

HELLER-KALLAI: I have no way of judging. I don't remember ever discussing chemistry with her. On the occasions when we did meet, we talked generalities, or she tried to convert me to the Conservative Party. She was a very active member of the Oxford University Conservative Society.

CMS: Her conversion attempt was unsuccessful?

HELLER-KALLAI: Unsuccessful.

CMS: Why did you go to Oxford?

HELLER-KALLAI: Because I got a scholarship. At that time it was very competitive for women to be accepted by one of the high-ranking universities. So the usual procedure, particularly for students dependent on scholarships, was just to try various universities. Oxford offered me the highest paid scholarship.

CMS: You've done a lot of recent work on clay volatiles. Can you tell us about these volatiles? I understand you can get some very unusual substances coming from clays when you heat them. I guess Keller is also doing some of that work.

HELLER-KALLAI: There is a slight difference between Keller's work and ours. Keller heated the clays, condensed the gases, and looked at the condensed material. I think his main aim was to use the composition of these condensates to learn something about the geologic history of the samples. We looked at the volatiles as well as at the condensed material, and there is a difference. Our emphasis was on the reactivity of the material and on what these volatiles and condensates can do to surrounding minerals or organic matter. And not only to the immediate surroundings, because the reactivity is preserved over periods of years, at least, and volatiles can therefore have an effect at some distance from their source material.

CMS: What sort of substances are you getting off, and what sorts of reactions?

HELLER-KALLAI: You name it, we get it. Anything—a surprising range of material. But I must say that we're not absolutely sure what we're actually getting off, because some of the material may be altered in the process of the analysis, either in the mass spectrograph or in the process of condensation. Nevertheless, we are certain that we get a great variety.

CMS: What are some of the things you've detected?

HELLER-KALLAI: Apart from the more usual ones that you might expect, such as HCl, all kinds of nitrogen compounds, phosphorous compounds, hydrogen, strange things like azides.

CMS: What sort of reactions have they caused?

HELLER-KALLAI: The reactions we have looked at closely are decomposition of carbonates, calcite in particular, and cracking of hydrocarbons. We also looked at the reactions with some complex organic material, such as proteins. With these complex molecules we can only say that volatiles do cause a change, a fingerprint sort of thing. We also experimented with quartz, feldspars, and zeolites, and they, too, were affected by volatiles or condensates. So you see, we are dealing with pretty reactive stuff!

CMS: It sounds like these could be important for oil generation.

Our emphasis was on the reactivity of the material and on what these volatiles and condensates can do to surrounding minerals or organic matter.

HELLER-KALLAI: We certainly think they could be.

CMS: They could actually crack the hydrocarbons?

HELLER-KALLAI: They are certainly able to do so. They act as acid catalysts. I think we have established that beyond doubt. The question is one of quantity.

CMS: They also could be involved in dissolving rock?

HELLER-KALLAI: Yes, they could dissolve carbonates and attack silicates and therefore ease oil migration by increasing the permeability of the rocks.

CMS: What acidity could you get out of the clays, for example, for a given weight of clay?

HELLER-KALLAI: It depends very much on the clay;

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Heller-Kallai, *continued*

volatiles are very sample specific. We have measured pH's of condensates evolved from various clays at different temperatures. They range from pH 1 to 10. In the temperature range of the dehydroxylation of the clay, the pH of the condensates tends to be low.

CMS: How do you think the volatiles are bound to clays? We learn the structural formulas for clays, and there doesn't seem to be any room for volatiles.

HELLER-KALLAI: I think some of the anions, like F or Cl, may be structural and come off as halogen or, in combination with protons, as an acid. The rest are adsorbed in some form, perhaps like minute fluid inclusions or perhaps simply adsorbed on external or internal surfaces. But it's really something we don't know. What we do know is that some of them are very firmly held and are only released at fairly high temperatures.

CMS: I think that these recent discoveries that you've been making have been really almost revolutionary, the effect of volatiles on catalysis.

HELLER-KALLAI: It's so revolutionary that nobody wants anything to do with it.

CMS: Nobody wants to publish it?

Volatiles could dissolve carbonates and attack silicates and therefore ease oil migration by increasing the permeability of the rocks.

HELLER-KALLAI: We had difficulties getting some of it published.

CMS: Israel seems to be a fertile ground for clay science. There are so many good soil scientists and clay scientists there. Is this science emphasized in Israel for some reason?

HELLER-KALLAI: We had some very active groups, and that is probably infectious. Also for a period, agriculture, and therefore soil science, was a top priority. At present, attention is focused on other things, and interest in clay science has declined. Also the emphasis is more on applied than basic research.

CMS: I know there is a Seagram Centre for Soil and Water Science there. Is it a prominent scientific institute, would you say?

HELLER-KALLAI: Yes. It belongs to the Hebrew University. They do a lot of interesting research there.

CMS: Do you think that clay research has contributed at all to practical matters in agriculture, or is it more academic?

HELLER-KALLAI: I suppose it is more academic, but some of the results have certainly been applied, for example in the development of pesticides.

It's so revolutionary that nobody wants anything to do with it.

CMS: I guess the big contribution that I know about is the drip agriculture which has been perfected in Israel.

HELLER-KALLAI: That is not directly connected to clay research. However, I was indirectly associated with it, because one of my sons, who has a degree in agriculture, marketed the equipment in the U.S. for several years, together with the know-how.

CMS: You know some of the top clay people in Israel, I guess. Maybe you'll get into trouble if you forget to mention any of them.

HELLER-KALLAI: I think I can safely say I know all of the senior clay scientists in Israel.

CMS: Do you want to get yourself in trouble and comment on their work?

HELLER-KALLAI: No, I'd rather not. I believe that they are doing good work. I really do think we have a good group. It's partly dispersing now, because people are going in different directions.

CMS: There's Shainberg. Is he in Israel now? He's working on ion exchange?

HELLER-KALLAI: He's working on the physical chemistry of ion exchange, yes, among other things. He's been working on that for many years, but in recent years we saw very little of him at our clay conferences

Heller-Kallai, *continued*

CMS: Then there's Lahav. What is he working on?

HELLER-KALLAI: He's working on many subjects. He studied pillared clays and clay dispersion. His main interest in recent years is the origin of life.

CMS: Let's see, there's Singer.

HELLER-KALLAI: He is quite prolific. He has worked on syntheses, diagenesis, stability diagrams, and more.

CMS: Banin. I think right now he's most interested in clays on Mars.

HELLER-KALLAI: Yes, that is quite a challenge, as there are absolutely no samples to work on.

CMS: Well, remote sensing.

HELLER-KALLAI: Yes.

CMS: And there's Yariv. What did you think of his book on colloid science?

HELLER-KALLAI: I enjoyed it, but then I was very close to its birth. At the time he wrote it, we cooperated quite a lot, not on the book, but on some research projects. So I feel connected, although I did not participate.

CMS: Has the war, the difficult political situation, affected science in Israel?

HELLER-KALLAI: Of course, it affects all of us emotionally in some way, and therefore it affects science. It affects the research budget, because of the great expenditure on defense. For the younger men it involves reserve duty in the army, and for older people it means worry about children or grandchildren in the army. I'm sure that in periods of tension we don't work as well as we do when we are relaxed.

CMS: During the Gulf War, what happened down at the university?

HELLER-KALLAI: The same as elsewhere. Everything shut down for a time.

CMS: So no one went to work?

HELLER-KALLAI: No one went to work except for essential services.

Lisa Heller-Kallai in Strasbourg, 1992. *Jo Eberl*

CMS: Is there a lot of money for defense research?

HELLER-KALLAI: Defense budget, yes, not necessarily defense research.

CMS: What is the most important work that you've done?

HELLER-KALLAI: It's hard to say because the perspective changes. At the moment I think it's volatiles. It is probably always the current work. I think that our studies on the importance of protons, including structural protons, on various reactions of clays were important. Perhaps one of my contributions was to help in getting clay science on its feet in Israel.

War affects all of us emotionally in some way, and therefore it affects science.

CMS: You did a lot of work with IR?

HELLER-KALLAI: Yes, at various stages. Also Mössbauer spectroscopy, but I think that one should always emphasize the problem studied rather than the method used.

CMS: Ion exchange?

HELLER-KALLAI: Perhaps ion fixation rather than ion exchange. Also organo-clay reactions, which involved exchange with organic cations including model substances for pesticides.

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Heller-Kallai, *continued*

CMS: There are two schools of thought in soil science. One is that you should take the soil and experiment with that, and the second is that you should work with model substances, but people who work in soils claim that you can never understand soil systems. What do you think?

HELLER-KALLAI: Well, I haven't much experience with soil as such, but it probably works both ways. It depends on what you want to do, because I think you cannot start with something as complex as soil and hope to understand the processes. On the other hand, I suppose it's dangerous to extrapolate from model substances. You probably have to attack the problems from both directions, rather like digging a tunnel from both ends, hoping to meet somewhere mid-way. Your starting point will depend on whether your interests are more in the applied or in the basic aspects.

CMS: Have you found any advantages or disadvantages to being a woman in the scientific field?

HELLER-KALLAI: No, I always tried to keep gender apart from science. Early on in my scientific career one of my (male) colleagues said: "In the lab there are no ladies, only female research workers." I have always accepted that.

I think that one should always emphasize the problem studied rather than the method used.

CMS: They dedicated an issue of *Clay Minerals* to you. What do you think about that?

HELLER-KALLAI: Also an issue of *Thermal Analysis*. I was very surprised. I think it was rather exaggerated.

CMS: There must be a reason.

HELLER-KALLAI: If there is, it escapes me. It reminds me of Mark Twain's comment, "The report of my death was an exaggeration."

CMS: Well, at least it's not a memorial issue. They also dedicated a meeting to you. What was that?

HELLER-KALLAI: The 1991 meeting of the Israeli Clay Society.

CMS: So again, it's the same thing. Maybe someone's planning on getting rid of you.

HELLER-KALLAI: No hope yet.

CMS: What do you see as the main lines of future research in your field or related fields in clay science?

HELLER-KALLAI: Well, personally I'd like to see volatiles coming into their own, and see the ramifications of that work. In general, I suppose that we should attack some of the environmental problems, putting clays to better use.

CMS: You're working now at Jerusalem University, and you're on the faculty in the Department of Geology?

HELLER-KALLAI: Yes, but officially retired since 1994.

CMS: It seems as though geology is moving more towards environmental science.

HELLER-KALLAI: Yes, I think so, and also towards oceanography.

CMS: How is your funding? Is it a problem?

HELLER-KALLAI: Yes, it is very problematic. It always was, but now it's particularly so. We are dependent on grants, not for our salaries, but for any work we do. And grants are hard to come by. The teaching budget has also been drastically cut.

CMS: So you're always putting in for a grant. To whom do you apply for grants?

HELLER-KALLAI: We apply to the US- Israel Binational Fund, to some European Community funds, to our local Academy of Science, to the government, or, for small grants, even to internal funds of the University. The competition is very keen and funds are limited. But funding seems to be getting harder worldwide.

CMS: Do you have a lot of students who are coming into geology?

HELLER-KALLAI: It varies, but the average has been fairly constant over the past few years. We never have large classes in geology, just about fifteen students per year. We are a small country.

CMS: Are your students able to find jobs?

Heller-Kallai, *continued*

HELLER-KALLAI: It's difficult.

CMS: What do they end up doing usually?

HELLER-KALLAI: If they're lucky, they get a university job or go to the Geological Survey, to the Institute of Geophysics, to one of the oil companies, or even to private consulting firms. There isn't much mining, but occasionally there is a job going. There are cement factories, the Dead Sea Works, Periclase, and others. Or they go into environmental studies or teaching. A few leave the field altogether.

CMS: Did you teach?

HELLER-KALLAI: Yes.

CMS: What classes did you teach?

HELLER-KALLAI: Mainly mineralogy and instrumental methods.

CMS: What sort of things did you teach in your clay course?

HELLER-KALLAI: Basic clay mineralogy and structural chemistry, analytical techniques, geological applications.

Usually, in the process of working on a problem, something puzzles me and I start to look deeper. I believe that if you look carefully, you always find such problems, however routine the work appears to be.

CMS: How do you view clay science? Is it an independent science?

HELLER-KALLAI: That depends on how you define a science. I think you can regard clay science as a nucleus, but you have to be very broad in your choice of subjects to include.

CMS: Can you describe the scientific process as you experience it—how you make a discovery, or how you work on a problem?

HELLER-KALLAI: Mostly it starts with some sort of observation or something which suddenly tricks interest. I don't sit down and think, "I really must start researching this particular phenomenon." Usually, in the process of working on a problem, something puzzles me and I start to look deeper. I believe that if you look carefully, you always find such problems, however routine the work appears to be.

Lisa Heller-Kallai and her husband Zechariah touring Alsace, 1992.
Jo Eberl

CMS: How did you get into clay volatiles?

HELLER-KALLAI: That is exactly a case in point. We were analyzing oil shales for the very practical problem of trying to extract fossil fuels. In the course of Rock Eval analyses, which are routinely used for evaluating source rocks, we found carbonate decomposition in some oil shales at much lower temperatures than we expected. This was intriguing, and we tried to find the reason. Eventually, by diverse routes, we reached the conclusion that the only reasonable explanation we could offer was the activity of clay volatiles. So we proceeded from there...

CMS: What's your favorite clay?

HELLER-KALLAI: I learned from children and grandchildren that you don't have favorites!

CMS: So we shouldn't ask who's your favorite grandchild. Would you want to talk at all about your childhood, the children's transport, how you ended up in England? You were born in Austria?

HELLER-KALLAI: Yes. Well, after Hitler came to Austria, I was first smuggled across the border into

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Heller-Kallai, *continued*

Czechoslovakia, to my grandparents, and a year later I was sent by children's transport to England. During 1938-1939, 10,000 children aged just above zero up to 18 were rescued by this action, known as "Kindertransporte."

CMS: How did they find homes for you in England?

HELLER-KALLAI: Every child had to have a guarantor, who had paid fifty pounds to the Home Office, as a guarantee that the child would not be a burden on public funds. This could be either an institution, in which case the child would be sent to a boarding school, hostel, or farm, or else a family who would then accept the child into the home. I was sent to a boarding school

CMS: This was done with the Nazis' approval?

HELLER-KALLAI: Yes, the Nazis let the children out. There was an international appeal to rescue the children, but only Britain was willing to accept some.

CMS: What was it like when you got on the train? Did your mother come to say good-bye?

HELLER-KALLAI: No, I hadn't seen my mother for a year at that stage, because I was in Czechoslovakia, and my parents remained in Vienna.

There was an international appeal to rescue the children, but only Britain was willing to accept some.

CMS: Did you leave from Czechoslovakia?

HELLER-KALLAI: I left from Prague, yes.

CMS: Did you take care of any of the children on the train?

HELLER-KALLAI: We were eighty children on the transport, from the age of a few months to nearly eighteen, and only one adult, who did not even speak Czech. So the older children, older being age ten or twelve and up, took care of the younger ones. I shall never forget the mother who pressed her small baby into my arms, together with some diapers and a box of chocolates, and asked me to look after it. I had no idea what to do with a baby and eventually swapped it for a three-year old. I often wonder whether these children ever saw their mothers again. More than eighty per cent did not.

CMS: Was everybody upset?

HELLER-KALLAI: Of course they were upset, but among the children there was also a sense of adventure.

I imagined that when I got to England I would talk to someone, if necessary the King himself, and get my parents out. The trauma came later.

CMS: All of these children separated from their parents—I just can't imagine how difficult that was.

HELLER-KALLAI: I think that the parting was most difficult for the relatives and perhaps for the older children who realized what it implied. For the smaller children, it was frightening, but it was also an adventure, very dramatic. The train left at midnight, and there was a lot of subdued excitement. There were other children, we were on a train, we had a lot of chocolate. The next stage was that we all got very thirsty and had nothing to drink. We had not been allowed to bring drinks. It was a long journey in sealed wagons through Germany into Holland, and we were busy with the smaller children and occupied with our immediate needs. Also I imagined that when I got to England I would talk to someone, if necessary the King himself, and get my parents out. The trauma came later.

CMS: How did you end up in Israel?

HELLER-KALLAI: In Israel, by choice.

CMS: When did you go there?

HELLER-KALLAI: 1953.

CMS: Did you have a job right away?

HELLER-KALLAI: No, but it did not take very long until I started work at the Standards Institute. We lived in the area of Tel Aviv, and the scientific job market there was very restricted. Tel Aviv University did not yet exist. The job did not have much content, and after little more than a year I moved to the Geological Survey in Jerusalem, and ultimately to the Hebrew University in Jerusalem.

Heller-Kallai, *continued*

CMS: Was 1953 when you graduated from the University of London?

HELLER-KALLAI: No, I got my Ph.D. in 1951. I was married to an Israeli, and he graduated in England in 1953.

CMS: Did you have a job in England?

HELLER-KALLAI: Yes. I had a research job when I studied for my Ph.D. at Birkbeck College, University of London, and I was able to continue after getting my degree.

CMS: Have you written any books?

HELLER-KALLAI: Only a monograph on calcium silicates, together with Hal Taylor.

CMS: Was Taylor your advisor?

HELLER-KALLAI: No, he was a senior colleague with whom I worked in London. But in practice I should say he probably was my chief advisor. Hal and I left Birbeck at the same time, and before leaving we summarized our work in the monograph.

CMS: Who was your official advisor?

HELLER-KALLAI: Officially it was Professor Bernal, who was the head of the department. In practice the advisor was Jim Jeffrey, who was the head of our section.

CMS: What did you do your thesis on?

HELLER-KALLAI: On the crystal structure of calcium aluminate and of calcium disilicate hydrate. The sort of thing you do now in a few days with computers.

CMS: Did you have any contact with Bragg or any groups at other universities?

HELLER-KALLAI: Not with Bragg. I heard him lecture at the Royal Society, but I had no personal contact with him. He was an outstanding lecturer. We had contact with a group working on silicates in Cambridge. We also had joint seminars with the crystallographers at University College, London (Kathleen Lonsdale's group), but our main connections were with the people working on Portland cement at the Building Research Station.

CMS: What about Brindley?

HELLER-KALLAI: Actually he was the first one to offer me a job when I graduated from Oxford. But he was in Leeds, and for personal reasons I preferred London. So I took the job I was offered in London. Over the years I had many discussions with Brindley and I visited him at Penn State, but I never worked with him. However, I always regarded him as a friend.

CMS: Who have you worked with?

HELLER-KALLAI: After Hal Taylor, with various people in Israel, particularly Shmuel Yariv, with Robert Mackenzie in Aberdeen, and others with whom I spent time on sabbaticals.

CMS: What was some of the work you did with Mackenzie?

HELLER-KALLAI: Many years ago we studied dehydroxylation of smectites, in cooperation with Colin Farmer and Hal Taylor. More recently we worked on kaolinites and reactions of carbonates with kaolinites. Ultimately this linked up with our work on volatiles.

CMS: Lisa, you're one of the most well-traveled people I know. They're liable to fire you when they find out how much traveling you've done.

Brindley was the first one to offer me a job when I graduated from Oxford.

HELLER-KALLAI: Don't forget, I've had a number of years to do it in, so you see, it's distributed over many years.

CMS: Do you ever travel for fun, or is it always in conjunction with work?

HELLER-KALLAI: I always have fun, but it is often combined with work. I think that's the nicest way of traveling. You have a focus, and then you travel for fun.

CMS: Have you spent extended periods in other places?

HELLER-KALLAI: Yes, in Aberdeen, Versailles, Cambridge, Boulder, and Princeton.

CMS: What came out of those collaborations?

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Heller-Kallai, *continued*

HELLER-KALLAI: Usually a study that was summarized in a publication. It was mostly self-contained, except in Princeton, where I continued work on clay volatiles.

CMS: Did you have a mentor in science?

HELLER-KALLAI: As a young girl I was inspired by Eva Curie's biography of Marie Curie. Later I was greatly impressed by my tutor, Dorothy Hodgkin, and by Dame Kathleen Lonsdale. Both women were great scientists, great humanists, and managed a family life as well. I greatly admired these women. I did not delude myself into believing that I could follow in their footsteps.

CMS: You've worked with a number of prominent people. Dorothy Hodgkin was a Nobel Prize winner. Did she seem like an outstanding person? Was there anything remarkable about her?

HELLER-KALLAI: Yes, we knew that she was outstanding, although she was an extremely modest person, almost self-effacing, but we always knew that she was special.

CMS: What was her contribution?

HELLER-KALLAI: The determination of crystal structures of large biological molecules—insulin, vitamin B12, penicillin.

CMS: What other interesting people have you worked with over the years, would you say? What did you learn from them?

HELLER-KALLAI: The most interesting person was Desmond Bernal, appropriately nicknamed "Sage."

CMS: Was he the optical person?

HELLER-KALLAI: No. He was a crystallographer, but he was interested in many things. He was very much an all-round person, a Renaissance-type of man. He was professor of physics when I was at Birkbeck and later became the only professor of crystallography in Britain. One of his early achievements was the development of the Unicam single crystal camera and the Bernal chart. Later, at Cambridge, he worked on the structure of steroids, on the structure of water, and on other problems. He was very prolific, disseminating ideas for others to follow. He probably had the most comprehensive general knowledge of anyone I ever knew. His personal friends included the greatest thinkers and artists of his time, like Picasso and Paul Robeson. He was also very active politically, with strong sympathies for the Soviet Union, but I knew even then that in this he was mistaken. Nevertheless I admired his motivation and his constant efforts for international cooperation and world peace.

CMS: It seems like crystallography these days is pretty much automated and you don't have to know much about it to determine a crystal structure.

HELLER-KALLAI: That's why many good people have left the field. Because it's becoming too automated.

CMS: You seemed to give up crystallography pretty quickly and go into geochemistry.

HELLER-KALLAI: Well, it just so happened that when I started work at the Geological Survey, there was a need for that. The Geological Survey had not done any work on clays, and the director decided that it was time to do a survey of clays in Israel and, perhaps later, even some research. He was looking for somebody to do clay work, and I was looking for a more interesting job, so that's how it happened. I'd worked on cement components in London and I had used X-rays before, which was more than anyone else had at the Survey.

So I decided on the next best thing, science, and I drifted into chemistry.

CMS: How did you decide to go into science in the first place?

HELLER-KALLAI: It was hardly a decision. My schooling was rather haphazard—from a girls' school in Vienna, which was supposed to turn me into an educated housewife, I moved to a Czech village school, then to a coeducational school for refugees in England, and finally to an English girls' school. This cocktail didn't expose me to much science, except at the last stage, but I always liked mathematics. We had no counseling, so I didn't know what to do with mathematics. I believed that there were only two options, either to teach school or to go into the insurance business, neither of which I found attractive. So I decided on the next best thing, science, and I drifted into chemistry.

CMS: If you had to do it over again, would you still be a scientist?

Heller-Kallai, *continued*

HELLER-KALLAI: I'm not sure. There are so many other things in the world.

CMS: What other fields could you imagine yourself having pursued?

HELLER-KALLAI: Child psychology always attracted me, but I wasn't aware of the possibility. As I said, schooling was somewhat chaotic. It was the period during the war. We had no career counseling, and I wasn't aware of all the possibilities. I thought that you had to do medicine to study psychology, and I did not want to study medicine. But I do not regret the choice I made.

CMS: What are some of your other interests or hobbies, or anything else you're terribly interested in?

HELLER-KALLAI: Children.

CMS: How many grandchildren?

HELLER-KALLAI: Fourteen. That's an interest in itself. Reading, I enjoy reading, I am very interested in art, and I love travelling. I was a keen tennis player, but I gave that up some time ago.

CMS: You don't like to go out in the desert and ride camels?

HELLER-KALLAI: Not the camel part. The desert is all right.

CMS: You were President of AIPEA. Was that a lot of work? What did the job entail?

HELLER-KALLAI: No, the job doesn't entail very much work. All the hard work is done by the Secretary and the Treasurer. They work hard, Presidents don't. I worked very hard when I was Editor of the Proceedings of the conferences in Israel and in Japan. In those days, Volume 1 of the Proceedings, with all the papers, was published before the conference. The idea was to give participants time to read the papers and prepare the discussion, but still have publications reporting most recent work. Papers were accepted in one of the four official languages—English, French, Russian, and German. We had about three to four months to send the papers to referees, select the recommended ones, get them typeset, and distribute the Proceedings. Some of the papers had to be practically rewritten, because there was not enough time to return them to the authors for editing. Another problem

Lisa Heller-Kallai in Strasbourg, 1992. *Jo Eberl*

was that whenever I asked the typesetter for a correction, another mistake was liable to appear in the same row. In the final stages, the printers worked through the nights, and so did I. The discussions were published at leisure after the conference, and that was child's play in comparison.

CMS: What do you see as the future for this organization?

HELLER-KALLAI: It organizes good meetings. I am interested in promoting clay education, which I think should be one of the objectives of the society.

CMS: How do you see promoting clay education?

HELLER-KALLAI: It must be done by individual members. The society can help by providing them with funds and encouragement.

CMS: Scholarships, you mean?

HELLER-KALLAI: Not necessarily scholarships, but helping members who want to develop programs, education programs, computer programs, and so on.

CMS: The dues are so low in AIPEA, I wonder how they can afford to do something like that.

HELLER-KALLAI: The society seemed to have some money in the past. Usually at the meetings, they collect enough money to run the meeting and have a little to

continued on next page

Heller-Kallai, *continued*

spare. I don't think that a society like ours needs much money. Perhaps I have a distorted view of what's considered a lot or a little money, but I think that it is important to keep the membership fee low, so that it does not become an obstacle to joining. It seemed to me that AIPEA had enough money to do what it needed to do.

CMS: Well, to fund scholarships, things like that.

HELLER-KALLAI: We're not talking about scholarships. I was thinking more of teaching aids and things of that sort. You don't need lots of money for that. The Clay Minerals Society is supporting scholarships effectively, as they have more money. If the international organization has money to spare, it should do so, but I think that it is more important to keep the doors open for all than to provide a scholarship or two. There was an attempt, not a very successful one, to distribute standard clay samples to various laboratories, in an effort to standardize analyses. Things of that sort could certainly be done. It doesn't even take much money, only some effort.

CMS: There was a program started by Thorez, wasn't it? And he found that every lab gave him a different answer to what was in the sample?

HELLER-KALLAI: Yes, ranging from one component to, I think, thirteen or so for the same sample.

CMS: By X-ray, you mean?

HELLER-KALLAI: By different methods, including a standard X-ray procedure to be followed by all and then supplemented by anything anybody wanted to do. The results, as I said, ranged from one to thirteen components, so something remains to be done!

CMS: So you're trying to say that our science is not based on reliable data.

HELLER-KALLAI: Unfortunately it is not always too precise, if these results are anything to go by. I think you can under-interpret and over-interpret. Both happened here.

CMS: Did you attend all the AIPEA conferences.?

HELLER-KALLAI: Yes, I was fortunate. Some I attended *ex officio*, others just as a run-of-the-mill participant.

CMS: It would be nice if students could be supported somehow... and scientists who can't afford it. I don't know how it can be done.

HELLER-KALLAI: Well, for that, of course, you need a lot of money. And then you always run into the problem with some countries that, on principle, will not fund their scientists, and then they get the money and cut out everybody else. It's a vicious circle because these countries rely on the fact that international organizations will support their scientists, and this is what seems to be happening. On the other hand, we do not want to penalize the scientists for the policies of their countries.

CMS: Which countries?

HELLER-KALLAI: What used to be the Soviet Union and Eastern European countries. They usually don't provide any money, and this is the burden of international organizations. It has often precluded support to other people.

CMS: Are scientists in Israel paid well?

HELLER-KALLAI: No. If you are talking about the universities, they are paid like everybody else at the university, standardized salaries. But we do get what I consider to be fairly generous travel funds.

CMS: So somebody in the philosophy department will make the same as someone in the sciences?

HELLER-KALLAI: Exactly. It goes by rank and seniority, not subject.

The Soviet Union being such a big country, the training tended to become very specialized, whereas in a small country like ours, this is not always an advantage.

CMS: Are scientists respected particularly in Israel?

HELLER-KALLAI: I don't think so.

CMS: The Jewish culture has always emphasized education, so are teachers paid well?

HELLER-KALLAI: Teachers are paid badly, and that is part of the problem of our educational system. Because they are badly paid, it's very commonly women who are teaching as a second job in the family. They teach be-

Heller-Kallai, *continued*

Lisa Heller-Kallai at the Ottawa banquet, seated between her daughter-in-law, Hadar Heller, and husband Zechariah. *Jo Eberl*

cause they want to have the same holidays as their children and not as a vocation. I really don't want to generalize, because some of them do take it very seriously. But too few regard it as a real career.

CMS: There has been a big influx of Russians, probably a lot of scientists among them. Do you think Israel will be able to absorb scientists into the scientific world?

HELLER-KALLAI: At the moment it looks as if some of them can be successfully absorbed. Among the new immigrants are some highly qualified people, though sometimes perhaps too specialized. The Soviet Union being such a big country, the training tended to become very specialized, whereas in a small country like ours, this is not always an advantage. But they have already made significant contributions to science and mathematics here.

CMS: Does the Israeli government consult with scientists on policies? Do scientists have a strong political say in decisions?

HELLER-KALLAI: There are committees, but I wouldn't say that this guarantees a strong say. Occasionally scientists get into government, but on a political platform, not because they are scientists.

CMS: Your husband Zechariah is a biblical scholar. Does your work at all overlap? Biblical studies and clay mineralogy?

HELLER-KALLAI: My husband specializes in historical geography. He is very interested in geology and geomorphology and therefore in the geological aspect of my work. But the professional overlap is very one-sided, I am afraid. I know very little about biblical studies.

CMS: Have any of your children or grandchildren followed in your footsteps and become scientists?

HELLER-KALLAI: Well, one of my sons did agriculture; but he was interested in the more applied aspects rather than in research. His wife also studied agriculture and is doing her Ph.D. now. None of the others are scientists. Most of the grandchildren are too young yet, but the three that are old enough are not going in that direction.

CMS: Have you advised them not to go into science, but to go into the entertainment field or something?

HELLER-KALLAI: No, but unlike me they knew what options they had. When my daughter-in-law started her Ph.D., with three children and a very busy husband, I warned her that it may be tough going if she wanted to do a good Ph.D.

CMS: You have 15 grandchildren, did you say?

HELLER-KALLAI: Fourteen. As far as I know, it's fourteen.

CMS: It may have changed on this trip.

HELLER-KALLAI: *(added in 1997)* It did not, but it has by now!

CMS: With the ending of the Cold War there seems to be a change in the air for the type of science people do. I think that before, any type of science was supported, maybe because of national pride or whatever. But now, do you think there is a change towards more practical research?

HELLER-KALLAI: I think there has been quite a change towards more practical research, and I think there are a few subjects that are always at the top of the list.

CMS: Like what?

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Heller-Kallai, *continued*

HELLER-KALLAI: I'm not quite sure what the current ones are, but it's certainly not clay mineralogy. Probably ecology.

CMS: Where do you see clay science going?

HELLER-KALLAI: I'm not sure what should be emphasized, but what amazes me over and over again is how little we really know in depth. I think that in clay science more sophisticated techniques are being applied and we're penetrating deeper, but much is still obscure.

CMS: Do you have any advice to young scientists just starting out their studies?

HELLER-KALLAI: Not really, and anyway it wouldn't help. I would just tell them to keep their eyes open and try not to develop preconceived ideas. They all have to make their own mistakes.

This is why Israeli scientists have a reputation for traveling so much. It's the only way not to be isolated, so we try to get around, learn, and establish contacts.

CMS: Do you think different countries have different approaches to science?

HELLER-KALLAI: Nowadays science is so international, I think probably, judging by the literature, not from personal experience, that Eastern Europeans have a slightly different attitude.

CMS: What's their attitude?

HELLER-KALLAI: Attitude is perhaps the wrong word. I think you can usually tell a paper that was written in the former Soviet Union. I think it's very often written differently than one from the West.

CMS: Maybe it doesn't show any data.

HELLER-KALLAI: It shows less data; I think it's a little more wordy; there seems to be a difference. But I think that, too, is beginning to disappear.

CMS: Science depends on continual communication of ideas on a world-wide scale.

HELLER-KALLAI: Yes, this is why Israeli scientists have a reputation for traveling so much. It's the only way not to be isolated, so we try to get around, learn, and establish contacts.

CMS: What's your favorite place?

HELLER-KALLAI: It's hard to say. I have lots of them. I always found that the international clay conferences were a good place for me for establishing and renewing contacts.

CMS: Does Israel have clay resources that are used for anything?

HELLER-KALLAI: Yes, but not very much. They are mostly not economic, or at most marginally so. There is a bentonite deposit that was used for chicken feed, among other things. There's a fairly big palygorskite deposit which was recently discovered and some kaolinite deposits, but not of very high quality. Our flint clay has been used for refractories, but it contains a lot of iron.

CMS: So it sounds like the economic driving forces might be agriculture rather than these other industries.

HELLER-KALLAI: Well, palygorskite may prove to be interesting.

CMS: What would they use that for?

HELLER-KALLAI: For pet litter, for one thing, and I think they are still experimenting on what it may be used for. It's a pretty big deposit, by our standards.

CMS: Clarifying wines, don't they use it for that?

HELLER-KALLAI: I think that is a very small market.

CMS: Do they grow wine in Israel?

HELLER-KALLAI: Yes, even very good wine. I tried to interest the people in our local clays, but I think they don't particularly want to experiment. It's too small a market, so it is not worth their while to experiment with clays.

CMS: Can you make a comparison between the clay journals, like *Clay Minerals* and *Clays and Clay Minerals?* Do you read both of them?

HELLER-KALLAI: I read both of them regularly; I don't see any basic difference between them.

CMS: Just in the format, I guess. Maybe *Clay Minerals*

Heller-Kallai, *continued*

tends to be more geologic.

HELLER-KALLAI: Yes, perhaps. More people seem to be working on geological problems in Europe, but perhaps American scientists find other venues for their geological clay research. Perhaps the type of papers we see in *Clays and Clay Minerals* are partly due to the fact that the more sophisticated new apparatus is more readily available in the States?

What amazes me over and over again is how little we really know in depth.

CMS: Do you think anything should be done or could be done to encourage students to pursue clay science?

HELLER-KALLAI: I think if they find an interest and a prospect of employment they will go that way themselves. I don't know that much can be done other than improve teaching to arouse interest. I believe that it is very important to give students a good grounding in basic scientific subjects, nothing too specialized in the early stages, and then show them what a versatile and fascinating subject clay science is. Perhaps that will attract them, but it depends on what kind of future is in it.

CMS: I guess the future's up to us, discovering new exciting, interesting, and useful things.

HELLER-KALLAI: Yes. We could do a lot with application, as we all know. I think that with clays, whatever reasonable experiments you design will give you some results, but whether they will stand the test of competition by other materials is always questionable.

CMS: Well, modified natural clays may be the best thing because they may be cheap. Although they might not be the best, they might be the cheapest.

HELLER-KALLAI: And harmless.

CMS: Yes, harmless, and maybe good for environmental applications.

HELLER-KALLAI: Could be.

CMS: That's probably where a lot of our efforts are going to go in the future.

HELLER-KALLAI: Yes, to utilize our improved understanding of clays to modify them for practical uses. The possibilities are endless.

AGI/ AIPG Summer Internship

AGI seeks outstanding undergraduate students for the AGI/AIPG summer internship in geoscience and public policy. The internship provides a unique opportunity to gain experience with the legislative and executive branches of the federal government by working in the office of AGI's Government Affairs Program. Intern activities include attending House and Senate hearings and preparing summaries, monitoring and analyzing geoscience and environmental legislation in Congress, and maintaining information on the AGI website. AGI anticipates support for two or more interns during the summer of 1998 at a fixed stipend of $3,000. The internships last twelve weeks, and the starting date will be based on the schedule of the successful candidate. To apply, send a resumé, official transcript, and names and contact information of three references to Dr. David Applegate, Director of Government Affairs; American Geological Institute; 4220 King Street; Alexandria VA 22302 by April 1, 1998. Additional information is available on AGI's website <www.agiweb.org> under Government Affairs.

AGI Congressional Science Fellowship 1998-1999

The American Geological Institute is offering a new Congressional Science Fellowship for the geosciences. The successful candidate will spend a year (September 1998-August 1999) in Washington working as a staff member for a member of Congress or congressional committee. The fellowship is a unique opportunity to gain first-hand experience with the legislative process and make practical contributions to the effective and timely use of geoscientific knowledge on issues relating to the environment, resources, natural hazards, and science policy. Prospective applicants should have a broad geoscience background and excellent written and oral communications skills. Minimum requirements are a master's degree with at least three years of post-degree work experience or a Ph.D. at the time of appointment. Although prior experience in public policy is not necessary, a demonstrable interest in applying science to the solution of public problems is desirable. The fellowship carries a stipend up to $42,000. Funding for the fellowship is provided through the AGI Foundation. Interested candidates should submit a cover letter and a curriculum vitae with three letters of reference to AGI Congressional Science Fellowship, 4220 King Street, Alexandria VA 22302-1502. For further details, visit the AGI web site <www.agiweb.org>, call 703-379-2480, or e-mail <govt@agiweb.org>. EOE All application materials must be postmarked by February 1, 1998. AGI is a federation of 31 scientific and professional societies in the geosciences.

Feats of Clay

CMS Student Research Grants were awarded to: **Sara-Eva Martinez-Alonso,** student of **William Atkinson** and **Alexander Goetz,** U. of Colorado, for Short Wave Infrared (SWIR) Spectometry of Illite to Estimate Temperature of Formation of Hydrothermal Mineral Deposits; **Alba Corral-Avitia,** student of **Antonio Lara,** New Mexico State U., for Metal-Exchanged Layered Clays for Selective Catalytic Reduction of NO_x; **Brad Lee,** student of **Robert Graham** and **Chris Amrhein,** U. of California-Riverside, for Origin of Smectite and Chlorite in Serpentinitic Soils, Klamath Mountains Province, California; **Michelle Markley,** student of **Christian Teyssier,** U. of Minnesota, for Distinguishing between Mineral Growth and Cooling Ages Using the $^{40}Ar/^{39}Ar$ Method on White Micas; and **Elizabeth Gardner,** student of **Tom Pinnavaia,** Michigan State U., for Nitrosodisulfonate Spin Probe Molecules Intercalated into Magnesium Aluminum Layered Double Hydroxides: Intergallery Anion Orientation from ESR Studies.

Lynda Williams, Best Student Paper. *Courtesy L. Williams*

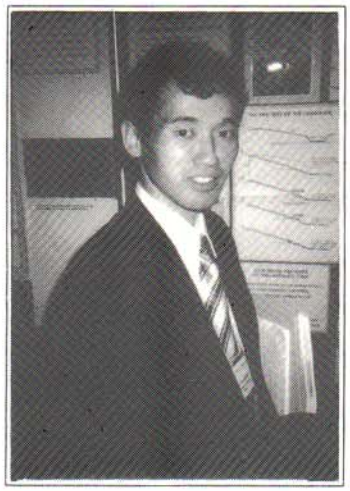
Wouter Idjo, Best Student Paper Runner-up. *Courtesy W. Ijdo*

Student travel grants to the Ottawa meeting, funded by an anonymous donor, went to **Johan Forsman,** student of **Ray Ferrell,** at Louisiana State U.; **Daniel Janeba,** student of **Pavla Capkova,** at Charles U. in Prague; **Maria Propenko,** student of **Warren Huff** at the U. of Cincinnati; **Peter Uhlik,** student of **Vlado Sucha,** at Comenius U. in Bratislava; and **Ardeschir Vahedi-Faridi,** student of **Steve Guggenheim,** at the U. of Illinois at Chicago.

Lhoussain Hassouta, Best Student Poster. *Courtesy L. Hassouta*

Christine Shriner and her husband. Christine and Jean Hemzacek (not shown) were awarded Best Student Poster, tied with L. Hassouta. *Courtesy C. Shriner*

Best Student Paper at the Ottawa meeting was awarded to **Lynda Williams,** Arizona State University, for "Potential for in-situ measurements of oxygen isotopic ratios in clay minerals using secondary ion mass spectrometry;" Best Student Paper Runner-up was **Wouter Ijdo** of Michigan State University, for "Synthesis and properties of regularly interstratified layered silicate heterostructures." There was a tie for Best Student Poster; awardees were **Lhoussain Hassouta,** Université des Sciences & Technologie de Lille, France, for "Clay Diagenesis in a sandstone reservoir (Middle Jurassic) of the North Sea;" and **Christine Shriner** and **Jean Hemzacek** of Indiana University, for "Reconstruction of archeological clay sources using applied clay mineralogy techniques." Best Student Paper Runner-up was **Isao Yasutani** of Kanazawa University, Japan, for "Smectite with NaCl solution related to landslide."



Isao Yasutani, Best Student Poster Runner-up. *Courtesy I. Yasutani*

Awards to be presented at the 1998 meeting in Cleveland are as follows: Distinguished Member, **Brij Sawhney;** Brindley Lecturer, **Bruce Velde;** and Jackson Lecturer, **Murray McBride.**

The results of the 1997 ballot are: Vice President Nominee, **Patricia Costanzo;** Treasurer, **Dave Pevear;** Councilors, **Paul Bertsch, Virginia Colten-Bradley, Jan Srodon,** and **Bruce Velde.**

Ask the Clay Doctor

(Not a real doctor)

Dear Clay Doctor: How does illite form?
Robert Bobert, Hanover

Dear Mr. Bobert: We feel that the answer to this question has already been discovered but that it is being withheld from the public by our own government, a government which refuses to throw open its secret files on illite formation and saucer crashes!

Dear Clay Doctor: Who is the meanest clay scientist?
Fred Pevear (no relation), Houston

Dear Fred: Professor Ed Narry, a proponent of smash-mouth clay mineralogy, would show up at clay meetings wearing black leathers, and hector into the lecture hall surrounded by his graduate student toughs. He would take the lectern, make a statement such as, "Illite is nothin' but ground-up mica," and then sneer at the audience, daring to be challenged. At one such meeting, he was contradicted by Professor Burgess Shaley. Professor Shaley, as has become necessary for prominent clay scientists, had his own cadre of bodyguards. Nevertheless, this was a courageous act by Shaley.

Dear Clay Doctor: Ethylene glycol (EG) is widely used in analytical studies for the stable expansion of swelling clays at room temperature. Has this always been the case?
At Lunch in Atlanta

Dear At Lunch: No. In fact, there is a rich history of alternative substances for this purpose that can be traced back to the great EG embargo of 1906. In that year, you will recall, EG producers caught in an ugly price war completely shut down production of the vital substance, much to the dismay of clay labs worldwide. A short time later an ingenious Swede named Arnie "Woo Woo" Johanson discovered by accident (I won't go into details) that cream cheese works just as well, especially when combined with a bit of smoked salmon. However, spreading it on individual platelets was found to be rather time-consuming. A few crafty Americans, in the hopes of creating new markets, substituted peanut butter, but, alas, fell into endless bickering over interlaboratory standards for peanut particle size in the crunchy variety. Ultimately, a mixture of grape jelly and salad dressing (French) found widespread acceptance. An intended demonstration of these methods at the 1928 International Clay Conference had to be abandoned when the display samples were devoured by a Bassett hound belonging to the Secretary-General.

Dear Clay Doctor: Why don't clay minerals occur as large crystals?
Beyond Belief in Bayonne

Dear Beyond: Your question raises a delicate subject and one that, in my youth, would never have been discussed in public. But times have changed, so at the risk of unintended injury to the feelings of some of our readers, dare I say the answer is, broken bonds. You see, clays begin their existence fully intending to reach pegmatitic proportions, and a few actually have. Louis XIV had a tea table made from a single crystal of kaolinite which, regrettably, was destroyed during the revolution. And Basque monks were reported to have enjoyed a 16th century form of frisbee using dehydrated halloysite flakes. But I digress. It seems that early in their growth, most clay crystals suffer (sob) broken bonds, and the little nippers never get any bigger after that. If this issue concerns you, may I suggest you consider undertaking a crusade to raise public awareness of this most tragic situation.

Dear Clay Doctor: I have been building miniature forests. I've been using pebbles to simulate boulders, and pine trees, normally 40 feet tall, stand just one foot. I would like to scale the soil, too, and am looking for clays that are 1/40 normal size. Can you help?
Bonsai Bob, Hanover

Dear Bonsai Bob: The best place to buy unusual clays would be the Clay Mineral Hall of Fame in Fithian, Illinois. They have many rare clay specimens, including the famous Fithian Illite. Mixed with this illite, for no extra charge, are chlorite, quartz, calcite, and other interesting minerals.

Dear Clay Doctor: I just got a new copy of Moore and Reynolds' book, second edition, and am very pleased by the revised cover. The wire in the first edition cover would snag and ruin sweaters. In the second edition, the wire is hidden. Also, the cover's slick surface makes an excellent coaster. Altogether, an impressive cover!
Maiden Hurry, Bloomington

Dear Ms. Hurry: I guess it is possible to tell a book by its cover.

The Clay Doctor is available for consultation. Please send questions c/o CMS News.

The Clay Minerals Society 35th Annual Meeting

June 6-11, 1998, Cleveland, Ohio
Cleveland Marriott Downtown at Key Center

Workshop

Molecular Modeling of Clays (Saturday, June 6)
Organized by James D. Kubicki and William F. Bleam

Workshop Speakers

William Bleam (University of Wisconsin) & James Kubicki (Computer Sciences Corporation)
James Rustad (Pacific Northwest Laboratories)
Randy Cygan (Sandia National Laboratories)
Neal Skipper (University of London)
Edward Tipping (Institute of Freshwater Ecology - UK)
Biosym/MSI
Wavefunction, Inc.

Symposia

Molecular modeling of clays and clay surfaces
Clays in the petroleum and extractive industries
Smectite-rich soils
New developments in the Geochronology of clays, oxides and zeolites
Remote sensing of clays

Field Excursions

Bedrock and Coastal Geology of Ohio's North Coast
Family field excursion to Kelly's Island glacial grooves

Chair

Dr. Samuel M. Savin
Dept. of Geological Sciences
Case Western Reserve University
Cleveland, OH 44106 USA
Phone: 216-368-4413
Fax: 216-368-3842
Email: sms7@po.cwru.edu

The Clay Minerals Society
Organization and Committee Personnel 1997-1998

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C.B. Roth '00
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**Ex officio*

Golden Jubilee Meeting, Clay Minerals Group

On 24th January 1947, the inaugural meeting of the Clay Minerals Group, the first specialist group of The Mineralogical Society, was held in the rooms of the Geological Society in London. Fifty years later, the Group met at The Macaulay Land Use Research Institute in Aberdeen to mark the occasion of its Golden Jubilee with a meeting on the theme "Clay Mineralogy-Past, Present and Future." Convened by Derek Bain, the meeting took place from 9-11 April, and was attended by over 80 delegates, almost half from overseas.

All ten surviving past chairmen of the Group had been invited, and all but one attended. Of these, it was particularly gratifying to welcome three founder members—Robert H.S. Robertson, Barbara S. Neumann and Robert C. Mackenzie. Other guests were the Presidents of AIPEA (Haydn Murray), European Clay Groups Association (Emilio Galan), and the Mineralogical Society (Andy Rankin).

A tour of the laboratories of the Macaulay Institute on the first day was followed by an ice-breaker reception hosted by the Institute, providing the first opportunity for delegates to socialize.

A prime mover in generating enthusiasm and support for the new Group in 1947 was D.M.C. MacEwan who was unable to attend the meeting but who provided a very appropriate and entertaining recorded presentation on the origin of the Group to open the meeting. Jeff Wilson gave an invited lecture on "The origin and formation of clay minerals in soils: past, present and future perspectives" to open a half-day session on soil clays. The afternoon session devoted to clays in geology was set in motion by an invited talk by Jan Srodon on "Use of clay minerals in reconstructing geological processes: current advances and some perspectives". The following morning's session on chemical/industrial aspects of clays was introduced by a keynote lecture by Haydn Murray on "Applied clay mineralogy-today and tomorrow." All three keynote speakers gave fascinating accounts of past and present trends in the subject, together with predictions for the future.

Founder Members: R.H.S. Robertson, B.S. Neumann, and R.C. Mackenzie. Courtesy D. Bain

Principal Editors of Clay Minerals: *R.C. Mackenzie (1959-1964), D.C. Bain (1987-present), and D.J. Morgan (1979-1987).* Courtesy D. Bain

In addition to 22 papers presented orally, 23 were presented as posters covering all aspects of clay mineralogy and demonstrating the extraordinarily diverse nature of the subject. A limited number of copies of the Abstract Volume (including "An Historical Commentary" about the Group) is available from the Mineralogical Society office (41 Queen's Gate, London SW7 5HR; e-mail: k_murphy@minersoc.demon.co.uk) at a cost of £7.50 (plus postage if outside Europe). A Commemorative issue of Clay Minerals will be published with some of the papers presented at the meeting.

The social side of any meeting is important in providing an opportunity to forge new contacts, and not only was this so on this occasion, but numerous old friendships were renewed and stories told of by-gone days. In addition to the ice-breaker reception at the Macaulay Institute, there was a Civic Reception at the Town House followed by the Conference Dinner in the old Elphinstone Hall at the University of Aberdeen at which

delegates were entertained to Highland dancing accompanied by bagpipes.

Because a number of members were accompanied by their wives, a visit was arranged to nearby Crathes Castle and gardens, which the ladies were able to enjoy to advantage because of the bright sunny Spring weather.

On the afternoon of the last day, many delegates participated in the optional trip to Royal Deeside, the highlight of which was a visit to the Royal Lochnagar Distillery near Balmoral Castle to see how the local whisky is made and including, of course, a sampling session!

Chairman of the Group, Invited Speakers, and Presidents of AIPEA, ECGA, and The Mineralogical Society: C.V. Jeans, A. H. Weir, M J. Wilson, J.A. Bain, B.S. Neumann, A. Parker, H.F. Shaw, R.C. Mackenzie, R.H.S. Robertson, E. Galan (President of ECGA), H.H. Murray (President of AIPEA), and A. H. Rankin (President of The Mineralogical Society). *Courtesy D. Bain*

Chairman of Group, Invited Speakers, President of AIPEA, and Convener: A. Parker (Chairman of Group), J. Srodon, H.H. Murray, M J. Wilson , and D.C. Bain (Convener). *Courtesy D. Bain*

Clay Minerals Group meetings are normally small and friendly affairs. The Golden Jubilee Meeting continued this tradition but was unique in providing an interesting and unusual blend of up-to date research, a look at where the subject is going in the future and more than the usual amount of reminiscing. The age range was greater than normal, as was the proportion of delegates from overseas, enriching the occasion as a consequence. It was a privilege for me, as convener, to be able to bring together so many individuals who have contributed over the years to the work of the Group and to the study of clays. Some of these people have retired or moved out of clay research, and it was gratifying that they made an effort to be part of the Group's celebrations. The Group looks forward to the next 50 years, and hopefully some of those in Aberdeen in April will help to celebrate our centenary in due course!

Derek Bain
The Macaulay Land Use Research Institute, Aberdeen

Bailey Award,

continued from page 1

tions and documentation from CMS members will be sent to the chair of the committee, although the awardee does not need to be a CMS member. Please see letter on page 2 for information on nominations. In addition, the award will consist of a $2000 cash award and expenses to attend the CMS annual meeting.

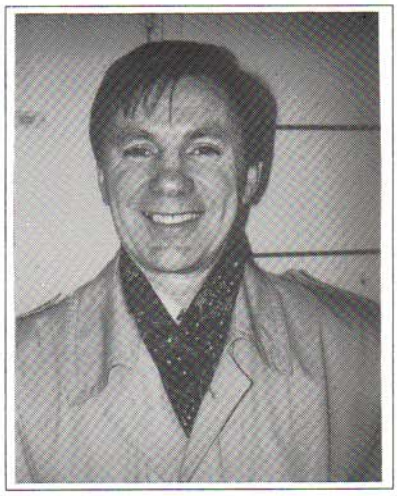
The CMS is grateful to Linda and David Bailey for their moving generosity in endowing the Bailey Award in memory of their parents. Certainly the name "Bailey" is synonomous with excellence in clay research, and it will be the Society's highest honor, as the Distinguished Member Award has been until now.

French Clay Group honors Victor Drits

On March 19th and 20th, 1997, the French Clay Group (GFA) organized in Paris two "Journées scientifiques" in honor of Victor Anatolievitch Drits, under the auspices of the French Ministry of Education and Scientific Research. About 100 persons joined this meeting to celebrate more than twenty years of fruitful collaboration between the French community of Physics and Earth Sciences and the research group lead by Victor Drits, and more generally with various laboratories from Eastern Europe. Scientists from other European countries and the United States were also present.

Anatoly Gorshkov, Victor Drits, Alain Manceau, and Boris Zvyagin. D. Eberl

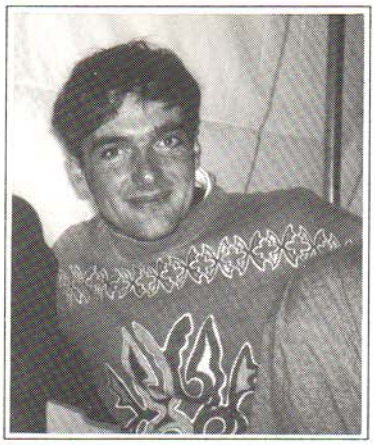
This collaboration resulted from the initial friendship between V.A Drits and Jacques Méring, from the Laboratory of Crystallography in Orléans. This friendship began at the International Congress of Crystallography held in Moscow in 1966, where French scientists such as André Guinier, A. Gauthier, and Cyril and Denise Tchoubar were also present. This privileged relationship continued to develop on the occasion of several conferences, and the idea of a formal covenant was raised at the Electron Microscopy conference held in Grenoble in 1970. A memorable night between the International Clay Conference in Madrid and Moscow gave to Drits and Méring, together with Rachel Glaeser, the opportunity to (re)build their own, scientific world. Unfortunately, J. Méring died in 1973, but the idea of a collaboration between the two laboratories was resumed by Cyril Tchoubar on the French side and by Drits on the Russian one, supported by B. B. Zvyagin. The first formal project of collaboration between the French C.N.R.S. and the Russian Academy of Sciences was set up during Tchoubar's visit to Moscow in 1975, but was not approved by the Academy. However, the dual approach with experimental work and modeling was developed in parallel in both laboratories by researchers such as G. Besson, A. Plançon, C. H. Pons, F. Rousseaux (here I may miss some people) on the French side, and A. S. Bookin, L. G. Dainyak, B. A. Sakharov, A. L. Salyn, M. Slonimskaya, and S. Tsipursky. The first official convention between both laboratories was finally signed in 1980 and immediately followed by the first official trip of C. Tchoubar and A. Plançon to Moscow. The bases for several years of



Alexander Bookin. D. Eberl

Boris Sakharov, Alain Plançon, and S. Bookin. D. Eberl

Gerard Besson. B. Lanson



Bruno Lanson. *J. Eberl*

Phillippe Ildephonse and Christine Mosser. *D. Eberl*

Françoise Elsass *D. Eberl*

Vlado Sucha. *B. Lanson*

Alain Baronnet *B. Lanson*

very fruitful collaboration and common work with high scientific standards were then solidly established. The huge amount and the high quality of scientific articles resulting from this collaboration was crowned in 1990 by the publication of a book which is probably THE reference for X-ray diffraction by lamellar structures written in four years, three languages, by seven co-authors. In 1992 Drits was awarded the title of Doctor Honoris Causa by the University of Orléans.

Obviously, this example has been very inspiring for young scientists who have been attracted by the insatiable thirst of V. A. Drits for problems at the boundaries between physics and earth sciences. This was the occasion for new collaborations between the laboratory of V. A. Drits and research groups, not only French (Orléans, Grenoble, Paris, Poitiers, Strasbourg...) but also Danish and American. The huge contribution of V. A. Drits to this field has been recognized by several scientific societies which have honored him: The Clay Minerals Society made him a Distinguished Member, The Mineralogical Society made him an Honorary Member, and AIPEA awarded him its Gold Medal.

The two intense and breathtaking days of the conference in March were the oc-

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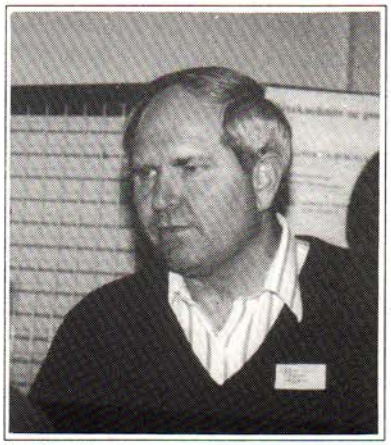
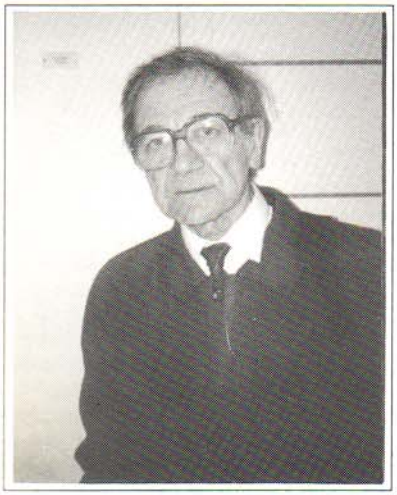


Joe Stucki *B. Lanson*



Boris Zvyagin. *D. Eberl*

Holger Lindgreen. *D. Eberl*

Dennis Eberl and Jan Srodon. *B. Lanson*

EUROCLAY '99

Conference of the European Clay Groups Association, Krakow, Poland, September 4 - 10, 1999

Contributions from all fields of clay science are welcome. They will be grouped into appropriate oral and poster sessions, depending upon submissions, or they will be included in the following symposia, intended to present overviews of specific topics, which will be organized by the conveners: 1. New techniques of clay research (Jean-Pierre Muller & M. J. Wilson); 2. Order-disorder features of clay minerals (Victor Drits & Robert C. Reynolds); 3. Crystal size analysis of clay minerals (Dennis Eberl & Francoise Elsass); 4. Hydrotalcites: synthesis, physicochemical properties and applications (Angelo Vaccari & Ewa Serwicka) ; 5. Surface modification of clay minerals and application of such materials (Faiza Bergaya & Gerhard Lagaly); 6. Illite and mica formation and transformation in continental environments (Dominique Righi & Arieh Singer); 7. Comparison between sea-floor and land-based basalt alterations: are these two processes and their secondary products that different? (Jose Honnorez & Suzanne Schmidt); 8. Low-grade metamorphism of sheet silicates (Martin Frey & Laurence Warr); 9. Clay minerals as tools in basin analysis (Norbert Clauer & Juraj Francu); 10. Clays in hydrocarbon reservoirs (Andrew Hurst & Paul Nadeau); 11. New developments in the traditional industrial applications of clays (Haydn Murray & Marek Tokarz); 12. Clay barriers and waste management (Kurt Czurda); Workshop: "Clays in the Environment," Banska Stiavnica, Slovakia, after the conference, combined with visits to Slovakian clay deposits and acid mine sites. Topics: Clays under acid conditions (M.J. Wilson, Michel Robert), Clay-toxic elements interactions (Edeltrauda Rybicka, Will P. Gates, Kurt Czurda), Clay barriers (Roland Push, Daniel Tessier). Contact: Mrs. Aka Srodon, Euroclay 1999, Institute of Geological Sciences PAN, Senacka 1, 31-002 Krakow, Poland; fax: 48-12-221609; e-mail: ndsrodon@cyf-kr.edu.pl; website: http://www.ing-pan.krakow.pl

Drits, *continued from page 25*

casion for many to discover how broad is the interest Victor Drits has developed for earth sciences through the prism of his physicist's formation. A large proportion of the 28 conferences and 8 posters were devoted to the crystal chemistry and the structure of fine-grained minerals including phyllosilicates, phyllomanganates and iron oxides. Results of various diffractometric and spectroscopic techniques were presented, as well as several works dealing with soil mineralogy, diagenetic processes, and more especially illitization of smectites.

Gérard Besson, Orléans
Bruno Lanson, Grenoble

Program: G. Besson: History of the Franco-Russian collaboration; Victor A. Drits: Actual crystal structure of fine-grained layer minerals: Problems and solutions; B.B. Zvyagin, A.P.Zhukhlistov: Electron diffractometry: A new development in the electron diffraction structure analysis; A. Baronnet: Crystallography and microstructures of curved serpentines; A.S. Bookin: Interlayer dependent stackings in lamellar crystals; A. Plançon, V.A. Drits: Phase analysis of clays by expert system; B.A. Sakharov: Simulation of X-ray diffraction pattern for multicomponent mixed-layer minerals; B. Lanson, V.A. Drits, A.I. Gorshkov, A. Manceau: The amazing structure of calcium birnessite; A. Manceau, V.A. Drits, E. Silvester, C. Bartoli, B. Lanson: Structural Mechanism of Co(II) Oxidation by the phyllomanganate, Na-Birnessite; D. Bonnin: Mössbauer spectroscopy of iron oxides fine particles; G. Besson, V.A. Drits: Relationships between chemical composition and infrared spectra of micaceous minerals; J.L. Robert: Crystal chemistry of hydroxyl and fluor in synthetic 2:1 phyllosilicates: Order relations and geochemical applications; M. Pinthier, V. Laperche, E. Huard, J.L. Robert, R. Prost: Far infrared study of interlayer and octahedral cation vibrations in phyllosilicates; J. Yvon, J.M. Cases: Crystal chemistry guides for the use of kaolinite; C. Mosser: Transition elements in clay structures; S. Petit, D. Righi, J. Madejov, A. Decarreau: Quantification of charges in smectites: A new method by IR spectroscopy; J. Madejov, P. Komadel, J. Bujdk, V. Sucha, F. Elsass: Reduced-charge Li-montmorillonites; D. Righi, F. Gillot, F. Elsass, S. Petit: Transformation of smectite in two contrasted soil environments; J.W. Stucki: Evidence for structural changes in smectites during reduction and reoxidation processes; J.P. Muller, G. Lauquet, T. Allard, E. Ballan, B. Boizot, A. DjemaÔ, G. Morin: Crystal chemistry of Fe(III) in organo-mineral associations from low temperature systems: Recent results and geochemical perspectives; A. Meunier: Towards a general model for smectite and I/S illitization in diagenetic environments; N. Clauer: Isotopic constrains to illitization mechanism during diagenesis; H. Lindgreen, V.A. Drits, B.A. Sakharov, H.J. Jakobsen, A. Salyn: Mechanism of transformation of illite-smectite-vermiculite in Jurassic North Sea oil source rock shales; V. Sucha, F. Elsass, D. Eberl, J. Madejov: Synthetic ammonium illite; D.D. Eberl, V.A. Drits, J. Srodon: Measurement of illite crystallite thicknesses by the XRD method of Bertaut-Warren-Averbach; J. Srodon, D.D. Eberl, V.A. Drits: Evolution of crystal size during illitization of smectite; B. Velde : Mica structures, mineral phases, growing crystals and diagenesis; J.F. Deconinck, P.Y. Gillot, M. Steinberg, A. Strasser: Illite of the third type: an isotopic confirmation; M. Thiry, J.M. Schmitt: Mineralogical association in paleoalterations: Contribution from geochemical modeling; J.F. Alcover, F. Bergaya, C. Clinard, P. Dion, D. Massiot, F. Rouquérol, D.Tchoubar: Metakaolinite or bridging of dehydroxylated layers of kaolinite; I. Bihannic, J.P. Uriot, J. Lambard, D. Tchoubar, F. Thomas, G. Besson, J.M. Cases: Small and very small angles X-ray diffraction and scattering study of structural & textural modifications of Na-montmorillonite during water vapor adsorption; K. Faisandier: Gel-hydrated solide transition in montmorillonite suspensions; J.M. Gaite: Measurements of iron concentration in kaolinites, considering disorder-broadening of EPR lines; A.I. Gorshkov, V.A. Drits: Structural and chemical study of new mixed-layer serpentine-hydrotalcite and intergrown halloysite-amesite by SAED & EDA; F. Muller, A. Plançon, V.A. Drits, G. Besson: X-ray diffraction study of heat-treated celadonites & glauconites; M. Pelletier, P. de Donato, F. Thomas, L. Michot, J.M. Cases: Adsorption/Desorption of water vapor by homoionic montmorillonites: Infrared spectroscopy study; R. Prost, E. Huard: Selective fixation of cations (K, Rb, Cs) by vermiculite: Determination of the mechanisms. Scientific Committee: G. Besson, A. Decarreau, A. Manceau.

Meeting Calendar

March 9-11, 1998, Orlando, Florida: SME Annual Meeting. Contact: Meetings Dept., SME, PO Box 625002, Littleton, CO 80162-5002, USA; Tel: 303-973-9550; fax: 303-979-3461; smemet@aol.com; http:smenet.org

March 26-27, 1998, Cambridge, UK: Mineral diagenesis and reservoir quality—the way forward. Sixth Cambridge Diagenesis Conference sponsored by the Mineralogical Society, Petroelum Exploration Society of Great Britain, London Petrophysical Society, and Geological Society. Contact: C.V. Jeans, Dept. of Earth Sciences, Downing Strret, Cambridge CB2 3EQ, UK. Tel: 01223-333400; fax: +44-1223-333450

May 3-6, 1998, Cincinnati, Ohio: 100th American Cermaic Society Annual Meeting. Contact: American Ceramic Society, PO Box 6136, Westerville, Ohio, 43086-6136, USA. Tel: 614-890-4700; fax: 614-899-6109; WWW: http://www.acers.org

May 18-20, 1998, Québec City, Québec: Joint meeting of the Geological Association of Canada, the Mineralogical Association of Canada, and the Association professionelle des géologues et des géophysiciens du Québec. Contact: Mme Agathe Morin, Département de géologie et de génie géologique, Université Laval, Pavillon Adrien-Pouliot, Sainte-Foy (Québec) G1K 7P4, Canada. Tel: 418-656-2193; fax: 418-656-7339; quebec1998@ggl.ulaval.ca; http://www.ggl.ulaval.ca/quebec1998.html

June 13-17, 1998, Cleveland, Ohio, USA: Clay Minerals Society Annual Meeting. Contact: Sam Savin, Dept. of Geological Sciences, Case Western Reserve University, Cleveland, Ohio. Tel: 216-368-6592; fax: 216-368-3691; e-mail: sms7@po.cwru.edu

June 29-July 1, 1998, Brisbane, Queensland, Australia: Australian Clay Minerals Society Conference. Contact: Ray Frost, Centre for Instrumental and Developmental Chemistry, School of Chemistry, QUT, PO Box 2434 GPO, Brisbane, Queensland 4001, Australia. Ph: 61 07 3864 2407; Fax: 61 07 3864 1804; e-mail r.frost@qut.edu.au; homepage:http://www.sci.qut.edu.au/physci/conference/ACMS/

August 20-26, 1998, Montpelier, France: World Congress of Soil Science. Contact: 16th World Congress of Soil Science, Agropolis, Avenue Agropolis, 34394 Montpelier cedex 5, France; Tel: 33-67-04-75-38; fax: 33-67-04-75-49; isss@agropolis.fr; Server WWW: http://www.cirad.fr/isss.html

August 31-September 4, 1998, Brno, Czech Republic: 15th Conference on Clay Mineralogy & Petrology. Contact: Dr. Petr Sulovsky, Dept. of Mineralogy, Petrology and Geochemistry, Faculty of Science, Masaryk University, Kotlarska 2, 611 37 Brno, Czech Republic; phone +420-541129231; fax +420-541211214, +420-541123231; home page: http://www.sci.muni.cz/~sulovsky/15clays.html

October 18-23, 1998, Baltimore, Maryland, USA: SSSA Annual Meeting. Contact: SSSA, 677 South Segoe Road, Madison, WI 53711, USA.

October 26-29, 1998, Toronto, Ontario, Canada: Geological Society of America, Mineralogical Society of America. Contact: GSA, PO Box 9140, Boulder, CO 80301. Tel: 303-447-2020.

September 4-10, 1999, Krakow, Poland: Euroclay 1999. Contact Jan Srodon, Institute of Geological Sciences PAN, Senacka 1, 31-002 Krakow, Poland. Fax: 48-12-221609; e-mail: ndsrodon@cyf-kr.edu.pl

Mineral diagenesis & reservoir quality—the way forward

A meeting convened by Dr. C. V. Jeans, the sixth in a series on petroleum-related themes, will be held in the Department of Engineering, Trumpington Street, Cambridge, on 26-27 March 1998, with accomodation available in Pembroke College nearby. Scientific sponsors are the Mineralogical Society, the Petroleum Exploration Society of Great Britain, the London Petrophysical Society, and the Geological Society. The conference will be concerned with siliciclastic reservoirs, their mineral diagenesis, burial and pore fluid histories, and the prediction of reservoir quality. Publication of papers from this meeting will take the form of a thematic issue of *Clay Minerals*, whose size will depend upon funding available. Anyone wishing to contribute a paper should submit a title as soon as possible to: Dr. C.V. Jeans, Dept. of Earth Sciences, University of Cambridge, Downing St., Cambridge CB@ 3EQ, UK; tel: (01223) 333400; fax: +44-1223-33450.

XVth Conference on Clay Mineralogy and Petrology

The conference will be held on the campus of Masaryk University in Brno, Czech Republic, August 30 - September 4, 1998 under the auspices of the Ministry of the Environment with the participation of UNESCO/IUGS, International Geological Correlation Programme. The scientific program will cover all topics of theoretical and applied clay science. The principal themes of its proceedings will be: Clay mineralogy and petrology, Applied research of clay materials, Industrial applications of clay science, Clay minerals and the environment, Clays in soil research, The role of clay minerals in weathering (an IGCP #405 Workshop). Simultaneously, the Annual Meeting of all participants and interested scientists of I.G.C.Project 405—Anthropogenic Impact on Weathering Processes—will be held. The program of the conference will be complemented with multi-dimensional excursion(s) to Neogene clay deposits, Recent vineyards, and industrial enterprises utilizing clays, and social events for the participants and accompanying guests. Home page: http://www.sci.muni.cz/~sulovsky/15clays.html

POSITION ANNOUNCEMENT

Dept. of Crop & Soil Sciences, Michigan State University. Soil Chemistry-Assistant Professor. Tenure-track, 12-month faculty position involves teaching (25%) and research (75%). Develop an externally funded, innovative, interdisciplinary research program in basic soil chemistry and its application to environmental problems. Emphasis in organic soil chemistry utilizing modern analytical and spectroscopic approaches. Teach 2 graduate level courses in areas such as soil chemistry, environmental surface chemistry, and clay mineralogy, and share responsibility for an undergraduate soil chemistry course. Interact with other programs in environ. sciences and engineering on campus, and the Departments of Chemistry and Geological Sciences. Ph.D. required in Soil Chemistry or related area. Send a detailed resumé, a two-page statement of teaching & research interests, reprints or preprints of key publications (up to five), copies of all college transcripts and names, addresses, telephone and fax numbers of 3 professional references (postmarked) by December 15, 1997 or until position is filled. Application packages should be submitted to Dr. Stephen A. Boyd, Dept. of Crop & Soil Sciences, Michigan State University, East Lansing, MI 48824-1325. Phone: 517-353-3993; fax: 517-353-5174; e-mail: johns146@pilot.msu.edu. MSU is an Affirmative Action/Equal Opportunity Institution. Position approval is pending.

CMS Membership Application

To join the CMS, please send a copy of the application below, along with the required dues in U. S. funds, drawn on a U.S. bank, to The Clay Minerals Society, P.O. Box 4416, Boulder, CO 80306. Visa or Mastercard may also be used. Please include card number, expiration date, and name as it appears on the card. Subscribing members receive *Clays and Clay Minerals,* the journal of the CMS.

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Quantitative Mineral Analysis of Clays, CMS Workshop Lectures, Volume 1, Pevear & Mumpton, editors, **$17.00**
Electron-Optical Methods in Clay Science, CMS Workshop Lectures, Volume 2, Mackinnon & Mumpton, editors, **$21.00**
Thermal Analysis in Clay Science, CMS Workshop Lectures, Volume 3, Bish, Mumpton, & Stucki, editors, **$13.00**
Package price: Volumes 1, 2, and 3 above, $30.00
Clay-Water Interface and its Rheological Implications, CMS Workshop Lectures, Volume 4, Güven & Pollastro, editors, **$18.00**
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