



# THE GEOCHEMICAL NEWS

Newsletter of The Geochemical Society

NUMBER 95

APRIL 1998

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**9<sup>th</sup> V.M. Goldschmidt Conference**  
**Harvard University, Cambridge, MA,**  
**U. S. A.**  
**August 22-27, 1999**

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*BU:* R. Murray. *WHOI:* J. Hayes, N. Shimizu.



**Kenneth S. Pitzer , Chemist & Science Leader**

**1914-1997**

Kenneth S. Pitzer, professor emeritus of Chemistry at UC Berkeley, died of heart failure on December 26 after a brief illness at the age of 83. Professor Pitzer was well known among geochemists for his textbook on Thermodynamics (1961 and 1995), for the "Pitzer" equations, formulations for ion-interactions in concentrated aqueous solutions, which provide the key to mineral equilibria in natural brines, and for his equations-of-state for vapor-liquid relations in salt solutions.

visit the new Geochemical Society website:

<http://www.geochemsoc.org>



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SECRETARY  
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## THE GEOCHEMICAL SOCIETY

The **Geochemical Society** is a nonprofit scientific society founded to encourage the application of chemistry to the solution of geological and cosmological problems. Membership is international and diverse in background, encompassing such fields as organic geochemistry, high and low-temperature geochemistry, petrology, meteoritics, fluid-rock interaction, and isotope geochemistry. The Society produces a **Special Publications Series**, *The Geochemical News* (this quarterly newsletter), and (jointly with the Meteoritical Society) the journal *Geochimica et Cosmochimica Acta*; grants the **V.M. Goldschmidt, F.W. Clarke and Clair C. Patterson Awards**, and, jointly with the European Association of Geochemistry, the **Geochemistry Fellows** title; sponsors the **V.M. Goldschmidt Conferences**, held in North America in odd years and elsewhere in even years, jointly with the European Association of Geochemistry; and co-sponsors the Geological Society of America annual meeting and the spring meeting of the American Geophysical Union. The Society honors the memory of our first President, F. Earl Ingerson, and our first Goldschmidt Medalist, Paul W. Gast, with the **Ingerson and Gast Lectures**. The Geochemical Society is affiliated with the American Association for the Advancement of Science and the International Union of Geological Sciences.

Members of the **Organic Geochemistry Division** are individuals with interests in studies on the origin, nature, geochemical significance, and behavior during diagenesis and catagenesis of naturally occurring organic substances in the Earth, and of extraterrestrial organic matter. GS members may choose to be affiliated with the OGD without any additional dues. The OGD presents the **Alfred E. Treibs Award** for major achievements in organic geochemistry, and **Best Paper** awards (student and professional) in organic geochemistry.

### Editor's Corner

Dear Readers:

Please feel free to contact us with contributions for *The Geochemical News*. We want to publish all the geochemical news that's fit to print -- and you are the reporters!

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visit the new **Geochemical Society** website:

<http://www.geochemsoc.org>



## From the Coordinator of Internet Resources

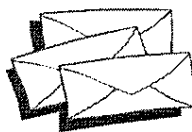
It seems like only yesterday I was writing the entry for the fall newsletter. Time has flown, and the development cycle for the GS web site is approaching an important crossroads. Several new membership services will make their debut in this quarter, and others will be soon to follow.

The most recent addition to GS Online is our interactive membership directory. You can now search the directory on-line, and make updates to your name, address, and geochemical interests. A directory search is keyed to a member's name, geographic location, or interests and will return a list of members who match your search criteria. The update feature allows members to revise or add information to their database record. Some of this information already exists in the database, but some (such as your home page address) is new and the fields are probably empty. We encourage everyone to fill in the missing information and revise information that is out of date.

Next to go live are the discussion groups and Ask-A-Geochemist. These services are public threaded discussion forums, the first intended for the GS membership and the second for the masses. A user ID and password will be needed to enter the forums. You can register a new user ID and password the first time you log into the service. These are used only to associate a user with threads and messages during the current session, and need not correspond to your GS membership ID. Ask-A-Geochemist needs a team of moderators - members who are prepared to respond to queries or forward them to colleagues. We've tried to make this a painless experience - there's no need for moderators to log into the system just to see if there are new queries. One or more of the moderator team will receive a brief e-mail when a question is posted to a topical forum in Ask-A-Geochemist. Won't you volunteer a small amount of your time to help increase public awareness of the GS?

The GS educational outreach initiative with the Mineralogical Society of America and the GSA is taking shape. The topic for our first K-12 module was selected in a meeting during the GSA Annual Meeting. "Marine geoscience" was chosen because it is "hot", it does not already have a large web presence, and because there is a wealth of information of interest to the initiative partners from which we can build content. Our initial efforts will focus on the geochemistry of submarine hydrothermal vents. Suggestions from the K-12 audience are being sought to identify interactive activities useful in a grade 9-12 classroom setting. We are again appealing to the GS membership for assistance in developing content. Please consider this opportunity carefully. Is there a way you might like to contribute? Everything from a short message that outlines essential content, to activity development in sub-modules, is welcome and will be gratefully acknowledged.

Mark Bloom, Coordinator of Internet Resources  
Rocket geoScience, Inc. (303) 772-0735  
msbloom@geochemsoc.org



## Letters to the Editor

Dear Editor:

Let me first say what a good job you are doing with the onerous and demanding task of editing *The Geochemical News*. However, if I may paraphrase Samuel Johnson, 'an author may aspire to praise; an editor can only hope to escape reproach'. On the latter theme, I am concerned about the previous two scientific papers in the Newsletter, which seem to me to be superficial treatments of important topics. This raises some important issues.

1. Should the newsletter be used for such articles?
2. How should they be solicited?
3. Should they go out for peer review.

I realise that you don't want to get too formal but on the other hand, it would be a pity to see the Newsletter turn into a forum for unreferenced material or for people to express their personal opinions. It's a slippery slope.

with best wishes,  
Ross Taylor

Stuart Ross Taylor  
Emeritus Professor  
Dept of Nuclear Physics  
Australian National University  
Canberra, A.C.T. Australia 0200

Dear Ross:

*Thanks for your thoughts on the newsletter. Regarding the three specific questions that you raise:*

1. Should the newsletter be used for such articles?

*This issue was considered in depth by the Geochemical Society board members. The general consensus is that The Geochemical News can and should be more than just an occasional collection of meeting announcements and award nomination solicitations. Articles, letters, and other input are desired. Because this is not a scientific journal, it is not appropriate to present original scientific results (e.g., unpublished data). Timely reviews of current work in various "hot" geochemical areas are preferred, written to be accessible to geochemists who may not be specialists in the field but who are interested in finding out what's happening. Of course, we want these articles to be perceptive, well written, accurate, and not overly slanted toward the author's opinions. Ultimately, the reader can skip an article if he or she is not interested. If the reader disagrees with it, he or she can respond with a letter or comment.*

2. How should these articles be solicited?

*The principal mode of solicitation is The Geochemical News (see p. 6 of this issue). In addition, based on suggestions from Board members and others, specific individuals are contacted for the purpose of soliciting articles on specific subjects in which they are considered authoritative.*

3. Should these articles go out for peer review?

*For future articles we will solicit two external peer reviews.*

Respectfully,  
the Editor



### Notes from the Business Manager

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1350 West Fifth Avenue  
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Columbus, OH 43212, USA

phone: 614-487-8290  
fax: 614-486-7065  
[geochsoc@pubcon.com](mailto:geochsoc@pubcon.com)  
<http://www.geochsoc.org>

As of March 1, 1998 the Geochemical Society has a total of 1547 members!

#### RENEWALS PENDING

If your membership is still pending, please have your payment in to the Business office by the end of April.

#### MEMBERSHIP DIRECTORY

The Geochemical Society membership directory for 1998/1999 will be going out in April. For those members who receive GCA, the directory will be sent with one of your issues in April.

#### AGU FALL STUDENT AWARD

Professional members of the Geochemical Society may submit a name of a student with the criteria listed below to receive free registration which also includes all technical sessions to the Fall AGU meeting held in December 1998 in San Francisco.

1. List of student publications (main and coauthor)
2. Student research, past & current
3. any other criteria deemed appropriate in considering this student for this award.

Deadline for this submission: August 1, send to the Business Office via e-mail, fax or mail. Discussion and voting for this award will be held at the Business Meeting in August at the Goldschmidt Conference in Toulouse. The student will be notified in September and the award will be announced in the October newsletter.

### GCA Production Update

- (1) **Mailing of GCA 61:19 and 20.** This information will concern member subscribers outside the USA only. We began providing electronic labels to our printer for sending out the journal starting with issue 17. The mailing for issues 17 and 18 went as planned. However, the name field for the labels for issues 19 and 20 for subscribers outside the USA was not included on the label. The problem was corrected and a letter was sent out with issue 21 with the information for requesting replacement copies. Replacement copies are being sent out as requests are received by Peter Henn at Elsevier Science Ltd in Oxford. Some subscriber's institutions were able to deliver the issues without the name field which I find to be quite a feat. Any subscriber members outside the USA who have not received issues 19 or 20 may check with their institution's mailroom or contact Peter Henn at Elsevier Science Ltd ([p.henn@elsevier.co.uk](mailto:p.henn@elsevier.co.uk)).
- (2) **Production Schedule.** There has been a delay in producing the first six issues of GCA due to a number of reasons. Issues 1 and 2 (January A and B) have mailed. Issue 3 (February A) will mail March 20. Issue 4 (February B) will mail March 27. Issues 5 and 6 (March A and B) will mail the first week of April. Then issues will be back on schedule.

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<http://www.pubcon.com> (under construction!)



## THE GEOCHEMICAL SOCIETY

### 1999 Officer and Director Candidates

The Geochemical Society has a 16-member Board of Directors composed of 9 Officer-Directors and 7 Non-officer Directors. The terms of Directors are either two years (President, Vice-President, Past-President, Organic Geochemistry Division Chair) or three years (all other Directors) and are staggered. Officer-Directors whose terms continue through at least 1999 are Michael J. Drake (President), Michael F. Hochella, Jr. (Vice-President), Donald Elthon (Treasurer), S. Ross Taylor (International Secretary), Alex N. Halliday (Past-President), Michael D. Lewan (OGD Chair), and Steven A. Macko (OGD Secretary). Non-officer Directors through at least 1999 are Lynn M. Walter, Jochen Hoefs, Albrecht W. Hofmann, R. Keith O'Nions, and Edward M. Stolper. Dr. Hofmann was appointed by the Board to serve the remainder of the term of Karl K. Turekian, since the Board unanimously voted in 1997 to eliminate the *Geochimica et Cosmochimica Acta* Executive Editorship as a Board-level position. Directors whose terms expire at the end of 1998 include David J. Wesolowski (Secretary), Scott M. McLennan (Special Publications Editor), Susan L. Brantley (Director), and Everett L. Shock (appointed by the Board to serve the remainder of Dr. Hochella's Director term, as he stepped into the Vice Presidency).

The By-Laws of the Geochemical Society require that its members be notified of the candidates for new Officers and Directors, who are proposed by the Nominations Committee and approved by the Board of Directors of the Society, well before the end of the calendar year in which Directors' terms expire. The purpose is to allow the general membership to nominate additional candidates for those positions that are up for election. Please consider the candidates listed below carefully and propose others only if you feel this is in the best interest of the Society.

Additional nominations may be made by at least ten (10) members of the Society, the nominees must be Society members, and they must agree to serve if nominated. **If you are satisfied with the proposed slate of officers and directors for 1999, do nothing. Additional nominations must be submitted by August 1, 1998,** to the Secretary of the Geochemical Society (Dr. David J. Wesolowski, Chemical and Analytical Sciences Division, Oak Ridge National Laboratory, P.O. Box 2008, Oak Ridge, Tennessee, 37831-6110, USA (Tel: 1-423-574-6903; Fax: 1-423-574-4961; Email: dqw@ornl.gov).

#### Proposed Slate of New Officers and Directors of the Geochemical Society

DIRECTORS: Kristin Vala Ragnarsdottir (1999-2001)  
Department of Geology  
University of Bristol  
Bristol, Avon, UK

Everett L. Shock (1999-2001)  
Dept. Earth and Planetary Sciences  
Washington University  
Saint Louis, Missouri, USA

OFFICERS: *For Secretary (1999-2001)*  
David J. Wesolowski  
Chemical and Analytical Sciences Div.  
Oak Ridge National Laboratory  
Oak Ridge, Tennessee, USA

*For Special Publications Editor (1999-2001)*  
Scott A. Wood  
Dept. Geology and Geol. Engineering  
University of Idaho  
Moscow, Idaho, USA

## The Mineralogical Society of America

announces the 1999

### GRANT FOR RESEARCH IN CRYSTALLOGRAPHY

*From the Edward H. Kraus Crystallographic Research Fund with contributions from the MSA membership and friends*

and

### MSA GRANT FOR STUDENT RESEARCH IN MINERALOGY AND PETROLOGY

*from an endowment created by contributions from the MSA membership*

**The Grant for Research in Crystallography** is a \$3500 grant for research in crystallography. There are no restrictions on how the grant funds may be spent, as long as they are used in support of research. The only restrictions on eligibility for the grant are that the applicant must have reached his or her 25th birthday but not yet have reached his or her 36th birthday on the date the grant is awarded, and that the person is not a MSA Counsellor. The award selection will be based on the qualifications of the applicant, the quality, innovativeness, and scientific significance of the proposed research, and the likelihood of success of the project. The next award will be made in January, 1999.

**MSA Grant for Student Research in Mineralogy and Petrology** is a \$3500 grant for research in mineralogy and petrology. Students, including graduate and undergraduate students, are encouraged to apply. There are no restrictions on how the grant funds may be spent, as long as they are used in support of research. The award selection will be based on the qualifications of the applicant, the quality, innovativeness, and scientific significance of the research, and the likelihood of success of the project. The next award will be made in January, 1999.

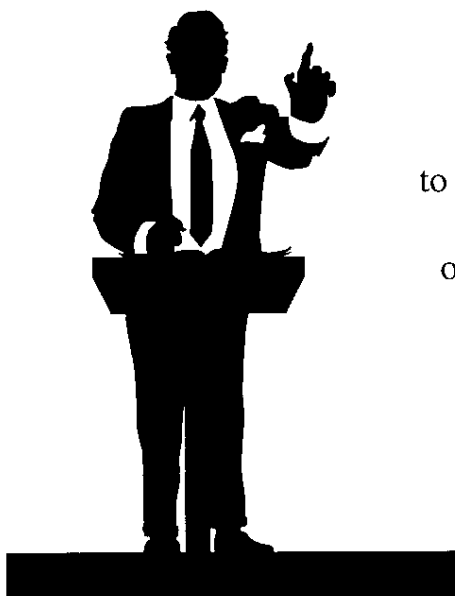
Application forms for both grants may be obtained from the MSA worldwide web home page, <http://www.minsocam.org>, or from Dr. J. Alex Speer, MSA Business Office, 1015 Eighteenth St., NW, Suite 601, Washington, DC, 20036-5274, USA (202-775-4344, fax 202-775-0018, [j\\_a\\_speer@minsocam.org](mailto:j_a_speer@minsocam.org)). Completed applications must be returned to the MSA Business Office by June 1, 1998.

### Authors wanted!

to write brief review articles, letters, and other communications  
of a timely nature for publication in *The Geochemical News*.

Please contact the Editor with your ideas for articles.

*(Where else can you get published within 3 months?)*



## 1998 GORDON RESEARCH CONFERENCE ON ORGANIC GEOCHEMISTRY

HOLDERNESS SCHOOL, NEW HAMPSHIRE, AUGUST 9-14, 1998

**Kenneth E. Peters, Chairman** (214-951-3272, [kepeters@dal.mobil.com](mailto:kepeters@dal.mobil.com))  
**John I. Hedges, Vice Chair** (206-543-0744, [jihedges@u.washington.edu](mailto:jihedges@u.washington.edu))

This conference is designed to stimulate discussion of cutting-edge research and improve cooperation among geochemists, microbiologists, geologists, chemists and others, especially in disciplines related to fossil fuels. Developments in organic geochemistry are critical to the world economy because they improve success in the exploration and production of fossil fuels. Generous discussion periods will follow each invited talk. All applicants are encouraged to submit posters to the Vice Chair.

Early application to this conference is strongly recommended. Application forms and the final program are available on the web at [HTTP://www.grc.uri.edu](http://www.grc.uri.edu). The following is an abbreviated summary of session topics and discussion leaders.

- **GEOCHEMICAL EVIDENCE FOR PAST LIFE ON MARS** (David DesMarais)
- **ORGANIC MATTER PRESERVATION IN SEDIMENTS** (Cindy Lee)
- **GEOCHEMISTRY OF HYDROTHERMAL ECOSYSTEMS AND DEEP-EARTH MICROBES** (Roger Summons)
- **CHEMOSTRATIGRAPHY AND THE GEOCHEMISTRY OF MAJOR TIME BOUNDARIES** (Lisa Pratt)
- **COMPUTATIONAL ORGANIC GEOCHEMISTRY** (Yungchun Tang)
- **THERMOCHEMICAL SULFATE REDUCTION** (Martin Fowler)
- **GENERATION AND PREDICTION OF HYDROCARBON GASES, CARBON DIOXIDE, AND NITROGEN** (Francois Lorant)
- **GENERATION AND EXPULSION OF HYDROCARBONS** (Dan Jarvie)
- **RESERVOIR FLUIDS, SEALS, AND DYNAMIC PROCESSES** (Peter Meulbroek)

### Great News . . . .

3,151 Abstracts Received for the 1998 Spring Meeting  
May 26-29, 1998                      Boston, Massachusetts

American Geophysical Union  
Mineralogical Society of America  
Geochemical Society  
American Astronomical Society/Solar Physics Division

Projected Attendance: 3,500 plus  
Housing and Preregistration Deadline: April 24, 1998

*Don't miss an opportunity to attend the largest Spring Meeting held to date!*

For information on Housing and Registration, please refer to the January 27 and February 24 issues of Eos, the AGU Web Site (<http://www.agu.org>), or contact the

AGU Meetings Department  
1998 Spring Meeting  
2000 Florida Avenue, NW  
Washington, DC 20009

Phone: +1-202-462-6900 (outside North America)  
1-800-966-2481 (toll free in North America)  
Fax: +1-202-328-0566  
E-mail: [meetinginfo@kosmos.agu.org](mailto:meetinginfo@kosmos.agu.org)

ANNOUNCING A TOPICAL CONFERENCE

***The Origin of the Earth and Moon***

December 1–3, 1998 ✧ Monterey, California

<http://cass.jsc.nasa.gov/meetings/origin98/>SPONSORS

Geochemical Society  
 Lunar and Planetary Institute  
 National Aeronautics and Space Administration

The 1988 conference *The Origin of the Earth* was an excellent meeting that produced a classic, frequently cited text on the subject. The 1984 conference *The Origin of the Moon* was arguably the most successful conference ever held in planetary geology, bringing together the key players who then and there formulated, debated, refined, and established the giant impact theory of lunar origin. In recent years there have been major advances in these areas, particularly in the fields of geochemistry and petrology. It has become very apparent that a meeting that focuses on the origin of the Earth and Moon, as coupled problems, would be invaluable. For example, discussions about the development of the Earth's atmosphere or hypotheses concerning magma oceans and core formation are esoteric unless constraints on the nature of the interactions that generated the Moon are incorporated. As such, we believe that this conference should focus on the very earliest histories of these bodies, so that nearly everyone present will share a common interest in all aspects of the discussion.

Therefore, this conference is being planned just prior to the 1998 Fall AGU Meeting in San Francisco to encourage interested scientists worldwide to attend and contribute to what we hope will be the third in a series of highly successful topical conferences on origins of planets.

For further information concerning the conference, and to be added to the mailing list for future announcements, please send your request to:

**The Origin of the Earth and Moon Conference**

Lunar and Planetary Institute  
 3600 Bay Area Boulevard  
 Houston TX USA  
 E-mail: [simmons@lpi.jsc.nasa.gov](mailto:simmons@lpi.jsc.nasa.gov)

CONVENERS

**Alex N. Halliday**  
 University of Michigan  
 E-mail: [anh@umich.edu](mailto:anh@umich.edu)

**Michael Drake**  
 University of Arizona  
 E-mail: [drake@lpl.arizona.edu](mailto:drake@lpl.arizona.edu)

SCIENTIFIC ORGANIZING COMMITTEE

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*Carnegie Institution of Washington*

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David J. Stevenson  
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H. Jay Melosh  
*University of Arizona*

S. Ross Taylor  
*Australian National University*

R. Keith O'Nions  
*Oxford University*



## Plan to Attend the Eighth Annual V.M. Goldschmidt Conference



**August 30 - September 3, 1998  
Toulouse, France**

The Eighth Annual V.M. Goldschmidt Conference will be held in Toulouse, France from Sunday August 30 to Friday September 3, 1998. The meeting will be followed by optional field excursions to the neighboring Pyrénées mountains. This will be the first time that the Goldschmidt will be held in France. The location of the meeting, Toulouse is a university town known for its tradition of culture and 'art de vivre'.

Toulouse, known as 'la ville rose' because of its magnificent brick-based architecture, is the fourth largest city in France. Situated in the south of France, Toulouse is located west of the Mediterranean Sea (90 miles/150 kilometers) and east of the Atlantic Ocean (150 miles/250 kilometers). Summer weather in Toulouse is typically pleasant and sunny, with daytime temperatures ranging from 75° F/24° C to 85° F/30° C.

The Goldschmidt 1998 Conference Venue, Université de Toulouse I, is located in the city center, close to hotels, restaurants, outdoor cafés, shopping, and several historical monuments and museums. The University of Toulouse is the second largest in France; the campus is surrounded by churches, monasteries, and houses dating from the 11<sup>th</sup> to 17<sup>th</sup> centuries. The area surrounding Toulouse is equally interesting. Several exciting touristic destinations are within a very short distance: the medieval city of Carcassone, the Perigord and Dordogne valleys, and the Pyrénées Mountains.

The Conference is organized by the Observatoire de Midi-Pyrénées, an institution dedicated to teaching and research in Earth and Planetary Science, ranging from extra-galactic astronomy to the internal structure of the Earth. If you are interested in obtaining information regarding the conference, send an e-mail message to the organizers([goldconf@lucid.ups-tlse.fr](mailto:goldconf@lucid.ups-tlse.fr)) or visit the web site at <http://www.obs-mip.fr/omp/umr5563/goldconf98.html>.

### Hosted by

Observatoire de Midi-Pyrénées  
Institut des Sciences de la Terre  
CNRS/Université Paul-Sabatier

### Sponsored by

European Association of Geochemistry  
Geochemical Society  
Université Paul-Sabatier  
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### Schedule

April 3, 1998  
June 1998  
August 30-September 3, 1998

Abstract deadline  
Final Announcement/Program  
Eighth Annual V. M. Goldschmidt Conference



### **Karl Turekian wins Wollaston Medal**

*Professor Karl K. Turekian of Yale University is to be awarded the Wollaston Medal of the Geological Society (UK) on April 16, 1998. In more than forty years of research, over 200 papers and six books, Karl Turekian has laid the foundations of a vast array of geochemical solutions to problems in the earth and ocean sciences. His PhD work, at Columbia University, contributed to the use of strontium isotope ratios in the understanding of the earth's environmental history. He joined the faculty at Yale in 1956 and, with the exception of periods of sabbatical at Cambridge (Scripps Institution of Oceanography) and Caltech, has remained there since.*

*Apart from his academic distinctions (for which he has been honored by election to the US National Academy of Sciences, and awards by the Geochemical Society and the American Geophysical Union), Professor Turekian has been a great servant of the earth science community. From 1975 to 1989 he was an Editor of Earth and Planetary Science Letters, where he helped make that journal into one of the most prestigious in the earth sciences. He performed the same role for Global Biogeochemical Cycles, and has recently*

*taken over the helm of Geochimica et Cosmochimica Acta. He was President of the Geochemical Society in the mid-70's and has served on a number of committees of the US National Research Council. On the international scene, he has also been a member of UN committees, and of the US-USSR Committee on Marine Pollution.*

*On a personal note, Karl (an Armenian by ancestry who developed a legendary appetite for American doughnuts in his fabled coffee sessions) is renowned as a tough inquisitor. This has been witnessed by academics in university departments undergoing external review, and also at Yale where he is noted for his cross-examination of seminar speakers on almost any subject.*

---

### **Response to the Wollaston Medal citation**

#### **Karl K. Turekian**

Mr. President, ladies and gentlemen, it gives me great pleasure to accept the Wollaston Medal for 1998.

As a geochemist I was impressed by the fact that Wollaston, among his many exploits, pursued the study of the cycles of the elements at the Earth's surface. He lived at a time when the discovery and description of the elements was proceeding at a rapid clip. Wollaston discovered palladium and rhodium in 1802 and 1803 respectively. At the same time Smithson Tennant discovered osmium, an element to which I will return later. Indeed for a while in the middle of the last century the Wollaston Medal was made of palladium to recognize this fact although the medal was originally made of gold.

In 1807 Humphry Davy isolated and described potassium in the ash of trees. Tree ash was known for some time as a source of material for glass manufacture and the production of basic solutions. Here is where Wollaston's geochemical instinct came through. A few years after the discovery of potassium, Wollaston figured out that if plants concentrate potassium then the eventual decay of the plants without direct ashing should release potassium to surface streams. These streams would transport potassium to the oceans and therefore sea water should be rich in potassium. He analyzed sea water from a depth of 80 fathoms obtained on an expedition to Baffin's Bay by Captain (later, Sir) John Ross, the uncle of Sir James Clark Ross after whom the Ross Sea in Antarctica is named. He used

the precipitate made by potassium with the addition of a platinum solution to a partially evaporated sample of sea water to obtain gravimetrically the amount of potassium in a known volume. The concentration of potassium he obtained is within a factor of three of the presently obtained precise measurements. (I owe the introduction to this paper by Wollaston that appeared in the Edinburgh Philosophical Journal in 1820 to Valerie and Harmon Craig).

The roll call of elements that were discovered year by year included rubidium in 1861 following strontium which was identified in 1808 and rhenium relatively of late recognition in 1925. The relationship between rubidium and strontium and rhenium and osmium had to wait until the work of the twentieth century that revealed the existence of isotopes. Nevertheless the shoulders of the giants of that time were clothe with elements and only by standing on these shoulders did the later exploitation of the elements via their isotopes occur. For amongst the isotopes of rubidium one was radioactive (Rb-87) and gave rise to an increase in the isotopic abundance of one of the isotopes of strontium (Sr-87) where the two occurred together, and likewise a radioactive isotope of rhenium (Re-187) gave rise to an increase of an isotope of osmium (Os-187). These coupled isotope/element systems profoundly affected our view of the cycles of the elements at Earth's surface as well as the interior not to speak of the cosmos itself!

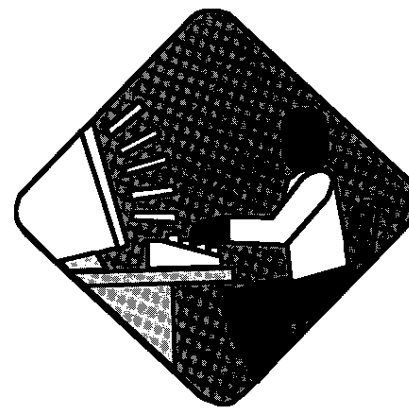
I started my life as a graduate student at Columbia University trying to use the putative increase of Sr-87 with time in the oceans as a chronometer preserved in limestones only to be frustrated by the complexities hidden in the realities of terrestrial processes. We now know that the relative amounts of different types of rock undergoing weathering and alteration over time are the more important controls on the composition of sea water rather than time alone. I have been recently involved with the variations of the the Os-187 to Os ratio in the oceans over time fully aware that what was made evident for strontium was also binding on the Os-Re system. The rock types were different but the principle remained the same. Whereas the Sr-87 to strontium ratio was a titration of the weathering of continental granitic terraines against oceanic basalt alteration, the Os-187 to osmium ratio was controlled by the relative importance of weathering continental terraine and ultramafic rocks whether at convergence zones or certain spreading centers.

All of this work had its origin ultimately in the type of insights of people like Wollaston who early recognized the

intimate relationship between weathering and organisms and the subsequent imprint on the oceans.

I am grateful to the culture in which I was nurtured that argued that geochemistry is fundamentally an arm of geology and cosmology. The aim of all earth science approaches is to understand how Earth and the planetary system came into existence and is maintained. I cannot easily separate, in my mind, atmospheric transport processes, the nature of ocean circulation, the weathering of continents and the activity at ocean spreading centers and their associated hydrothermal vents. Fortunately the radioactive isotopes of the uranium and thorium decay chains as well as cosmogenic nuclides have provided additional tools in the study of these contemporary processes just as the radiogenic isotopes Sr-87 and Os-187 have provided insights to surficial processes resulting from long timescale tectonic processes.

Radioactive, radiogenic and light stable isotopes are the tools provided to geology by geochemists to aid in the struggle to wrench knowledge from Earth (as it says in the King James version translation of the Book of Job: "speak to the earth and it shall teach thee"). It is a happy alliance and I rejoice in being a co-conspirator in this enterprise. It is the activities of my colleagues, friends, competitors and students (not necessarily distinguishable) that has inspired my own work in geochemistry. I am grateful to them as I accept this medal from you.



visit the new Geochemical Society website:

<http://www.geochemsoc.org>



## The Geochemical Society 1999 Awards Nominations

### V.M. Goldschmidt Award

The V.M. Goldschmidt Award shall be made for major achievements in geochemistry or cosmochemistry, consisting of either a single outstanding contribution, or a series of publications that have had great influence on the field. The award will normally be given annually at the V.M. Goldschmidt Conference. Current members of the Geochemical Society Board of Directors and past recipients of the award are ineligible for nomination. Awards are based solely on scientific merit, without regard to citizenship or membership in the Society.

**Past Recipients:** P.W. Gast (1972), R.M. Garrels (1973), H.E. Suess (1974), H.C. Urey (1975), H.P. Eugster (1976), S. Epstein (1977), G.J. Wasserburg (1978), H. Craig (1979), C.C. Patterson (1980), R.N. Clayton (1981), K.B. Krauskopf (1982), S.S. Goldich (1983), A.O. Nier (1984), J.B. Thompson (1985), C.J. Allégre (1986), W.S. Broecker (1987), H.C. Helgeson (1988), K.K. Turekian (1989), E. Anders (1990), A.E. Ringwood (1991), S.R. Hart (1992), S.R. Taylor (1993), H.D. Holland (1994), R. Berner (1995), A.W. Hofmann (1996), D. Lal (1997), W. Stumm (1998)

Nominations should specify the name, address, and chief fields of specialization of the nominee, and be accompanied by a curriculum vitae and bibliography of the nominee, limited to two pages each, and up to three supporting letters. Nominations should also be accompanied by a letter from the nominator giving name, address, phone number, signature, and a brief summary of why the candidate is suitable for the award.

**Nominations for the 1999 V.M. Goldschmidt Award should be submitted before October 1, 1998, to:**

Dr. Miriam Kastner	Tel: 1-619-534-2065
Scripps Inst. Oceanography, 0212	Fax: 1-619-534-0784
9500 Gilman Drive	E: mkastner@ucsd.edu
La Jolla, California 92093, USA	

### F. W. Clarke Award

The F.W. Clarke Award shall normally be made annually at the V.M. Goldschmidt Conference to an early-career scientist for a single outstanding contribution to geochemistry or cosmo-chemistry, published either as a single paper or a series of papers on a single topic. Candidates must have held a recognized doctorate or its equivalent for no more than six (6) years, or be not more than thirty-five (35) years of age, whichever anniversary date is later in the year of the nomination deadline. Current members of the Board of Directors and past recipients of the award are ineligible for nomination. The Clarke and Patterson medals cannot be awarded for the same accomplishment. Awards are based solely on scientific merit, without regard to citizenship or membership in the Society.

**Past Recipients:** D.A. Papanastassiou (1972), H. Ohmoto (1973), L. Grossman (1974), D. Walker (1975), J.R. Wood (1976), B. Mysen (1977), D.J. DePaolo (1978), A.C. Lasaga (1979), R.W. Potter (1980), J.F. Minster (1981), P.J. Patchett (1982), E.B. Watson (1983), A. Mackenzie (1984), E.M. Stolper (1985), M.D. Kurz (1986), E. Takahashi (1987), F.M. Phillips (1988), R.J. Walker (1990), D. Sherman (1991), E. Klein (1992), Y. Zhang (1993), C. Agee (1994), R. Lange (1995), P.M. Dove (1996), J. Blundy (1997), M. Humayun (1998)

Nominations should specify the name, address, and chief fields of specialization of the nominee, and be accompanied by a copy of the paper(s) for which the nominee is being considered for the award, and up to three supporting letters. Nominations should also be accompanied by a letter from the nominator giving name, address, phone number, and signature, together with a brief statement explaining the significance of the nominee's work. This letter should also specify the nominee's date of birth and final degree received, the degree advisor's name, the year granted, and the name of the granting institution.

**Nominations for the 1999 F.W. Clarke Award should be submitted before October 1, 1998, to:**

Dr. Samuel Traina	Tel: 1-614-292-9037
School of Natural Resources	Fax: 1-614-292-7432
Ohio State University	Email: traina.1@osu.edu
210 Kottman Hall, 2021 Coffey Road	
Columbus, Ohio 43210, USA	

### Alfred E. Treibs Award

The Organic Geochemistry Division (OGD) of the Society bestows this award, for major achievements in organic geochemistry. A separate nominations call will be announced, and inquiries may be made to OGD Secretary Steven A. Macko, Dept. Environmental Science, University of Virginia, Charlottesville, Virginia 22903, USA (Phone: 1-804-924-6849; Fax: 1-804-982-2137; Email: sam8f@virginia.edu).

### Clair C. Patterson Award

This is a new award of the Geochemical Society, for a recent innovative breakthrough in environmental geochemistry of fundamental significance, published in a peer-reviewed journal. Nominations are still open for the 1998 award, which will normally be made biennially at the V.M. Goldschmidt Conference. The award has no age or career stage restrictions, but the Clarke and Patterson medals cannot be awarded for the same accomplishment. Members of the Geochemical Society Board of Directors and past recipients of the award are ineligible for nomination.

Nominations should include the name, address, and chief fields of specialization of the nominee, and be accompanied by a curriculum vita of not more than two pages, a list of no more than 10 peer-reviewed publications relevant to the accomplishment being recognized, and up to three support letters. Nominators should include a letter of not more than two pages, giving name, address, phone number, signature, and a brief description of the nominee's contribution to environmental geochemistry.

**Nominations for the 1998 Clair C. Patterson Award should be submitted before May 1, 1998, to:**

Dr. Alex N. Halliday	Tel: 1-313-936-3601
Department of Geological Sciences	Fax: 1-313-763-4690
The University of Michigan	E: anh@umich.edu
2534 C. C. Little Building	
Ann Arbor, MI 48109-1063, USA	

### *Call for Nominations for 1999 Joint EAG-GS Geochemistry Fellows*

The European Association for Geochemistry (EAG) and the Geochemical Society (GS) established in 1996 the honorary title of Geochemistry Fellow, to be bestowed upon outstanding scientists who have, over some years, made a major contribution to the field of geochemistry. Existing and new Urey, Goldschmidt and Treibs Medal winners become Fellows automatically. Approximately 15 new Fellows will be elected each year, representing about 0.5% of the combined membership. However, membership in either organization is not a factor in consideration of Fellows candidates. Current members of the Fellows Selection Committee, the GS Board of Directors, and the EAG Council are ineligible for nomination. Any member of either organization may nominate Fellows by right.

Nominations should include the name, address, telephone number and email address of the nominee, a citation of no more than two pages describing the contributions the individual has made to geochemistry, and up to three letters of support from members of either society. The nomination should also include the nominator's name, address, telephone number, and signature.

**Nominations should be sent no later than October 1, 1998 to:**

Dr. Terry M. Seward	Tel. 41-1-632-2227
Institut für Mineralogie und Petrographie	Fax: 41-1-632-1088
ETH-Zentrum	Email: tseward@erdw.ethz.ch
CH-8092, Zürich	
Switzerland	

#### Geochemistry Fellows (excluding Urey, Goldschmidt, and Treibs Medalists)

**1996** William Compston, Willi Dansgaard, John Edmond, John M. Hayes, Marc Javoy, Ho-Kwang Mao, Stephen Moorbath, John Reynolds, Jean-Guy Schilling, Nick Shackleton, Mitsunobu Tatsumoto, Werner Stumm, George Tilton, Grenville Turner, Heinrich Wänke, William White

**1997** Philip Abelson, Jan Bottinga, Ian Carmichael, Donald J. DePaolo, Bruno J. Giletti, Tom Krogh, Ikuo Kushiro, Gunter W. Lugmair, Fred T. Mackenzie, Alexandra Navrotsky, Michael O'Hara, Keith O'Nions, Denis M. Shaw, Edward M. Stolper, George W. Wetherill, Derek York

**1998** Thomas J. Ahrens, Francis Albarede, Michael L. Bender, Edward A. Boyle, Eric M. Galimov, John I. Hedges, Miriam Kastner, Yehoshua Kolodny, Charles H. Langmuir, Antonio C. Lasaga, James R. O'Neil, George Parks, James C.G. Walker, David Walker, E. Bruce Watson, Bernard J. Wood, Jan Veizer, Ernst Zinner



Kenneth S. Pitzer, Chemist and Science Leader  
1914-1997

Kenneth S. Pitzer, professor emeritus of Chemistry at UC Berkeley, died of heart failure on December 26 after a brief illness at the age of 83. Professor Pitzer was well known among geochemists (1) for his textbook on Thermodynamics (1961 and 1995), (2) for the "Pitzer" equations, formulations for ion-interactions in concentrated aqueous solutions, which provide the key to mineral equilibria in natural brines, and (3) for his equations-of-state for vapor-liquid relations in salt solutions. I was privileged to collaborate with him over the past 12 years on issues of phase-separation and critical phenomena in saline solutions. These issues had direct application to seafloor geothermal systems, and to hydrothermal processes in general. As I was to discover, his work on ionic solutions, so greatly appreciated by geochemists, represented only a small part of his scientific contributions in a complex and rich career.

Born in Pomona, California in 1914 he achieved exceptional distinction not only as a scientist, but also as an administrator, public servant, and philanthropist. One of the greatest physical chemists of this century, he played a leading intellectual role in developments of nearly every facet of chemistry. Graduating from Cal. Tech. in 1935, he came to Berkeley where he received his doctorate in two years. He was immediately invited to join the faculty where he spent most of his career, including a stint as Dean of the College of Chemistry, and also Chairman of the Academic Senate. But he had noteworthy leaves of absence from the Berkeley scene, twice to serve his country, and twice to be Presi-

dent of major research universities, Rice and Stanford. From 1943 to 1944 he was Technical Director of the wartime Maryland Research Laboratory, and from 1949 to 1951 he was the first Director of Research of the Atomic Energy Commission where he played a pivotal role in the development of the hydrogen bomb. Later, (1961-1968) he served as President of Rice University where he facilitated its evolution from a local engineering school to an internationally renowned university with Nobel laureates to its credit (one of whom is Robert F. Curl, Jr., who had obtained his doctorate under Pitzer at UC Berkeley). Of his achievements at Rice, he was personally most proud of instituting and nurturing racial integration at the previously whites-only institute. He then served briefly as president of Stanford University (1968-1970). But success eluded him at Stanford, where he ran afoul of violent student protests against the Vietnam War. Ironically, he was personally against the war during this time, and was sympathetic to the student movement. He resigned after two years to return to Berkeley as Professor until his "retirement" in 1984. Retirement is in quotes because nearly half of his scientific publications date from then. But even during his demanding administrative posts, he somehow found time to conduct research and continue his pace of publication. During his final years as an emeritus professor when I began collaborating with him, I was impressed by his high energy and enthusiasm for research. Mentoring and financially supporting a small group of post docs from all over the world, he managed to continue to publish 5-10 papers a year, while enjoying travel and leisure time with his wife Jean, their three grown children and five grandchildren. The enthusiasm he held for research was reflected in his leisure activities, highlighted by his love of sailing. He designed and constructed several boats, and he was licensed by the Coast Guard as a boat designer and builder.

Pitzer's research centered on the structure and properties of molecules, and he was widely known early in his career for his analysis of internal rotation of groups within molecules. His research included quantum theory and statistical mechanics as applied to chemical problems ranging from the rotation about single bonds to the bonding in polyatomic carbon molecules, and to the effects of relativity on chemical bonds of very heavy atoms. In later years he was noted for his advances in the study of electrolyte solutions which brought him fame in the geochemical community.

Pitzer was honored with more than a dozen awards in his lifetime, including the National Medal of Science (1975), The Priestley medal (1969) and the Willard Gibbs medal (1975) of the American Chemical Society. He was a member and past chairman of the National Academy of Sciences, and held honorary degrees from several universities. His journal articles number 390, and at this writing eight articles are "in press", two of which will appear in *Geochimica et Cosmochimica Acta*. His books include "Quantum Chemistry" (1953), "Thermodynamics" (1961, with Leo Brewer, revised edition of Lewis and Randall), "Activity Coefficients in Electrolyte Solutions" (1992), "Molecular Structure and Statistical Thermodynamics" (1993), and "Thermodynamics" (1995).

James L. Bischoff

## Meetings Calendar

**Apr. 13-17, 1998: Seventh International Kimberlite Conference**, Rondebosch, South Africa, Field trips between the April 6-12 and 19-24, 1998. Abstract deadline? Contact: James Gurney, Secretary/Treasurer, 7IKC, Department of Geological Sciences, University of Cape Town, Private Bag, Rondebosch, 7700, South Africa. Tel: +27 21 531 3162 or +27 82 550 2004; Fax: +27 21 650 3783; Email: 7IKC@GEOLOGY.UCT.AC.ZA.; <http://www.ucl.ac.za/depts/geolsci/7ikc/>

**Apr. 20-24 and Apr. 27-May 1: ICDD Clinic on X-ray Fluorescence Spectrometry**, Newtown Square, PA USA, Manager, Schools and Conferences, International Centre for Diffraction Data, 12 Campus Blvd., Newtown Square, PA 19073-3273. Tel: +1-610-325-9814; Fax: +1-610-325-9823; Email: CLINICS@ICDD.COM

**April 20-24, 1998: European Geophysical Society**, Nice, France. Contact: EGS Office, Max-Planck-Str. 13, 37191 Katlenburg-Lindau, GERMANY. Tel: +49-5556-1440; Fax: +49-5556-4709; Email: EGS@COPERNICUS.ORG; <http://www.copernicus.org/EGS/EGS.html>

**Apr. 27-30, 1998: International Conference on Modern Preparation and Response Systems for Earthquake, Tsunami, and Volcanic Hazards**, Santiago, Chile. Contact: B. Bolt, Dept. Of Geology and Geophysics, University of California, Berkeley, CA USA. Fax: 510-845-4816; Email: boltuc@socrates.berkeley.edu

**May 3-7, 1998: 34th Forum on the Geology of Industrial Minerals**, Norman, OK USA. Contact: Kenneth S. Johnson, Oklahoma Geological Survey, University of Oklahoma, 100 E. Boyd St., Room N-131, Norman, OK 73019 USA. Tel: 405-325-3031 or 800-330-3996; Fax: 405-325-7069.

**May 5-8, 1998: Fractal Scaling, Non-Linear Dynamics, and Chaos in Hydrologic Systems**, Anderson, SC USA (Clemson University). (Abstract deadline: Jan. 8, 1998) Contact: AGU Meetings Dept., 2000 Florida Avenue, NW, Washington, DC 20009 USA. Tel: 202-462-6900 or 800-966-2481 (North America only); Fax: 202-328-0566; Email: meetinginfo@kosmos.agu.org; <http://www.agu.org>

**May 13-15, 1998: Advances in Fluid Mechanics (AFM 98)**, Udine, Italy. Contact: P. Doughty-Young, AFM 98, Wessex Institute of Technology, Ashurst Lodge, Ashurst, Southampton, 2040 7AA UK. Tel: 44-1703-293-223; Fax: 44-703-292-853; Email: paula@wessex.ac.uk; <http://www.wessex.ac.uk/>

**May 14-18, 1998: Linking Spatial and Temporal Scales in Paleoecology and Ecology**, Annapolis, MD USA. Contact: A. Cohen, Dept. Of Geosciences, University of Arizona, Tucson, AZ 85721 USA. Tel: 520-621-4691; Fax: 520-621-2672; Email: acohen@geo.arizona.edu

**May 18-20, 1998: Quebec Canada Joint Meeting Geological Association of Canada, Mineralogical Association of Canada, and Association Professionnelle des Geologues et des Geophysiciens du Quebec**. Contact: Agathe Morin, Dept. Of Geology, Universite Laval, Pavillon Adrien-Pouliot, Sainte-Foy Quebec G1K 7P4, Canada. Tel: 418-656-2193; Fax: 418-656-7339; Email: quebec1998@ggl.ulaval.ca; <http://www.ggl.ulaval.ca/quebec1998.html>

**May 18-21, 1998: First International Conference on Remediation of Chlorinated and Recalcitrant Compounds**, Monterey, CA, USA. Contact: J. Purvis, The Conference Group, Inc., 1989 West Fifth Ave., Suite 5, Columbus, OH 43212-1912 USA. Tel: 800-783-6338 or 614-424-5461; Fax 614-488-5747.

**May 22-27, 1998: European Research Conference on the Geochemistry of Crustal Fluids: Reactive Transport in Natural Systems**, Aghia Pelaghia, Crete, GREECE. Contact: Eric H. Oelkers, Laboratoire de Geochimie, Universite Paul Sabatier, 31000 Toulouse France. Tel: 33 5.61.55.87.85; Fax: 33 5.61.52.05.44; Email: oelkers@cict.fr

**May 26-29, 1998: Spring AGU Meeting**, Boston, MA USA. Abstract Deadline: Feb. 19, 1998 (by mail) or Feb. 26, 1998 (via WWW). Contact: AGU Meetings Dept., 2000 Florida Ave. NW, Washington, DC 20009. Tel: 800-966-2481 or 202-462-6910, ext. 215; Fax: 202-328-0566; Email: meetinginfo@kosmos.agu.org (subject: 1998 Spring Meeting); <http://earth.agu.org/meetings>

**June 1-4, 1998: Pan American Current Research on Fluid Inclusions (PACROFI) VII**, Las Vegas, NV USA. Contact: Jean S. Cline; Dept. of Geosciences; University of Nevada-Las Vegas; Las Vegas, Nev. 89154-4010 USA. Fax: +1-702-895-4064; Email: jcline@nevada.edu

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**June 1-5 and 8-12: ICDD Clinic on X-ray Powder Diffraction**, Newtown Square, PA USA, Manager, Schools and Conferences, International Centre for Diffraction Data, 12 Campus Blvd., Newtown Square, PA 19073-3273. Tel: +1-610-325-9814; Fax: +1-610-325-9823; Email: CLINICS@ICDD.COM

**June 4-12, 1998: Evolution of Ocean Island Volcanoes**, Galapagos Islands, Ecuador. (Abstract deadline: Jan. 15, 1998) Contact: Dennis Geist, Dept. Of Geology, University of Idaho, Moscow, ID 83844. Tel: 208-885-6491; Fax: 208-885-5724; Email: dgeist@uidaho.edu

**June 16-20, 1998: 8<sup>th</sup> Pacific Congress on Marine Science and Technology**, Seoul, Korea. (Abstract deadline: Jan. 15, 1998) Contact: PACON International, P. O. Box 11568, Honolulu, HI 96828. Tel: 808-956-6163; Fax: 808-956-2580.

**June 23-27, 1998: 7<sup>th</sup> International Conference on Permafrost**, Yellowknife, Canada. Contact: J. A. Heginbottom, Geological Survey of Canada, 601 Booth St., Ottawa, Ontario, Canada K1A 0E8. Tel: 613-992-7813, Fax 613-992-2468; [http://www.ncrcan.gc.ca/gsc/permaf\\_e.html](http://www.ncrcan.gc.ca/gsc/permaf_e.html)

**June 29-July 15, 1998: 8<sup>th</sup> International Platinum Symposium (IAGOD/CODMUR)**, Johannesburg, South Africa. Contact: Dr. C. A. Lee, P.O. Box 68108, Bryanstown, South Africa. Tel: +27 1127 373 2580; Fax: +27 1127 836 0371; Email: clee@amplats.co.za

**July 4-11, 1998: Processes of Crustal Differentiation (Geological Society of America)**, Verbania, Italy. Contact: Tracy Rushmer, Dept. Of Geology, University of Vermont, Burlington, VT 05405 USA. Tel: 802-656-8136; Fax: 802-656-0045; Email: trushmer@zoo.uvm.edu

**July 6-10, 1998: Australian Geological Convention**, Townsville, Australia. Contact: Debbie Buckley, School of Earth Sciences, James Cook University, Townsville QLD 4811, Australia. Tel: +61 077 81 5047; Fax: +61 077 25 1501; Email: [jcu.edu.au](mailto:jcu.edu.au); <http://www.jcu.edu.au/dept/Earth//AGC14.html>

**July 7-14, 1998: Coupled Ocean-Atmosphere Response Experiment '98 (COARE98)**, Boulder, CO USA. Contact: B. Jackson, University Corporation for Atmospheric Research/Joint Office for Science Support Program Support Group, P.O. Box 3000, Boulder, CO 80307-3000 USA. Tel: 303-497-8663; Fax: 303-497-8633; Email: [bjackson@ucar.edu](mailto:bjackson@ucar.edu); [http://www.joss.ucar.edu/joss\\_psg/project/coare98/](http://www.joss.ucar.edu/joss_psg/project/coare98/)

**July 11-17, 1998: IAVCEI International Volcanological Congress '98**, Rondebosch, South Africa. Contact: Secretariat, IAVCEI 1998, Dept. Of Geological Sciences, University of Cape Town, Rondebosch, South Africa. Fax: +27 21 650 3783; Email: [ivc98@geology.uct.ac.za](mailto:ivc98@geology.uct.ac.za); <http://www.uct.ac.za/depts/geolsci/ivc98/>

**July 21-24, 1998: 1998 Western Pacific Geophysics Meeting**, Taipei, Taiwan. Contact: Tel: 800-966-2481 or 202-462-6900; <http://www.agu.org> (Click on Meetings, Click on 1998 Western Pacific Geophysics Meeting).

**Aug. 5-8, 1998: Eighth International Symposium on Solubility Phenomena**, Niigata, Japan. Contact: Kiyoshi Sawada, General Secretary of the 8<sup>th</sup> ISSP, Dept. Of Chemistry, Faculty of Science, Niigata University, Niigata 950-21, Japan. Tel: +81 25 262 6265; Fax: +81 25 262 6116; Email: [issp@sc.niigata-u.ac.jp](mailto:issp@sc.niigata-u.ac.jp)

**Aug. 9-12, 1998: 4<sup>th</sup> International Symposium on Environmental Geotechnology and Global Sustainable Development**, Boston, MA USA. (Abstract deadline: Nov. 15, 1997). Contact: H. I. Inyang, Center for Environmental Engineering and Science Technologies, James B. Francis College of Engineering, University of Massachusetts-Lowell, One University Avenue, Lowell, MA 01854 USA. Tel: 508-934-2285; Fax: 508-934-3092; Email: [inyangh@woods.uml.edu](mailto:inyangh@woods.uml.edu)

**Aug. 9-14, 1998: International Mineralogical Association: IMA '98, 17<sup>th</sup> General Meeting**, Toronto, Canada. Contact: Professor A. J. Naldrett, Dept. Of Geology, University of Toronto, Canada M5S 3B1. Tel: 461-978-3030; Fax: 416-978-3938; Email: [ima98@quartz.geology.utoronto.ca](mailto:ima98@quartz.geology.utoronto.ca)

**Aug. 10-16, 1998: International Ophiolite Symposium and Field Excursion; Generation and Emplacement of Ophiolites Through Time**, Oulu, Finland. Contact: Jouni Vuollo, Dept. Of Geology, University of Oulu, FIN-90570 Oulu, Finland; Fax: +358-81-5531484; Email: [vuollo@sveka oulu.fi](mailto:vuollo@sveka oulu.fi) or Eero Hanski, Geological Survey of Finland, P.O. Box 77, FIN-96101 Rovaniemi, Finland. Fax: +358-60-3297289; Email: [eero.hanski@gsf.fi](mailto:eero.hanski@gsf.fi)



**Aug. 15-20, 1998: Sixth International Congress on History of Oceanography**, Qingdao, China. (Abstract deadline: Nov. 30, 1997). Contact: G.-K. Tan, First Institute of Oceanography, SOA, 3A Hongdao Branch Road, Qingdao 266003, P. R. China. Tel: + 86-532-2883127; Fax: + 86-532-2879562; Email: fiokjc@ns.qd.sd.cn

**Aug. 17-20, 1998: The Second International Conference on Climate and Water**, Espoo, Finland. Contact: N. Helenius, Helsinki University of Technology, Water Res. Eng., Tietotie 1, FIN-02150 Espoo, Finland. Tel: + 358 9 275 3835; Fax: + 358 9 451 3827; Email: nheleniu@ahiti.hut.fi; <http://ahiti.hut.fi/wr/caw2>

**Aug. 19-25, 1998: Global Atmospheric Chemistry and Climate**, Seattle, WA USA. Contact: Patricia Quinn, CACGP/ICAG Meeting - 1998, NOAA/PMEL OCRD, Bldg. 3, 7600 Sand Point Wa NE, Seattle, WA 98115 USA. Fax: 206-526-6744; Email: [quinn@pmel.noaa.gov](mailto:quinn@pmel.noaa.gov)

**August 20-26, 1998: 9th International Conf. on Geochronology, Cosmochronology & Isotope Chemistry (ICOG-9)**, Beijing, China. Abstract Deadline: Mar. 1, 1998. Contact: ICOG-9 Secretariat, Chinese Academy of Geological Sciences, Baiwanzhuang Road 26, Beijing 100037, P.R. China. Tel: +86-(10)-6831-1545 and +86-(10)-6832-6456; Fax: 86-(10)-6831-1545; e-mail: [liudunyi@public.bta.net.cn](mailto:liudunyi@public.bta.net.cn); WWW: <http://www.cags.net.cn>

**Aug. 30-Sep. 3, 1998: 8th Annual V.M. Goldschmidt Conference**, Toulouse, France. <http://www.obs-mip.fr/omp/umr5563/goldconf98.html> [*see p. 10, this issue*]

**Aug. 30-Sep. 4, 1998: Clay Mineralogy and Petrology Conference and Workshop**, Brno, Czech Republic, by International Geological Correlation Programme Project No. 405. Contact: Petr Sulovsky, Dept. Of Mineralogy, Petrology, and Geochemistry, Faculty of Science, Masaryk University, Kotlarska 2, CZ 611 37 Brno, Czech Republic. Fax: + 420 541211214; Email: [clays@sci.muni.cz](mailto:clays@sci.muni.cz)

**Sept. 7- 9, 1998: Microscopic Properties and Processes in Minerals**, NATO Advanced Study Institute, Lucca, Italy. Contact: Prof. Catlow Royal Institution, Albemarle St., London W1X 4BS England. <http://www.esc.cam.ac.uk/nato/>

**Sept. 12-18, 1998: European Union**, Università di Siena - Vrije Universiteit Amsterdam - Universitetet i Oslo, SOCRATES - Intensive Programme, Modern Trends in Fluid-Phase Petrology. Contact: Maria-Luce Frezzotti, Dipartimento Scienze Terra, Via delle Cerchia n.3, 53100 Siena, Italy. Tel: +39 577 298915; Fax: +39 577 298815; Email: [frezzotti@dst.unisi.it](mailto:frezzotti@dst.unisi.it)

**Sep. 21-25, 1998: GQ '98: International Conference and Special Workshops on Groundwater Quality: Remediation and Protection**, Tübingen, Germany. Contact: Conference Secretariat GQ '98, c/o Lehrstuhl für Angewandte Geologie, Sigwartstrasse 10, D-72076 Tübingen, Germany. Tel: + 49-7071-2974692; Fax: + 49-7071-5059; Email: [mike.herbert@uni-tuebingen.de](mailto:mike.herbert@uni-tuebingen.de)

**Oct. 6-10, 1998: GEO-BERLIN '98, A joint meeting of Deutsche Geologische Gesellschaft, Deutsche Mineralogische Gesellschaft, and other geoscientific societies**, Berlin, Germany, Abstract Deadline: Mar. 1, 1998, Contact: Frau Kaiser, Tel: (+49)-30-314-21457; Fax: (+49)-30-314-24087; Email: [kaiser@wtb.zuv.tu-berlin.de](mailto:kaiser@wtb.zuv.tu-berlin.de)

**Oct. 26-29, 1998: 1998 GSA Annual Meeting**, Toronto, Canada. Contact: GSA, 3300 Penrose Place, Boulder, CO 80301 USA. Tel: 303-447-2020; Fax: 303-447-1133; <http://www.geosociety.org/meetings/index.htm>

**Dec. 1-3, 1998: The Origin of the Earth and Moon, Geochemical Society Topical Conference**, Monterey, CA USA. Contact: LPI; 3600 Bay Area Blvd.; Houston, TX USA. Email: [simmons@lpi.jsc.nasa.gov](mailto:simmons@lpi.jsc.nasa.gov) [*see p. 8, this issue*]

**Dec. 6-10, 1998: Fall AGU Meeting**, San Francisco, CA USA. Contact: AGU Meetings Dept., 2000 Florida Ave. NW, Washington, DC 20009 USA. Tel: 800-966-2481 or 202-462-6910, ext. 215; Fax: 202-328-0566; Email: [meetinginfo@kosmos.agu.org](mailto:meetinginfo@kosmos.agu.org) (Subject: 1998 Fall Meeting)

**Sept. 12-15, 1999: Third International Workshop on Orogenic Lherzolites and Mantle Processes**, Pavia, Italy. [http://www\\_crystal.unipv.it](http://www_crystal.unipv.it)

**Oct. 25-28, 1999: GSA Annual Meeting**, Denver, CO USA, Contact: Becky Martin, GSA Meetings Department, Box 9140 Boulder, CO 80301-9140 USA. Tel: +1-303-447-2020, ext. 164; Fax: +1-303-447-1133.

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