Preprint

Newsletter

of the

International Association of Geochemistry and Cosmochemistry

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Gunter Faure, Newsletter Editor

The International Association of Geochemistry and Cosmochemistry is a Nonprofit Organization



Last Call:

Please renew your membership in the IAGC today

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News from the Association

Message from the Editor

The collection of dues for membership in the IAGC has been underway since late December and is rapidly nearing completion. The closing date for the payment of dues is May 1, 2002. Anyone who has not paid by that date will be assumed to have resigned from the Association and will not receive the next Newsletter scheduled for October.

I take this opportunity to acknowledge the help of Attila Demeny of Hungary who has been collecting dues from our members in the Euro countries. We are trying to eliminate the fees that banks charge for issuing checks in US dollars or in any other foreign currency. Most of our members have found ways to pay in the currency of their country or by sending paper currency through the mail.

This fall, the collection of dues for 2003 will start in September in order to avoid the delay in the mailing of invoices for the subscription to APPLIED GEOCHEMISTRY that as occurred this year. I am in contact with Elsevier about the problem with the invoices which were to be mailed in February. All of us are getting anxious, but we are all "in the same boat."

I draw you attention to the next Council Meeting which will take place during the Goldschmidt Conference on August 18 in Davos, Switzerland. Our President (Eric Galmiov) and Vice President (John Ludden) will attend and, by so doing, they will assume responsibility for steering our ship in the future.

I also draw your attention to information about our Working Groups and the meetings they are organizing. Plan to attend these meetings when they occur in your part of the world and participate by making presentations.

Until we meet again in October, I offer you my best wishes and hope that your house will be safe from tigers.

Gunter Faure

Renewal of Memberships in 2002

The collection of dues for membership in the IAGC in 2002 is nearing completion as most of our members have already submitted their payment either to Gunter Faure or to Attila Demeny (Euro countries).

The Association has facilitated the payment of dues by accepting different currencies in amounts that are equivalent to $15.00 US. Elsevier Science has already mailed invoices for renewal of subscriptions to APPLIED GEOCHEMISTRY at the special rate reserved for members who have paid their dues to the IAGC.

We will continue to accept late dues payments until May 1, 2002. Members who have not paid their dues on this date will not receive the October issue of the Newsletter and their names will be deleted from the Membership Directory.

There will be no additional reminders. Please act now and avoid having to re-apply for membership later.

Please renew your membership in the IAGC today

News from the Solar System

Mission to Pluto

When the proposed U.S. budget for 2002 excluded funds for a mission to Pluto, hope for such a mission began to fade. Fortunately the Congress responded to the requests of many members of the Planetary Society and of other individuals by adding 30 million dollars to the 2002 budget for the design of a mission to Pluto and the Kuiper belt. This action does not yet assure that the spacecraft will actually be built and launched before 2006 when the launch window closes, but it is a necessary first step toward achievement of this goal. Thus encouraged, NASA has selected a proposal entitled: "New Horizons: Shedding Light on New Worlds" submitted by a team led by Dr. S.A. Stern of the Southwest Research Institute in Boulder, Colorado. If all goes well, the spacecraft will be launched on time in 2006 and will then encounter Pluto by 2020. So, stay tuned; there may be more news.

A Primer on Pluto

Pluto is the smallest planet in the solar system and was discovered in 1930 by Clyde W. Tombaugh at the Lowell Observatory in Arizona. It was named by Venetia Burney (who was 11 years old at the time) in recognition of the fact that the surface of this planet is cold and dark like the underworld of Roman mythology.

Some of the cold facts about Pluto and its orbital characteristics are:

Average distance from the Sun: 39.53 AU
where 1 AU = 149.6×10^6 km

Period of revolution	: 247.7 years
Period of rotation	: 6.39 days
Orbital eccentricity	: 0.248
Diameter	: 2300 km
Density	: 2.03 g/cm^3
Mean surface temperature	: 37 Kelvins
Surface material	: Methane ice (?)

Successful Odyssey

The spacecraft Odyssey reached Mars on October 24, 2001, and went into orbit around it. By doing so, Mars Odyssey succeeded where its predecessors Mars Climate Orbiter and Mars Polar Lander launched in 1998 had failed. In addition, Mars Observer which was launched in 1992 also failed to go into orbit. Even Mars Global Surveyor had a close call when one of its solar panels was damaged during aerobraking after orbital insertion. Fortunately, this spacecraft survived the ordeal and is still operating reliably.

The Odyssey spacecraft carries three scientific instruments. A thermal-infrared imager will measure temperature differences of the Martian surface and detect the presence or absence of certain minerals by the spectrum of the observed infra-red radiation. The gamma-ray spectrometer is capable of detecting 20 chemical elements in the rocks and soil on the surface of Mars. The elements include hydrogen whose presence implies the presence of water or ice within one meter of the surface. A radiation detector recorded radiation levels during the trip to Mars and will monitor radiation in the space around Mars to assess the potential danger to astronauts.

After going into orbit around Mars in October of last year, the orbit of Odyssey has been adjusted by aerobraking in preparation for mapping. This phase of the project was to have ended in January of 2002. Subsequently, Odyssey's Mission will last more than one Martian year which is 687 Earth days or 1.88 Earth years.

Betts, B., 2001. Mars Odyssey enters Mars orbit. Planetary Report, 21(6):18-19.

Annual Meeting of the Meteorical Society, July 22-26, 2002. UCLA, DeNeve Plaza Conference Center, Los Angeles, CA. Contact Paul H. Warren e-mail <pwarren@ucla.edu>, <http//www.lpi.usra.edu/meetings/upcomingmeetings.html>

Fate of the Pioneers

Nearly 30 years ago, on March 2 of 1972, the spacecraft Pioneer 10 was launched from Cape Canaveral and put on a trajectory towards Jupiter. It arrived there on December 4, 1973, and continued outward bound after sending back the first close-up pictures of the planet. Pioneer 10 passed the orbit of Pluto in June of 1983 and entered uncharted regions of space. Pioneer 11 headed for Saturn and, after a successful flyby, also left the Solar System. On October 1, 1990, when it was about 30 Astronomical Units (1 AU = 149.6 x 10^6 km) from the Sun, a electrical component of Pioneer 11 failed thereby ending its ability to send messages to Earth.

The mission of Pioneer 10 continued until March 31, 1997 when it had reached a distance of 67 AU from the Sun. Although Pioneer 10 is no longer supported by a funded project, it has continued to emit a radio signal which can be detected by the Deep Space Network and by the Radiotelescope at Arecibo in Puerto Rico. At the present time, Pioneer 10 is 79 AU from the Sun and is traveling with a velocity of 12.24 km/s toward the red star Aldebaran in the constellation Taurus.

The Doppler shift of the radio signal emitted by Pioneer 10 has revealed an unexplained acceleration directed **towards** the Sun. Therefore, a systematic effort is currently underway to determine whether Newton's Laws of Gravitation apply in interstellar space as they do on Earth. The best available data indicate that the anomalous acceleration of Pioneer 10 is $8.74 \pm 1.25 \times 10^{-8}$ cm/s^2.

A possible explanation for the strange motion of Pioneer 10 is that, at large distances, the gravitational force decreases as the reciprocal rather than as the square of the distance. This hypothesis was proposed by Mordekai Milgrom and is appropriately known as MOND (Modified Newtonian Dynamics).

Andersen, J.D., P.A. Laing, E.L. Lau, M.M. Nieto, and S.G. Turyshev, 2001. The strange acceleration of Pioneer 10 and 11. The Planet. Report, 21(6):13-17.

Working Groups of the IAGC

The International Association of Geochemistry is the only scientific society that supports Working Groups which regularly organize international symposia in different places of the world on topics of geochemistry and cosmochemistry. These meetings bring together the active researchers in each of the several subject areas and thereby help them to interact with their colleagues. In addition, these meetings regularly attract hundreds of persons who benefit from the oral and poster presentations, but who are not required to join the IAGC. In this way, the IAGC stimulates research in geochemistry and cosmochemistry, and at the same time, facilitates the dispersal of knowledge gained by the researchers.

We strongly encourage our members to familiarize themselves with our Working Groups and with the subjects they represent. Please feel free to contact the chairpersons and ask for information concerning future meetings or to make suggestions about matters that interest you. Our Working Groups are advancing the state of the art in their subject areas. All of us can participate and be inspired.

Symposia in 2002

Working Group on the Geochemistry of the Earth's Surface.

The sixth international symposium (GES-6) will take place at the East-West Center, Honolulu, Hawaii, on May 20 to 24, 2002. Details are available online at <http://imina.soest.hawaii.edu/oceanography/ges-6/>. This conference will be one of the major events on the geochemical calendar in 2002. Contact Fred MacKenzie at <fredm@soest.hawaii.edu> with questions.

INTERNATIONAL INGERSON LECTURE

GES-6, Honolulu, Hawaii

May 20-24, 2002

GEOCHEMICAL EVOLUTION OF CLOSED BASIN WATERS: A REVIEW

JONES, Blair F., Water Resources Div., U.S. Geological Survey, Reston, VA 20192
bfjones@usgs.gov

In the twenty-plus years since the publication of comprehensive, semi-quantitative descriptions of closed basin brine evolution, efforts have focused on the development of computer simulation models, rather than actually reaction mechanisms. This focus is appropriate for the major solutes (chloride and sulfate salts), which are exclusively or predominantly affected by solubility considerations accompanying evaporative concentration. However, complex carbonates and silicates, which exert major influence particularly on the alkaline earth cations (Ca, Mg, Sr), complicate the situation. The general association of the major solute anions with principal lithology–carbonate species with silicate (especially pyroclastic) as well as carbonate rocks, and sulfate with sulfide weathering or ancient evaporates–has now been further documented for a number of areas, particularly in the Great Basin. The simplest early quantitative predictor of major solute evolution is still the "chemical divide" of Eugster and Hardie (1978), based on the mass-action equivalence of cation and anion required for the direct precipitation of calcite and gypsum. The principle is easily applied through the use of the "Spencer triangle" (Jones & Bodine, 1987, Spencer, 2000); the plot position of a water composition in terms of Ca, SO_4, and CO_3 species determines the ultimate major cation-anion dominance in the resulting brine. The most important deviations from simple concentration trends caused by heterogeneous carbonate (e.g., dolomite) and silicate (e.g., interstratified smectite) reactions primarily affect Mg, Sr, and K. Information on the kinetics of formation of these phases and their effect on general solute evolution is only slowly emerging. The understanding of redox and microbial phenomena, principally affecting metals and sulfate, is also largely qualitative at present. Of course, solute fractionation in closed basin water is strongly influenced by hydrologic properties and processes. In surface waters the most important factors are inflow, mixing, evaporation and temperature. In ground-water systems aquifer heterogeneity is critical as it controls fluid velocity, flow paths, hydrodynamic dispersion, and thus, contact or residence time.

Eugster, H.P. and Hardie, L.A., 1978, Saline lakes. In A. Lerman (ed), *Lakes: Chemistry, Geology, Physics.* New York, Springer-Verlag, pp. 237-293.
Jones, B.F., and Bodine, M.W.,jr., 1987, Normative salt characterization of natural waters. In P. Fritz & S. K. Frape (eds.), *Saline water and gases in crystalline rocks.* Geological Association of Canada Special Paper 33, pp. 5-18.
Spencer, R.J., 2000, Sulfate minerals in evaporite deposits. In C.N. Alpers, J.L. Jambor, & D.K. Nordstrom (eds.), *Sulfate Minerals: Crystallography, Geochemistry, and Environmental Significance.* Washington, D.C., Mineralogical Society of America; Geochemical Society; Reviews in Mineralogy & Geochemistry, v. 40, pp. 173-189.

International Ingerson Lecture

The GES-6 conference in Honolulu, Hawaii, will feature the International Ingerson Lecture of the IAGC. The speaker is Dr. Blair Jones, outstanding geochemist and Chair of the Working Group on the Geochemistry of the Earth's Surface.

Working Group on Meteoritics and Cosmochemistry.

The next event will be a session on Stars, Disks, and Planetary Growth to be organized as part of the Goldschmidt Meeting from August 18 to 23, 2002, in Davos, Switzerland. Consult Herbert Palme at <palme@gwp-min.min.uni-koeln.de> for more details including the identity of the keynote speaker at this session.

Working Group on Global Geochemical Baselines.

The third symposium on geochemical mapping of Europe will be convened in 2002 in Orleans, France. A geochemical atlas of Europe will be published in 2004. For more information contact Dr. David Smith, USGS, Denver Federal Center at <dsmith@usgs.gov> or 303-236-1849 (phone) or 303-236-3200 (fax).

Working Group on Geochemistry and Disease.

This group will participate in the 7th International Symposium on Metal Ions in Biology and Medicine, May 5-9, 2002, in St. Petersburg, Russia. Request more information from Dr. Robert Finkelman, USGS, National Center, Reston, VA at <rbf@usgs.gov> or 703-648-6412 (phone) or 703-648-6419 (fax).

Twelfth Annual V. M. Goldschmidt Conference, August 18 to 23, 2002. Davos, Switzerland. Contact: Gold2002@compublic.co.uk and at http://www.goldschmidt-conference.com/gold2002.

AIG-5 in Australia

Our Working Group on Applied Isotope Geochemistry which held its fourth meeting in Monterey, California, last year has scheduled its next meeting (AIG-5) for May 26 to 30, 2003, on Heron Island on the Great Barrier Reef of Australia.

The organizers Blair Hostetler, Andrew Herczeg, Judith Batts, and Barry Batts plan to keep the registration and accommodation costs to less than about $750 US. Blair Hostetler is organizing a field trip (post-meeting) to some interesting parts of Australia. The cost of the trip is not included in the registration and accommodation fee.

A home page is being prepared and will be announced later. In the meantime, Barry Batts can be reached at <bbatts@alchemist.chem.mq.edu.au>. Please spread the word and plan to make the trip down under.

39th Annual Meeting of the Clay Mineral Society, June 8-13, 2002. University of Boulder, Boulder, CO. Contact: Kathryn Nagy, 303-492-6137, kathryn.nagy @colorado.edu. The meeting includes a workshop: Teaching Clay Science on June 8 and a Field Trip: Clays and the Front Range on June 13.

Join the IAGC

If you are not yet a Member or if your Membership has lapsed, contact our Secretary Mel Gascoyne at <gascoyne @granite.mb.ca>. Annual dues are only $15.00 US. For that you get two Newsletters per year and a low-cost subscription to APPLIED GEOCHEMISTRY at $51.50 for 2002.

American Geophysical Union, December 6-10, 2001, San Francisco, California. Contact AGU, 2000 Florida Ave., N.W., Washington, DC 20009. Phone: 202-462-6900.

Medical Geochemistry of Arsenic

Thousands of people in Guizhou Province of China display the effects of arsenic poisoning with symptoms that range widely from freckled skin to squamous cell carcinoma. The source of the arsenic is the coal which is being burned in order to dry corn, chili peppers, and other crops. Many houses in which coal ovens are in use have no chimneys causing the arsenic to accumulate indoors.

The arsenic concentration of the coal in Guizhou Province ranges up to 35,000 ppm compared to only about 22 ppm in coal of the USA. As a result of the poor ventilation, the arsenic concentration of chili peppers increases from about 1.0 ppm in fresh peppers to more than 500 ppm after drying over coal-burning stoves.

The regional distribution of arsenic in the coal deposits is being mapped by geologists and geochemists of the U.S. Geological Survey and by their Chinese colleagues. The objective of the joint project is not only to warn people but also to find solutions. To this end Robert B. Finkelman (Chair of our Working Group on the Geochemistry of Disease) and Harvey E. Belkin are working with Dan Kroll of the Hach Company who has developed a field test for arsenic in coal.

The test kits are being sent to Bangladesh where the drinking water used by millions of people contains high concentrations of arsenic. If these test kits are found to be effective, Finkelman and Belkin hope to raise enough money to distribute the test kits to the people of Guizhou Province free of charge. The availability of accurate geochemical maps combined with the test kits will enable the people to avoid mining and burning arsenic-rich coal and will reduce the severity of arsenic poisoning.

Simpson, S., 2002. Coal control: tackling the health dangers of China's "dirty" coal. Scientific American, 161:20-21.

Coming Events

April 29 - May 1, 2002. **Third International Conference on Applications of Stable Isotope Techniques to Ecological Studies**, Flagstaff, Arizona, USA. Contact: Dr. Joseph Shannon, Northern Arizona University, Dept. of Biological Sciences, P.O. Box 3040, Beaver St., Building 21, Flagstaff, AZ. Phone: +1-928-523-1740; Fax: +1-928-523-7500, e-mail: <joseph.shannon @nau.edu>.

May 8, 2002. **100th Anniversary of the Eruption of Mt. Pelee**, International Association of Volcanology and Chemistry of the Earth's Interior (IAVCEI) workshop, Martinique. <http://www.iavcei.org>.

May 28 - June 1, 2002. **AGU Spring Meeting**, Washington, DC, USA. <www.agu.org/ meetings> or e-mail: <meetinginfo@agu.org>.

June 8-13, 2002. **39th Annual Meeting of the Clay Mineral Society**. University of Boulder, CO. Contact: Dr. Kathryn Nagy, Tel. 303-492-6137, e-mail: <kathryn.nagy@colorado.edu>.

July 14-17, 2002. **Fifth International Conference on arsenic exposure and health effects**, San Diego, California, USA. Society for Environmental Geochemistry and Health. <http://www.cudenver.edu/as2000/>.

July 21-15, 2002. **9th International Platinum Symposium**, Holiday Inn - Grand Montana, Billings, MT, USA. By the IGCP 427/SEG/ SGA. Contact: Roger Cooper, Dept. of Geology, Lamar University, P.O. Box 10031, Beaumont, TX 77710, USA; Phone: +1-409-880-8239; e-mail: <cooperrw@hal.lamar.edu>, <http://www.platinumsymposium.org>.

July 22-26, 2002. **The Earth System and Metallogenesis - 11th Quadrennial IAGOD Symposium and GEOCONGRESS 2002**, Windhoek, Namibia. Theme: Sedimentary and magmatic responses to compressional and extensional tectonics and the associated ore-forming processes. Hosted by: The Geological Society of Namibia, the Geological Society of Namibia, the Geological Society of South Africa, The Geological Society. Contact: IAGOD/ Geocongress 2002 Conference Secretariat, P.O. Box 9870, Windhoek, Namibia; Phone: +264-61-251014; Fax: + 264-61-272032; (Alice Kaukuetu-Hue) e-mail: <geoconference2002@conferencelink.com.na>, <www.geoconference 2002.com>.

July 22-26, 2002. **65th Annual Meeting of the Meteoritical Society**, UCLA DeNeve Plaza Conference Center, Los Angeles, CA, USA, the Meteoritical Society, Lunar and Planetary Institute. Contact: Paul H. Warren, Institute of Geophysics, UCLA, Los Angeles, CA 90095-1567, USA; Phone: +1-3108253202; e-mail: <pwarren@ucla.edu>; <http//www.lpi.usra.edu/meetings/upcomingmeetings.html/>.

Aug. 18-23 2002. **Twelfth Annual V.M. Goldschmidt Conference, incorporating ICOG X**, Davos, Switzerland. Contact: Cambridge Publications, P.O. Box 27, Cambridge CB1 8TR, U.K.; e-mail: <Gold2002@campublic.co.uk>. <http://www.goldschmidt-conference. com/gold2002/>.

Aug. 26 - Sept. 3, 2002. **Fourth International Workshop on Orogenic Lherzolites and Mantle Processes**, Samani, Hokkaido, Japan. Details on the web at: <http://earth.s.kanazawa-u.ac.jp/LherzoliteWorkshop2002/>. Deadline for registration and abstract submission on April 30, 2002.

Sept. 1-6, 2002. **Mineralogy for the new millennium (IMA 2002), 18th General Meeting of the International Mineralogical Association**, Edinburgh, United Kingdom. Contact Mr. K. Murphy, Executive Secretary, Mineralogical Society of Great Britain and Ireland, 41 Queen's Gate, London SW7 5HR, United Kingdom: Phone: +44-171-584-7516; e-mail: <IMA@minersoc.demon.co.uk>; <http://www.minersoc.org/IMA2002>.

Sept. 2-7, 2002. **Holoene environmental catastrophes and recovery**, Brunel University, West London, UK. Co-sponsored by Brunel University, INQUA and PAGES. Contact: Prof. Suzanne A.G. Leroy, Department of Geography and Earth Sciences, Brunel University, Uxbridge, Middlesex UB8 3PH, (West London), UK; Phone +44-1895-20-31-78; Fax: +44-1895-20-3217; Phone secr: +44-1895-20-3215; e-mail: <suzanne.leroy@brunel.ac.uk>. <http://www.brunel.ac.uk/depts /geo/catastrophes>.

Sept. 12-14, 2002. **The Moon and Beyond**, Taos, New Mexico. Contact: Dr. D.J. Lawrence, Space and Atmospheric Sciences, NIS-1, MSD 466, Los Alamos, NM 87545. Phone: 505-667-0945, Fax: 505-665-7395, e-mail: <djlawrence@lanl.gov>.

Sept. 16-20, 2002. **Uranium Mining and Hydrogeology III - International Mine Water Association. Symposium - Mine Water and The Environment**, Freiberg, Germany. Contact: Prof. Dr. B. Merkel, Dr. Christina Wolkersdorfer, Lehrstuhl f,r Hydrogeologie; Gustav-Zeuner-Str. 12; D-09596 Freiberg/Sachsen, Germany; Phone: +49-3731-39-3309; Fax: +49-3731-39-2720; <UMH@IMWA.de>, <http://www.IMWA.de>.

Oct. 27-30, 2002. **Geological Society of America Annual Meeting, Denver, Colorado, USA**. Contact: GSA Meetings, Box 9140, Boulder, CO 80301-9140, USA. Tel: +1-303-447-2020, ext. 164; Fax: +1-303-447-1133. <http://www.geosociety.org/meetings/index.htm>.

Dec. 6-10, 2002. **AGU Fall Meeting**, San Francisco, California, USA. <www.agu.org>.

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Dec. 18-20, 2002. **Hydrology and Watershed Management**. Centre for Water Resources, Jawaharlal Nehru Technological University, Hyderabad 28, India. Contact: Dr. U. Aswathanarayana, e-mail: <anarayana01 @sify.com>, website: <www.jntu.ac.in>.

May 20-23, 2003. **GERM 4**, Lyon France. Contact: Janne Blichert-Toft, Laboratoire de Sciences de la Terre (CNRS UMR 5570), Ecole Normale Supérieure de Lyon, 46, Allée d'Italie, 69364 Lyon Cedex 7, France; Phone: +33-(0)472-72-84-88; Fax: +33-(0)472-72-86-77; <jblicher@ enslyon.fr>.

May 26-30, 2003. **Fifth International Conference of Applied Isotope Geochemistry (AIG-5)**, Working Group of the IAGC, Heron Island, Australia. Contact: Dr. Barry Batts, e-mail: <bbatts@alchemist.chem.mq.edu.au>.

Sept. 7-11, 2003. **6th International Symposium on Environmental Geochemistry (ISGE)**, Edinburgh, UK. Dr. John G. Farmer, Department of Chemistry, University of Edinburgh, West Mains Road, Edinburgh EH9 3JJ, UK; e-mail: <J.G.Farmer@ed.ac.uk>.

Nov. 2-5, 2003. **Annual Meeting GSA**, Seattle, Washington. <http://www.geosociety.org/ meetings/index.htm>.

Dec. 8-12, 2003. **AGU Fall Meeting**, San Francisco, California, USA. <www.agu.org>.

Aug. 20-28, 2004. 32nd International Geological Congress, Florence, Italy. Web address: <http://www.32igc.org/>.

Twelfth Annual V. M. Goldschmidt Conference, August 18 to 23, 2002. Davos, Switzerland. Contact: Gold2002@compublic.co.uk and at http://www.goldschmidt-conference.com/gold 2002.

New Books in Print

Alvarez, W., 1997. T-Rex and the crater of doom. 236 p. $29.95. Princeton Un. Press, Princeton, N.J.

Barbarin, B. and W.E. Stephens, eds., 2001. The fourth Hutton Symposium on the origin of granites and related rocks. Geol. Soc. Amer. Special Papers 350, $85.00, ($68.00 for Members).

*Bethke, P.M. and R.L. Hay, eds., 2000. Ancient Lake Creede: its volcano-tectonic setting, history of sedimentation and relation to mineralization in the Creede Mining district. Geol. Soc. Amer., Special Papers 346, 340 p. $55.00 ($44.00 for Members).

Deffeyes, K.S., 2001. Hubbert's Peak: the impending World oil-shortage. Princeton Un. Press, 208 p., $24.95.

Dressler, B.O. and V.L. Sharpton, eds., 1999. Large meteorite impacts and planetary evolution II. Geol. Soc. Amer., Special Papers 339, 300 p., $112.00 ($89.60 for Members).

Ehlen, J. and R.S. Harmon*, eds., 2001. The environmental legacy of military operations. Geol. Soc. Amer., Reviews in Engineering Geology, 14. ISBN 0-8137-41149-9.

Ferris, T., 2001. Life beyond Earth. Simon and Schuster, 222 p., $40.00.

*Koeberl, C. and K.G. MacLeod, eds., 2002. Catastrophic events and mass extinctions: impacts and beyond. Geol. Soc. Amer., Special Papers, 356 (in preparation).

Leverington, D., 2000. New cosmic horizons: space astronomy from V2 to the Hubble Space Telescope. Cambridge Un. Press, $85.00.

Levy, D.H., 2000. Shoemaker: the man who made an impact, 320 p., $27.97, Princeton University Press, Princeton, NJ.

Li, Y-H., 2000. A compendium of geochemistry: from solar nebula to the human brain. 488 p. $70.00. Princeton University Press, Princeton, N.J.

Poag, C.W., 1999. Chesapeake invader: discovering America's giant meteorite crater, 168 p., $24.95. Princeton University Press, Princeton N.J.

Powell, J.L., 2001. Mysteries of Terra Firma: Exploring the age and evolution of the world. Free Press, 272 p., $25.00.

Ryder, G., D. Fastovsky, and S. Gartner, eds., 1996. Cretaceous-Tertiary event and other catastrophes in Earth history. Geol. Soc. Amer., Special Papers 309, CD only. $28.00 ($22.40 for Members).

*Siegel, F.R., 2001. Environmental geochemistry of potentially toxic metals. Springer Verlag, Berlin, 218 p., $49.95.

Snyder, G.A., C.R. Neal, and W.G. Ernst, eds., 1999. Planetary petrology and geochemistry. Geol. Soc. Amer., International Book Series, 277 p., $50.00 ($40.00 for Members).

Underwood, J.R., Jr., and P.L. Guth, 1998. Military geology in war and peace. Geol. Amer., Reviews in Engineering Geology, 13, 245 p. $50.00 ($40.00 for Members).

Villiers, M. de, 2000. Water: the fate of our most precious resource. Mariner Books, 352 p. $15.00.

Wordwatch Institute, 2001. Vital signs 2001: the trends that are shaping our future. Norton, 192 p., $13.95.

*Member of the IAGC



SIXTH INTERNATIONAL SYMPOSIUM ON ENVIRONMENTAL GEOCHEMISTRY

ISEG 2003, September 7-11, 2003 Edinburgh, Scotland

Location:
Edinburgh, UK
Dates:
7-11 September, 2003
Symposium Chairman:
Dr. John Farmer (J.G.Farmer@ed.ac.uk)
Department of Chemistry
University of Edinburgh
West Mains Road, Edinburgh, EH9 3JJ, UK
Organisers:
Janet Beard (janet@in-conference.org.uk)
In Conference Ltd
10b Broughton Street Lane
Edinburgh EH1 3LY, UK
Tel: +44(0)131-556-9245
Fax: +44(0)131-556-9638
Website:
<www.iseg2003.com>

Century-Old Diamond Hoax Re-examined

by Henry Faul[1]

Pioneer of geochronometry, the history of the Earth, and of many other topics.

Reprint permission courtesy of The American Geological Institute

In the fall of 1871, as Asbury Harpending tells the story, 2 grizzled prospectors appeared at the Bank of California in San Francisco, carrying a little leather pouch and asking to have it put in the vault for safekeeping. The teller wasn't impressed, but the men insisted. After a lot of roundabout talk they let him peek into the bag and by that time they had dropped enough hints for him to have no trouble noticing that the bag was full of raw diamonds. That made a difference! The prospectors gave their names as Philip Arnold and John B. Slack, he gave them a receipt, and they were gone.

After some weeks, the prospectors let the bank find them. Where did they get the diamonds? They had a mine. Where was the mine? They wouldn't say. Would they sell a few shares in the mine? Well... perhaps. Would they let the mine be appraised by a geologist? Not until their rights were protected. That's how it went, over and over again, but the diamonds were there sure enough.

The money men were not exactly ignorant of that game. George Dodge and William Lent were partners and had made their pile selling gold mines on the Comstock Lode. George Roberts had also promoted several big mine deals, and Harpending, a Southern Gentleman with an unforgettable name, was the boldest sharper of them all. He was from Hopkinsville, Ky., and during the Civil War he had masterminded the outfitting of a Confederate privateer in San Francisco harbor, right under the noses of the authorities. He was caught and got 10 years for treason but was released under a general amnesty. Then he beat it into the hills to try his hand at mining. He did it well, returned to San Francisco, and became prominent in the investment business. It may be equally fair to say that he always remained a pirate.

The prospectors were also from western Kentucky and Harpending knew them well. They had worked for him from time to time and so it wasn't long before the whole company took the train to New York to hire a lawyer, consummate an agreement, and to launch the stock promotion. The bag of diamonds went with them.

The lawyers thoughtfully arranged a public appraisal of the diamonds by Charles L. Tiffany in the presence of distinguished witnesses. Tiffany was the biggest name in jewelry, but his success was based on his talent for business and his perception of the taste of his public. Technical details he left to others. When he was ceremoniously handed the little bag of diamonds, he acted his part with conviction and correctly declared the stones genuine even though chances are that it was the first time in his life he had held raw diamonds in his hand. Wisely, he postponed evaluation until he had conferred with his technical staff, but 2 days later he issued a statement appraising the lot at $150,000.

All the while the location of the diamond field was a secret presumably known only to Arnold and Slack, and they–properly acting the simple, greedy prospectors awed by all the attention–appeared afraid to tell. How could they be sure, they kept asking, that one of these gentlemen wouldn't beat them out of their discovery?

Finally they agreed to form a company with a capital of $10 million, one quarter of the stock to go to Arnold, one quarter jointly to Dodge and Lent, and one sixth each to Harpending, Ralston, and Roberts. Arnold received $100,000 in cash right there and a

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[1]Geotimes, 17(10):23-26, 1972

promise of $150,000 more after he had taken a survey party to his mine next spring.

The top consulting geologist in California at the time was Henry Janin, and he was picked to make the appraisal. Janin also had never seen a raw diamond, but that didn't disturb anybody. He had made mine appraisals for Lent and Harpending and that was good enough. His contract showed great imagination: a cash fee of $2,500, the whole job to require less than a month, all expenses paid, plus an option to buy 1,000 shares of the company at $10 a share.

The first exploring expedition assembled in Rawlins, Wyo., a town then only 5 years old, on the brand-new Union Pacific Railroad. They rented a pack train and started southward. Harpending was in command, Arnold the guide, and Janin the honored guest. Dodge and Lent represented the investors, Slack was there to help Arnold, and a young Englishman named Alfred Rubery went along for no obvious reason. Who was that Englishman?

About 10 years earlier, Rubery had come to America in quest of adventure and found it in San Francisco where he met Harpending, joined him in the privateering venture, and got 10 years just like his newfound buddy. Through the influence of his uncle, who was a Member of Parliament, he was spirited back to Birmingham and the family hardware business. 10 years later he had two or three bankruptcies to his credit and decided to take another trip to America 'for his health'. What healthier occupation could there be than tagging along with Harpending, playing the part of a disinterested observer?

The party headed into the northwest corner of Colorado Territory, one of the most desolate parts of the West. After about a week, Arnold rode ahead to reconnoiter and on that very afternoon they reached the diamondiferous area. It was a mesa capped by a hard, coarse, ferruginous sandstone, on the north slope of a wooded peak still topped with snow. The date was June 16, 1872. They had gone less than 100 miles from Rawlins as the crow flies.

Diamonds, sapphires, and rubies were lying all over the place. They were on top of the sandstone, in cracks, and on anthills.

Now Janin got busy earning his money as Arnold led him from anthill to anthill. The geologic incongruities seem to have been lost on Janin. Most of the 'rubies' were actually garnets, but he did not notice. After the first few days of picking up stones and staking out claims he became worried about the effect this stupendous mine would have on the world diamond market and set out to determine the limits of the diamondiferous area. He wanted to make sure that all the land would be claimed so that the company could establish a monopoly and control production.

After about a week the landscape was bristling with claim stakes and the party's provisions were running low. Janin had not finished but Harpending decided to go back to Rawlins. He ordered Slack and Rubery to stay behind to guard the prospect.

Why was it necessary to guard the place now? And how could 2 lightly armed, inexperienced guards, low on provisions, have accomplished such a task? It seems that they stayed only a day or two and then headed for the railroad.

The hubbub that followed made all other Western mine flurries look like kid stuff. Janin gave a glowing report and debated the effect on the world market. That was something the money managers understood. There was actually a minor panic in South Africa. The San Francisco & New York Mining & Commercial Co. was organized and an additional payment of several hundred thousand dollars was made to Arnold but no stock was sold to the public. All through the summer and early fall the whole West was talking diamonds and dozens of prospecting parties searched the wilds for the new Golconda. They were skillfully misdirected by planted rumors giving clues to the supposed location. In an interview that Arnold gave to the Laramie Sentinel, he placed the prospect in Arizona.

Amidst all the hocus-pocus, another expedition was organized, consisting of 16 men with Roberts in

charge and Rubery as guide. They started from Green River, Utah, and spent a month in the wilds before they reached the diamond mesa. They were still there when things began to go wrong.

First the Virginia City (Nev.) *Territorial Enterprise* published an article on Aug. 3, 1872, stating flatly that there were no diamonds in Arizona or New Mexico and hinting that the diamond scheme was a fraud. The conclusion seems to have been based more on general principles than on hard fact, but in 1872 it was a safe bet that any Western mining promotion was a humbug. Whatever the merit of the story, it did not escape the attention of the *New York Times* or *The Times* of London.

On Aug. 11, the *New York Times* published a curt denunciation of the diamond promotion and indicated that further news of it would not be fit to print. *The Times* of London took a different view of its responsibilities and published a series of articles by Marmaduke Sampson, the city editor. One of Sampson's friends was Baron Grant, a specialist in dubious promotions on the London stock exchange and a former partner–but no great admirer–of Asbury Harpending.

On Aug. 27, 28, and 29 Sampson ran brief stories of the diamond discovery and on Aug. 30 he dropped a bomb in the form of a letter from Pittar, Leverson & Co., diamond brokers, relating that about a year before a prominent London dealer had talked of American bumpkins who came to his establishment with a very large bankroll, asked for raw diamonds and rubies, and bought most of what he had without regard for size or quality. The letter concluded: 'That mysterious purchase has never been cleared up to this day but now we think we have a clue to it.'

The news reached San Francisco as fast as telegraph keys could tap it out, but *The Times* did not carry that much weight in the West and the effect on the diamond hysteria was surprisingly small. The company did not appear shaken at least for a month or so.

To be completed in the October issue of 2002.

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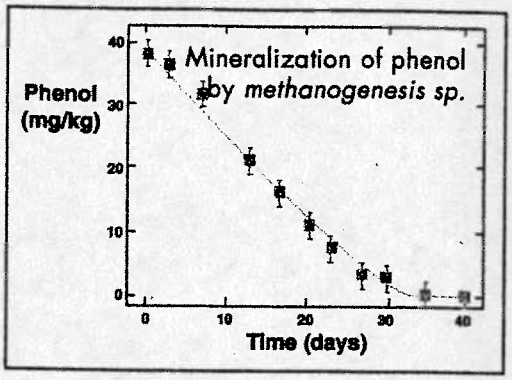
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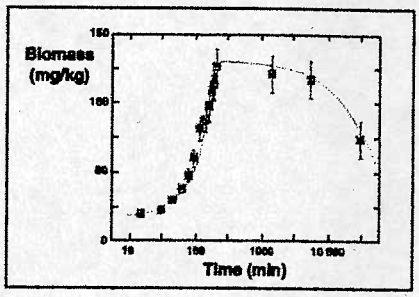
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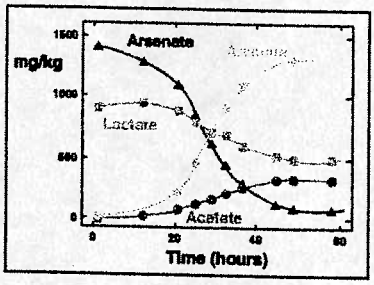
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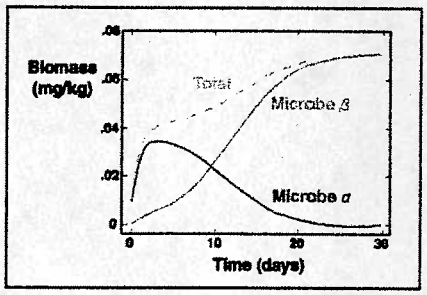
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