

149

Newsletter

of the

International Association of Geochemistry and Cosmochemistry

Number 33, August 2000
Gunter Faure, Newsletter Editor

The International Association of Geochemistry and
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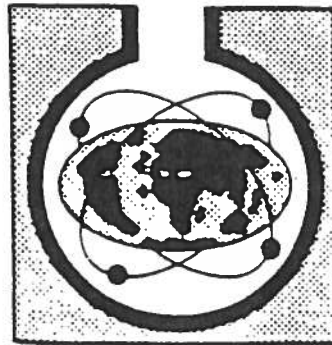


Table of Contents

News from the Association

A Message from the President	1
The Membership of the IAGC	2
From the Archives of the IAGC	3
Lunar and Planetary Science Institute	4
Thermal History of Meteorites	5
The Trouble with Pluto	6
An Environmental Fable	6
International Ingerson Lecture	6
Discovery of Diamonds in Canada	7
Coming Events	8
Introduction to Professor Jerome Nriagu	9
Third Theme Session at the Annual Meeting of the GSA Sponsored by the IAGC	9

Activities of the Working Groups

Meteorites and Cosmochemistry	11
Water-Rock Interaction	11
Applied Isotope Geochemistry	12
Geochemistry of the Earth's Surface	12
Thermodynamics of Natural Processes	12
Geochemical Training in Developing Countries	13
Geochemistry of Health and Disease	13
Global Geochemical Baselines	13

Other Activities Supported by IAGC

The 31 st International Geological Congress	13
Symposium on Hydrogeology and the Environment	14
Short Course: ICP-AES, Principles and Applications in Environmental Geoscience and Oil Exploration	14
Seventh International Kimberlite Conference (1998)	14

New Books in Print

Books of General Interest	15
Geochemical Atlas of Lithuania	15
Minerals Yearbook of Poland	15

Applied Geochemistry

A Story of Unqualified Success	16
Applied Geochemistry Editor's Report	16
Growth of Applied Geochemistry	17

Officers of the IAGC	18
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News from the Association

A Message from the President

The Association has had a very successful year and can look forward to a bright future in terms of the continuing growth of our Membership, the scientific symposia being organized by our Working Groups, and the increasing page budget and frequency of publication of APPLIED GEOCHEMISTRY. I am especially pleased to welcome 44 geochemists who joined us in 1999 thereby raising our total membership to more than 700. In addition, Sigurdur R. Gislason of the Working Group on the Geochemistry of the Earth's Surface organized the fifth international symposium in Reykjavik, Iceland, and published the Proceedings in a most attractive volume edited by Halldór Armannsson. I am also pleased to record the symposia that were organized by other Working Groups:

Genesis of PGE-bearing sulfide deposits (Strasbourg, Thermodynamics of Natural Processes);

Thermal history of meteorites (Johannesburg, Meteoritics and Cosmochemistry);

Third symposium on applied isotope geochemistry (Orleans, Applied Isotope Geochemistry)

We are all in debt to Jochen Hoefs (Göttingen) and the members of the Nominations Committee which he chaired (Norbert Clauer, Strasbourg; Mariusz O. Jedrysek, Wroclaw; Zheng Yong-fei, Heifei) for nominating candidates for Vice President and Councillor of the IAGC:

Dr. John Ludden, Vice President (France)

Dr. Jan Kramers, Councillor (Switzerland)

Dr. Attila Demeny, Councillor (Hungary)

Dr. Russell Harmon, Councillor (USA)

I take this opportunity to thank the members of the Nominations Committee for their excellent work and to welcome the nominees to the IAGC. These nominations assure that the chain of succession will be unbroken.

In conclusion, let me say that the Council of the IAGC at its Meeting on October 25 in Denver considered several important issues that affect how the Association will function in the future and how we can better serve our Members. The results of these deliberations will be included in Newsletter 34 to be issued in October of 2000. Among other things, we decided to issue a new Member Directory that will include e-mail addresses.

Please help us to assemble this information by sending an e-mail stating your name and address to Gunter Faure at the e-mail address: faure.1@osu.edu

As always, I am looking for feedback from our Members and invite you all to send me your comments and suggestions to the e-mail address above.

Gunter Faure

The Membership of the IAGC

The statutes of the Association originally provided four kinds of membership:

1. National Members
2. Individual Members
3. Sustaining Members
4. Honorary Fellows

The number of National Members has been declining since the Association was founded in 1967. Therefore, the Council at its Meeting in October of 1999 in Denver decided to ask the Representatives of the remaining National Members to disband. This vote is currently in progress and the results will be announced at the next Council Meeting on September 3 in Oxford, England.

In contrast to the National Members, the number of Individual Members has been rising and now stands at 774. The breakdown by country indicates that 48 countries or provinces are represented. The largest number of members resides in North America (Canada, USA, and Mexico): 404 members or 52%. The European nations are next with 235 members (30%), Asia has 75 members (10%), Australia and New Zealand (34 members, 4.4%), South America (14 members, 1.8%), Africa (10 members, 1.3%), Armenia and Saudi Arabia have one member each. These data make clear that we need to make it easier for geochemists who reside in countries that have currency restrictions to join our Association.

<u>Country</u>	<u>July 2000</u>	<u>July 1999</u>
Armenia	1	2
Argentina	2	3
Australia	26	22
Austria	4	3

Belgium	2	2
Brazil	5	4
Canada	60	58
Canary Islands	1	1
China	9	5
Colombia	6	6
Croatia	1	1
Czech Rep.	1	0
Denmark	3	4
Egypt	2	2
Estonia	2	3
Finland	4	4
France	20	19
Germany	33	29
Greece	2	2
Hungary	5	4
Iceland	3	3
India	12	5
Israel	3	3
Italy	21	16
Japan	25	22
Korea (South)	22	22
Mexico	13	13
Morocco	1	1
Mozambique	1	1
Netherlands	10	11
New Zealand	8	6
Nigeria	1	1
Norway	10	8
Poland	3	3
Portugal	2	2
Russia	4	3
Saudi Arabia	1	2
Slovenia	2	1
South Africa	5	5
Spain	12	9
Sweden	8	9
Switzerland	15	17
Taiwan	5	5
United Kingdom	60	53
USA	331	324
Venezuela	1	2
Viet Nam	2	2
Yugoslavia	4	4
Totals:	774	727

From the Archives of the IAGC

The International Association of Geochemistry and Cosmochemistry came into existence during the first International Symposium of Geochemistry and Cosmochemistry which took place in Paris from May 8 to 11, 1967 (Hitchon, 1986). The officers of the Association confirmed at the meeting included:

E. Ingerson,	President
L.H. Ahrens,	Vice President
K. Sugawara,	Secretary
E.A. Vincent,	Treasurer

The Councillors were: A.G. Cameron (USA), M. Fornaseri (Italy), J.F. Lovering (Australia), J. Roubault (France), R.C. Sinha (India), A.I. Tugarinov (Russia), and K.H. Wedepohl (Germany). The Association requested affiliation with the International Union of Geological Sciences (IUGS) in order to maintain ties with the Earth Science community.

In order to accommodate the wide range of subject matter represented by geochemistry and cosmochemistry, Presidents V.L. Barsukov and M.H. Grünfelder later consolidated a large number of existing special-interest groups and commissions into nine working groups and appointed certain individuals to lead them:

- 1. Geochemical Prospecting;** L.V. Tauson, Institute of Geochemistry, Irkutsk, Russia
- 2. Water-Rock Interaction;** H. Sakai, Ocean Research Institute, Tokyo University, Japan
- 3. Natural Waters-Protection from Pollution;** A.M. Nikanarov, Hydrochemical Institute, Rostov-on-Don, Russia
- 4. Extraterrestrial Geochemistry;** H. Wänke, Max Planck Institute für Chemie, Mainz, Germany
- 5. Weathering, Sedimentary, and Diagenetic Processes;** Y. Tardy, Institut de Geologie, Strasbourg, France
- 6. Thermodynamics of Natural Processes;** I.L. Khodakovsky, Vernadsky Institute of Geochemistry and Analytical Chemistry, Moscow, Russia
- 7. Cooperation in Applied Geochemistry;** J. Goni, Universidade de Sao Paulo, Sao Paulo, Brazil.
- 8. Geochemistry of Health and Disease;** I. Thornton, Department of Geology, Imperial College, London, England
- 9. Applied Isotope Geochemistry (To be appointed).**

Most of these Working Groups are still active and have organized several symposia and special sessions during 1999.

The Statutes of the newly founded Association defined memberships for nations as well as for individuals which was unusual because other international associations have only national members. In 1967, the Council set the annual dues at \$30.00 US for national members and at \$3.00 US for individual members. In 1986, or about 20 years since its

founding; the IAGC had 21 National Members and about 530 Individual Members.

In addition, the Statutes provide that the Council may appoint Honorary Fellows in recognition of their contributions to geochemistry and cosmochemistry. This honor has been bestowed only upon five individuals: A.P. Vinogradov (Russia), T.F.W. Barth (Norway), A.I. Tugarinov (Russia), K. Sugawara (Japan), and E. Ingerson (USA).

The Officers of the Association are nominated by a Committee appointed by the Council and are confirmed by a vote of the Assembly of National Members at a meeting that coincides with the International Geological Congress (IGC). The Association has a President, Vice President, Secretary, Treasurer, and a Past President all of whom serve four-year terms. At the end of the term, the Vice President becomes the next President with approval by the Assembly of Nations. Such a transfer of power will occur at the 31st IGC in August of 2000 in Rio de Janeiro when Vice President Eric Galimov (Russia) will become President and Gunter Faure (USA) will be the next Past President.

The line of descent of Presidents of the IAGC and their terms of office are as follows:

E. Ingerson, USA, 1967-1972

L.H. Ahrens, South Africa, 1972-1977

G. Wetherill, USA, 1977-1980

V.L. Barsukov, Russia, 1980-1984

M.H. Grünenfelder, Switzerland,
1984-1989

H. Wänke, Germany, 1989-1992

H. Sakai, Japan, 1992-1996

G. Faure, USA, 1996-2000

E. Galimov, Russia, 2000-2004

A committee chaired by Jochen Hoefs (Germany) will nominate the next Vice President for approval by the Council of IAGC at its Meeting in Denver, CO, in October of this year. The person so nominated is scheduled to become President in 2004.

References

Hitchon, B., 1986. The International Association of Geochemistry and Cosmochemistry. *Episodes*, 9(3):155-159.

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The LPI and the Universities Space Research Association (USRA) publish the quarterly LUNAR and PLANETARY INFORMATION BULLETIN edited by Brian Anderson. The Bulletin provides information on news from space, publications available from the LPI including educational products, information on new books in print, and a calendar of future events. It is distributed free of charge to scientists and educators. The editorial office can be reached by mail at the address of LPI (above) or by phone: 281-486-2164, by fax: 281-486-2125, and by e-mail: <lpibed@lpi.jsc.nasa.gov>.

THERMAL HISTORY OF METEORITES

by Herbert Palme

At the 62nd annual meeting of the meteoritical society in Johannesburg in July 1999, a special session, sponsored by the International Association of Geochemistry and Cosmochemistry (IAGC), was devoted to the thermal history of meteorites. This somewhat vague expression is used to describe the heating and cooling of the interior of asteroids. The time meteorites spent in space as individuals is remarkably short (millions of years) compared to the time they were inside planetesimals (billions of years) thus recording the heating and cooling of planetary bodies. While there is sufficient accretional energy to heat the interior of the Earth above the liquidus temperature, this is not so with the much smaller km-sized planetesimals where meteorites come from. It is known that melting and differentiation of such bodies occurred very early, shortly after the formation of the solar system. Short-lived radioactive nuclei, such as ²⁶Al are very effective heat sources and the recent discovery of ²⁶Al in eucrites strengthens the case for ²⁶Al heating. It seems now established that heating and cooling took not more than a few million years.

Besides this general picture we know little about how small planets were heated. Why did some suffer complete melting and others barely reached a few hundred degrees in their interior? The size of the planetesimals, the position of meteorites inside the parent planet, the time of accretion, the concentration of short-lived radioactive nuclei all of these may play some role.

Although we have some conceptual ideas about the thermal history of meteorites, with ²⁶Al heating and conductive cooling, the hard evidence in meteorites is more ambiguous. What is the maximum temperature recorded in a chondritic meteorite and how long was the meteorite kept at that temperature? What is the best thermometer? How fast was the heating? How fast did the meteorite cool from this temperature?

Some evidence, in particular from Pb-isotopes, seems to support the onion shell model with the most (thermally) equilibrated meteorites coming from the center with slow cooling compared to the less heated outer parts represented by meteorites with faster cooling. Other evidence contradicts this model, such as unequilibrated clasts in equilibrated meteorites. Ed Scott reviewed the chondrite data and emphasized the uncertainties in particular with regard to cooling rates.

One of the intents of the organizers (H. Palme, J. Ganguly and G. Kurat) of the special session was to make available the knowledge and experience of the thermal-history-modeling of terrestrial rocks to the history of meteorites. J. Ganguly applied his ideas about closure temperatures in terrestrial rocks to meteorites with some surprising results. By extending the classic work of Dodson he showed that cooling rates of meteorites can be calculated directly from the available data. The consensus among meteoriticists was that there is much to learn from terrestrial petrologists. Henning Haack reported the newest developments in the cooling history of iron meteorites. From his talk and from contributed papers it appears that microchemical methods such as Transmission Electron Microscopy may finally resolve the problem of almost annually changing cooling rates of iron meteorites. Also, the new W-isotope data will certainly improve our understanding of core formation in small planetesimals.

On the other side are the carbonaceous chondrites with little or no heating. Here there is still an ongoing debate about the significance of hydrous alteration on the parent asteroid. It is now clear that cation diffusion in minerals cannot have occurred while the Allende meteorite was inside a parent body. The precise upper limit of the maximum temperature on the Allende parent body is still not well known, certainly below 800°C as suggested by thermoluminescence.

Much hope rests with the development of new microchemical tools that will allow the study of zonations on a sub-micron level and thus lead to more precise determinations of cooling rates and to a better understanding of the thermal history of small planets.

Authors interested in this topic were invited to submit papers to Meteorites and Planetary Science dealing with the thermal history of meteorites before February 29, 2000. With this deadline it should be possible to publish accepted papers in the March issue of 2001 of Meteorites and Planetary Science

The Trouble with Pluto

Pluto was discovered by Clyde Tombaugh in 1930 and was thought to be the ninth and most distant planet in the solar system. However, Pluto is anomalous because of its small size, its highly eccentric orbit, and its icy composition. The recent discovery of small icy objects in the Kuiper belt raised the question whether Pluto should be reclassified as one of the many icy bodies that revolve around the Sun in the space outside the orbit of Neptune.

Members of the Division of Planetary Scientists of the International Astronomical Union objected to this proposal because Pluto has a spherical shape, because it has a tenuous atmosphere, and because it has a satellite named Charon. Besides, Pluto has attracted public attention because its origin is shrouded in mystery. In addition, Pluto is Mickey Mouse's much-loved dog in a Walt Disney movie released in 1930.

This episode in the history of astronomy ended when the International Astronomical Union rejected the proposal to reclassify Pluto. Therefore, our solar system still has nine planets whose names are recorded in the statement: My Very Educated Mother Just Served Us Nine Pizzas.

Space Resources Utilization Roundtable II

November 8-10, 2000, at the Colorado School of Mines in Golden, CO. Contact: simmons @ lpi. usra. edu or <http://www.lpi.usra.edu/meetings/resources2000/>

An Environmental Fable

Contributed by U. Aswathanarayana

Once upon a time in India three fishes lived in a pond connected to a perennial river. One fish named Dirghadarsi noticed that the water-level in the pond was decreasing and realized that the pond would soon become disconnected from the river. He told his two friends what he had observed and suggested that they return to the river while it was still possible to do so. However, they ignored Dirghadarsi's advice and he therefore left without them. The second fish (Praptakalajina) managed to escape from the shrinking pond at the last minute by means of a clever trick. The third fish, who had neither vision or cleverness, perished when the pond dried up.

International Ingerson Lecture

The next International Ingerson Lecture of the IAGC will take place during the 31st International Geological Congress in Rio de Janeiro, Brazil, from August 6 to 17, 2000.

The speaker will be:

Dr. Umberto G. Cordani
Professor, Instituto de Geociencias
Universidade de São Paulo

**"Crustal Evolution of the
South American Platform"**

The venue for this lecture will be the Riocentro in Rio de Janeiro at a date and time to be determined. Please consult the IGC Program for additional information.

Discovery of Diamonds in Canada

Gunter Faure

The history of mining in Canada includes numerous episodes of intense activity and drama associated with the discovery of various mineral deposits. Some prominent examples in the Province of Ontario include: The gold-bearing quartz veins in Timmins and Kirkland Lake, the Ni-Cu deposits of Sudbury, the U deposits of Blind River and, most recently, the discovery of Cu-Ni ores of the Kidd Creek orebody near Timmins and of native gold on the Trans-Canada Highway at Hemlo.

During the past decade, the attention of the mining industry of Canada has focused on the Lac de Gras area about 300 km north of Yellowknife in the barrenlands of the Northwest Territories. The occurrence of diamonds in several kimberlite pipes in this area was announced on November 5, 1991, but at first was not given much attention in Canada.

The credit for the discovery belongs to Charles Fipke who started searching for diamonds in 1978. He and other exploration geologists found kimberlite pipes in several areas in Canada and elsewhere in North America, and some of those actually contained diamonds. However, none proved to be suitable for mining. Eventually, the search shifted to the Northwest Territories where Charles Fipke and his partners in 1991 discovered several Early Tertiary kimberlite pipes including one at Point Lake which yielded 81 small gem-quality diamonds ranging in size from 1 to 3 karats.

The search for mineable deposits of diamonds benefitted significantly from the work of Dr. John Gurney of the University of Cape Town South Africa (and Councillor of the IAGC) who established that a pyrope garnet known as G10 is diagnostic for diamond-bearing kimberlite pipes.

Charles Fipke, who had formed a company called Dia Met, started staking claims in 1989 and in 1990 entered into a partnership with Broken Hill Proprietary (BHP), an Australian resource conglomerate with revenues exceeding \$20 billion per

year. The discovery of diamonds and the exploration in the Lac de Gras area by Dia Met and BHP precipitated a staking rush and a flurry of exploration in the area which ultimately resulted in the discovery of more than 150 kimberlite pipes some of which contain large concentrations of high-quality diamonds.

In 1995 the BHP-Dia Met partners submitted a report based on an environmental impact study that weighed 64 pounds and cost \$14 million. One year later, the environmental review panel approved the plans to develop the Ekati Mine, and in 1998 the Ekati Mine started production.

Mining at the Ekati Mine is by the open pit method. The mine will ultimately work five kimberlite pipes known as Panda, Koala, Fox, Sable, and Misery. The pit at the Panda pipe will reach a depth of 300 meters and a diameter of one kilometer. The rate of production of kimberlite is about 9,000 tonnes per day at the present time and is scheduled to rise to 18,000 tonnes per day as the other pipes come into production. The mining plan covers a period of 17 years and will ultimately result in mining 78 million tonnes of ore and 508 million tonnes of waste rock.

The processing plant, housed in the largest building in the Northwest Territories, will crush, screen, and grind the ore followed by separation of high-density mineral grains by heavy liquids. The diamonds are identified and sorted by x-ray analysis. The Ekati mine is expected to produce more than 3.5 million karats of diamond per year which amounts to about 6% of the global production. The average value of the diamonds in all five pipes is \$US 84 per karat, but the diamonds in the Panda pipe are worth \$US 130 per karat. The life of the Ekati Mine is projected to be 25 years and the gross revenues will exceed \$US 6 billion. The diamonds will be marketed by BHP through an office in Antwerp, Belgium.

The Ekati Mine is not only an engineering success, but also received high praise for involving the native population in the planning and execution of the project and for minimizing the impact on local wildlife. In fact, the caribou have taken to walking along the roads the mining company has built and are

given the right-of-way at all times.

Sources: *The Northern Miner*, vol. 84, No. 35, 1998. and Davis and Kjarsgaard, 1997. *Journal of Geology*, vol. 105, 503-509.

Plan to Attend the
Goldschmidt Conference
Oxford University
September 3-8, 2000

New Geochemistry Book

Schulz, H.D. and M. Zabel, eds. 2000. *Marine Geochemistry*, 455 pages, 241 Figures and 23 Tables. Springer Verlag, Heidelberg, Germany.

COMING EVENTS

Symposium on the Chemistry of the Early Solar System, August 20-24, 2000, Convention Center, Washington, D.C. Contact: < <http://www.acs.org/meetings/washington2000> > or Dr. Conel Alexander at < alexande@dtm.ciw.edu >.

63 Annual Meeting, Meteoritical Society from August 28 to September 1, 2000, Chicago, Illinois. Contact: < a-davis@uchicago.edu > or < mwadhwa@fminh.org >.

Goldschmidt 2000, September 3 to 8, 2000, Oxford, UK. Contact: < Gold2000@campublic.co.uk > or < www.campublic.co.uk/science/conference/Gold2000/ >.

International Symposium on Hydrogeology and the Environment, October 17-20, 2000, in Wuhan, P.R. China. Contact: < yxwang@cub.edu.cn > Fax: 86-27-8781365.

Sources, Transport, Fate, and Toxicology, sponsored by the International Association of Geochemistry and Cosmochemistry at the Annual Meeting of the Geological Society of America from November 9 to 18, 2000, in Reno, Nevada. Contact: Fax: 1-303-447-1133 or < <http://www.geosociety.org/meetings/2000/t-abs.htm#elec> > for electronic submission of abstracts by August 1, 2000.

Sixth International Conference on Acid Rain Deposition, December 10-16, 2000, Tsukuba, Japan. Contact at: < acid2000@ics-inc.co.jp >, Fax: 81-3-3263-7077.

Near-Earth Asteroid Sample Return Workshop, December 11-13, 2000 at the Lunar and Planetary Institute, Houston, Texas. Contact: < www.lpi.usra.edu/meetings/asteroid2000/ >.

AGU Fall Meeting, December 15-19, 2000, San Francisco, California. Contact: < meetings@kosmos.agu.org > or < <http://www.agu.org/meetings> >.

The Gondwana Platform During Ordovician Times: Climatic, Eustatic, and Geodynamic Evolution, January 30 to February 7, 2001, in Morocco. Contact: < hamoumi@wanadoo.net.ma >, Fax: (212-7) 68 01 81.

Joint SOHO-ACE Workshop on "Solar and Galactic Composition" March 6 to 9, 2001, in Bern, Switzerland. Contact: < http://www.cx.unibe.ch/phim/soho/soho_ace/soho_ace.html >. Conference fee approximately 400 Swiss francs, abstracts and registration due on Dec. 1, 2000.

The Jordanian Geologists Association will hold an International Symposium on Geology and Investment from April 2 to 4, 2001, in Amman, Jordan. Papers are invited on any topic related to the theme of the conference. More details are available at < <http://www.jordanian-geologists.com> >.

Third IAEA Symposium on Isotope Techniques in the Study of Environmental Change, April 19-23, 2001, in Vienna, Austria. Contact: < p.aggarwal@iaea.org >.

Goldschmidt 2001, May 20-24, 2001, Roanoke, Virginia, USA. Contact: Dr. Michael Hochella at < hocella@vt.edu > or Dr. Robert Bodnar at < bubbles@vt.edu >.

10th Water-Rock Interaction Symposium, June 10-15, 2001 at Tanka Village Congress Center, Villasimius, Sardinia, Italy. Contact: < wri10@unica.it > or < http://www.unica.it/wri10/ >.

Introduction of Professor Jerome O. Nriagu

by Gunter Faure

Our Guest of Honor and Keynote speaker this morning is Professor Jerome O. Nriagu who is the Director of the Environmental Health Sciences Program of the Department of Environmental and Industrial Health at the University of Michigan in Ann Arbor. Dr. Nriagu received his Ph.D. in 1970 from The University of Toronto and, for more than 20 years, worked as a Research Scientist (1972-1982) and Senior Research Scientist (1982-1993) at the Federal Canadian Department of the Environment, National Water Research Institute, in Burlington, Ontario.

Dr. Nriagu is one of the most frequently cited researchers in the field of environmental chemistry and was elected Fellow of the Royal Society of Canada in 1992. His reputation as an outstanding environmental chemist arises partly from the fact that he edited or authored 28 books between 1983 and 1998 on the occurrence of many different metals in the environment, including: Pb, Cu, Hg, Zn, Ni, Cd, Cr, As, V, and Tl. In addition, some of his books dealt with environmental biochemistry, sulfur in the environment, phosphate minerals, toxic contaminants in the Great Lakes, environmental impacts of smelters, toxic metals in the atmosphere and other related topics.

In many respects, Dr. Nriagu is one of the pioneers of environmental geochemistry and health whose work becomes increasingly relevant as more and more of us discover this important subject.

Third Theme Session at the Annual Meeting of the Geological Society of America Sponsored by the IAGC, October 26, 1999, in Denver, Colorado.

Gunter Faure and David Long presiding

Our theme session entitled: SOURCES, TRANSPORT, FATE, AND TOXICOLOGY OF TRACE ELEMENTS IN THE ENVIRONMENT was a tribute to **Professor Jerome Nriagu** of the University of Michigan for his pioneering work on trace elements in the environment. (See the summary of Dr. Nriagu's contributions to Environmental Geochemistry).

The presentations at our theme session included papers that detailed the evidence, discussed the analytical aspects of trace-element distribution, and considered the environmental consequences of the dispersal of trace elements. A listing of the names of the authors and the titles of their papers in the order in which they were presented follows below:

Hover, Victoria C.: TRACE METAL CYCLING IN CONTAMINATED ESTUARINE SEDIMENTS, HACKENSACK MEADOWLANDS DISTRICT, NJ.

Siegel, Frederic R., Kravitz, Joseph H., Galasso, Jennifer J. L.: CONTAMINANT AND BASELINE CONCENTRATIONS OF POTENTIALLY TOXIC ELEMENTS IN FIFTY-ONE 1965 CORES FROM KARA SEA TROUGHS, EUROPEAN ARCTIC: As, Hg AND OTHERS.

Icopini, Gary A., Long, David T.: SPECIATION OF DISSOLVED METALS USING SOLID PHASE EXTRACTIONS IN THE FIELD.

McCleskey, R. Blaine, Nordstrom, D. Kirk, Ball, James W.: FILTRATION TYPE, PORE SIZE, TIMING, AND SURFACE AREA EFFECTS ON TRACE METAL CONCENTRATIONS IN

SURFACE WATERS CONTAMINATED BY ACID WATERS FROM SUMMITVILLE, CO.

Kharaka, Yousif K., Ambats, Gil, Kakouros, Evangelos: SOURCES, TRANSPORT, TOXICITY AND REMOVAL OF SELENIUM FROM IRRIGATION DRAINAGE WATER.

Davis, James A., Lenhart, John J., Barger, John R.: SPECTROSCOPIC EVALUATION OF THE BINDING OF MALONATE TO HEMATITE AND ITS AFFECT ON LEAD SORPTION.

Brassard, Pierre, Martinez, Raul: DISTRIBUTION OF Cd AND Pb ON NATURAL SUSPENSIONS AS MEASURED BY MEMBRANE SEPARATION AND POTENTIOMETRY.

Smith, Kathleen S., Ranville, James F., Macalady, Donald L., Gebhard, Steven D.: THE LACK OF INFLUENCE OF ORGANIC MATTER ON TRACE-METAL SORPTION IN ACIDIC IRON-RICH ENVIRONMENTS.

Opening or Introductory Remarks: Gunter Faure

Nriagu, Jerome O.: GLOBAL CLIMATE CHANGE AND CYCLING OF TOXIC METALS.

Verplanck, Philip L., Nordstrom, D. Kirk, Mast, M., Yahar, Douglas B., Wright, Winfield G.: DETERMINATION OF METAL LOADING IN AN UNMINED, MINERALIZED BASIN, UPPER ANIMAS WATERSHED, SOUTHWESTERN COLORADO.

Neumann, Klaus, Graham, Elizabeth Y., Lyons, W. Berry, Rosi, Emma J., Meyer, Judy L.: IMPACT OF URBANIZATION ON RIVER CHEMISTRY: OXYANION CONCENTRATIONS IN THE CHATTAHOOCHEE RIVER, GEORGIA.

Ball, James W., Runkel, Robert, L., Nordstrom, D. Kirk: REACTIVE-TRANSPORT MODELING OF ACID MINE DRAINAGE DOWNSTREAM FROM

SUMMITVILLE, COLORADO: RESULTS OF A LOW-FLOW EXPERIMENT USING THE OTIS/OTEQ MODEL.

McArthur, John M., Nickson, Ross T.: POLLUTION OF GROUNDWATER BY NATURALLY-OCCURRING ARSENIC IN BANGLADESH AND WEST BENGAL.

Warner, Kelly L.: ARSENIC AND ARSENITE IN DEEP GLACIAL DRIFT AQUIFERS--LOWER ILLINOIS RIVER BASIN

Hinkley, Todd K., Matsumoto, Akizazu, Lamothe, Paul J., Wilson, Stephen A., Finnegan, David L. Gerlach, Terrence M.: VOLCANIC EMISSION OF METALS MATCHES METALS IN OLD ANTARCTIC ICE.

18th General Meeting of the International Mineralogical Association, September 9-13, 2002, Edinburgh, Scotland. Contact: < IMA@minersoc.demon.co.uk >.

6th International Symposium on Environmental Geochemistry, Edinburgh, Scotland, 2003. Contact: < J.G.Farmer@ed.ac.uk > or Fax: 0131 650 4757.

Plan to Attend the
International Ingerson Lecture
Professor U.G. Cordani
IGC 31, Rio de Janeiro
August 6-17, 2000

Plan to Attend the
Goldschmidt Conference
Oxford University
September 3-8, 2000

ACTIVITIES OF THE WORKING GROUPS

The eight Working Groups of the IAGC receive financial support from the Association to assist them in the planning and running of scientific meetings. Several of our Working Groups organized major events during 1999 that attracted large numbers of participants from all over the world. Many of these participants are not actually Members of the IAGC. This is not a problem because all persons who are interested in the topic of a particular conference being organized by one of our Working Groups are welcome to attend:

Meteoritics and Cosmochemistry, Herbert Palme, Jibamitra Ganguly, and Gero Kurat.

The Working Group of Meteoritics and Cosmochemistry organized a special session during the 62nd Annual Meeting of the Meteoritical Society from July 11 to 16, 1999, in Johannesburg, South Africa. The topic of this session was **The Thermal History of Meteorites** and featured three keynote speakers: Ed Scott, Jiba Ganguly, and Hennig Haack. These presentations reminded meteoriticists that the petrology of terrestrial rocks can contribute to an understanding of the origin and history of stony meteorites. Herbert Palme and the keynote speakers plan to publish a series of papers on the petrology of meteorites in the journal *Meteorites and Planetary Science*. In addition, Herbert Palme has prepared an Editorial on the thermal history of meteorites which is reproduced in full elsewhere in this issue of our Newsletter.

The most recent event staged by the Working Group on Meteoritics and Cosmochemistry was a conference on: **Catastrophic Events and Mass Extinctions** which was organized by Christian Koeberl of the University of Vienna from July 9 to 12, 2000. The topics considered at this meeting included: 1. Crises in Earth history; 2. Environmental consequences of impacts; 3. Mechanisms of mass

extinctions; 4. Atmospheric response to impacts; 5. Connection between impacts and volcanism; 6. Interpretation of stratigraphic records; 7. Extraterrestrial influences on the Earth; 8. Large-scale impact events in Earth history. The proceedings of this conference will be published as a Special Paper by the Geological Society of America. Manuscripts are due on October 1, 2000.

Water-Rock Interactions

W. M. Edmunds and L. Fanfani

The Working Group on Water-Rock Interactions held its Ninth International Conference in April of 1998 in New Zealand. The 10th Symposium on Water-Rock Interactions is scheduled to take place from June 10 to 15, 2001, in Villasimius, Sardinia, Italy. This event is being organized by Professor Dr. Luca Fanfani of The University of Cagliari.

The symposium will feature invited keynote speakers, oral presentations, and posters. The topics to be discussed include: 1. Geochemical cycles; 2. Modelling of water-rock interactions; 3. Groundwater quality; 4. Geochemical aspects of global change; 5. Mineral surfaces and weathering; 6. Trace metal mobility in stressed environments; 7. Biogeochemical processes; 8. Volcanic and geothermal processes; 9. Waste storage and disposal; Degradation of monuments; 11. Geochemistry of earth surface systems; 12. Geochemical processes of pollution; 13. Magmatic and metamorphic processes; 14. Marine and sedimentary geochemistry; 15. Organic matter and complexation; 16. Ore deposits and mineral forming processes; 17. Experimental geochemistry; 18. Thermodynamics and kinetics; 19. Stable and radiogenic isotopes; and 20. Natural hazards.

Additional information is available on the worldwide web at <<http://www.unica.it/wri10>> and by e-mail at <wri10@unica.it>.

Applied Isotope Geochemistry

Arne Råheim and Jean-Pierre Girard

The Third International Symposium on Applied Isotopes Geochemistry took place from September 21 to 25, 1999, in Orleans, France. This very successful conference was organized by Jean-Pierre Girard of the BRGM and attracted 90 registered participants from 18 different countries. The papers presented at this meeting included new analytical developments, studies of natural isotopic systems, as well as industrial and environmental applications.

The next meeting of the Working Group on Applied Isotope Geochemistry (AIG-4) will take place from June 25 to 29, 2001, at the Asilomar Conference Center in Pacific Grove, California USA (very close to Monterey). The conference is being organized by Thomas D. Bullen, Branch of Regional Research, Water Resources Division, U.S. Geological Survey, MS420, 345 Middlefield Rd., Menlo, Park, CA 94025 USA. Tel. 650-329-4577; Fax: 650-329-4538, e-mail: <tdbullen@usgs.gov>. All interested persons are invited to contact the organizer at his e-mail address as soon as possible.

Geochemistry of the Earth's Surface

Blair F. Jones and Sigurdur R. Gislason

The Working Group on the Geochemistry of the Earth's Surface staged a highly successful and well attended Symposium (GES-5) from August 16 to 20, 1999, in Reykjavik, Iceland. The scientific sessions were preceded by a spectacular fieldtrip led by Stefan Arnorsson, Oddur Sigurdson, and Sigurdur Gislason across a large segment of southern Iceland. The meeting attracted 160 participants who presented more than 140 papers distributed over 8 poster and 20 lecture sessions.

The topics covered by these presentations included: 1. Geochemical records of environmental change; 2. Environmental geochemistry and health; 3. Chemical weathering and climate; 4. Organic geochemistry; 5. Marine and sedimentary geochemistry; 6. Mineralogy, microbes, and chemistry of weathering; 7. Geochemical thermodynamics and kinetics; and 8. Geochemistry of crustal fluids and catastrophic events.

The participants submitted their papers in camera-ready form five months before the start of the Symposium. As a result, the Proceedings Volume, edited by Halldor Armannsson, was ready for distribution in August when the participants arrived in Reykjavik. This handsome book, containing 574 pages of text and figures including an author index, was published by A.A. Balkema, Rotterdam, The Netherlands.

The next Symposium of this Working Group (GES-6) will be held in Hawaii in 2002 and will be organized by Fred T. Mackenzie.

Thermodynamics of Natural Processes

German Kolonin, Chair

The Working Group of TNP held an interdisciplinary symposium on the "Genesis of PGE-bearing Sulfide Deposits" on March 30, 1999, during EUG-10 in Strasbourg. The Symposium included about 30 oral reports and posters presented by registered participants about half of whom were Russian scientists. The ensuing discussions about the physical-chemical aspects of the ore-forming process were very interesting.

The next symposium of this Working Group (TNP-3) will be organized by Professor Ronghua Zhang in 2001 at the Open Laboratory on Geochemical Kinetics in Beijing.

In the meantime, the Working Group on TNP cosponsored the Joint Sixth International Symposium on Hydrothermal Reactions and the Fourth International Conference on Solvo-Thermal Reactions which took place in Kochi, Japan, from July 25 to 28, 1999. The IAGC provided financial support to this event because of its association with our Working Group.

Geochemical Training in Developing Countries

U. Aswathanarayana, Chair

This Working Group is organizing an International Symposium on "Challenges of Water Resources Management in the Developing Countries." The Symposium will take place at Andhra University, Visakhapatnam, Andhra Pradesh, India, from May 6 to 9, 2001 and is dedicated to the memory of the late Professor C. Mahadavan.

In addition, Dr. U. Aswathanarayana published a scholarly book entitled: "Soil Resources and the Environment." The book was printed by Science Publishers Inc., Enfield, New Hampshire, USA, and was released to the public at the International Conference on "Geomedical Problems in the Developing Countries" on October 28 to 29, 1999 in Oslo, Norway.

The Working Group is also discussing with Dr. John Gurney of South Africa the feasibility of organizing a workshop on data-base management.

Working Group on Geochemistry of Health and Disease

Robert B. Finkelman, Chair

The Advisory Committee of this Working Group includes Jan Cramer, Norway; U. Aswathanarayana, Mozambique; B. Zheng, China; and Alan Welsh, USA.

The Working Group participated in the Sixth International Symposium on Metal Ions in Biology and Medicine, in San Juan, Puerto Rico, from May 7 to 10, 2000. In addition, the Working Group is represented at the International Symposium at Andhra University in India (see above).

Global Geochemical Baselines

Jane Plant and David Smith, Cochairs

The Working Group on Global Geochemical Baselines is jointly sponsored by the IUGS and the IAGC. The goal of this Working Group is to determine the chemical composition of soil, water, and air for all continents. The collection of samples and their analysis is supported in part by the Geological Surveys of individual countries.

The Working Group has scheduled a meeting for November 13 to 19, 2000 in Athens, Greece, to plan the publication of geochemical maps of Europe.

OTHER ACTIVITIES SUPPORTED BY IAGC

The IAGC occasionally provides financial support for Workshops or Symposia that are not directly linked to our Working Groups. In the year 2000, we are supporting:

The 31st International Geological Congress, August 7 to 17, in Rio de Janeiro. The IAGC has organized a Technical Session (14-5) on the topic: "Sources, Transport, Fate, and Toxicology of Trace Elements in the Environment" chaired by David Long and Gunter Faure. The poster session on August 15 will be followed by three keynote addresses given by: Michael Powell (Canada), David Long (USA), and R. Boyd (Norway).

APPLIED GEOCHEMISTRY

A Story of an Unqualified Success

by Gunter Faure

Applied Geochemistry started publication in January of 1986 as the Journal of the International Association of Geochemistry and Cosmochemistry. The first three issues constitute a Festschrift dedicated to the late Professor F. Earl Ingerson who takes credit for being one of the founders of the IAGC and its first President (See elsewhere in this issue).

The first issue of Applied Geochemistry contains an Editorial by Brian Hitchon, first Executive Editor of Applied Geochemistry, in which he spelled out the scope of the journal:

"**Applied Geochemistry** is the official journal of the International Association of Geochemistry (I.A.G.C.). Publication of the journal is one way in which the Association can achieve its principal objective which is to foster cooperation in, and advancement of, geochemistry and cosmochemistry in their broadest sense. The activities of the Association and the scientific scope of the papers published in Applied Geochemistry both reflect the very diverse interests and applications of the world community of geochemists. The title Applied Geochemistry was chosen for two reasons: (1) it reflects the fact that the science of geochemistry is mature, and its application to a wide variety of problems can benefit all mankind; (2) it is a sister journal and complementary in scope to the more theoretically oriented *Geochimica et Cosmochimica Acta*."

The growth of our journal since its inception is evident in the graph that accompanies this report. The spectacular growth that has occurred since 1985 is largely attributable to the dedication and skill of Ron Fuge, the Executive Editor of our journal. Thanks to his efforts, **Applied Geochemistry** has become one of the principal assets of the IAGC and a major benefit to its Members.

Applied Geochemistry Editor's Report

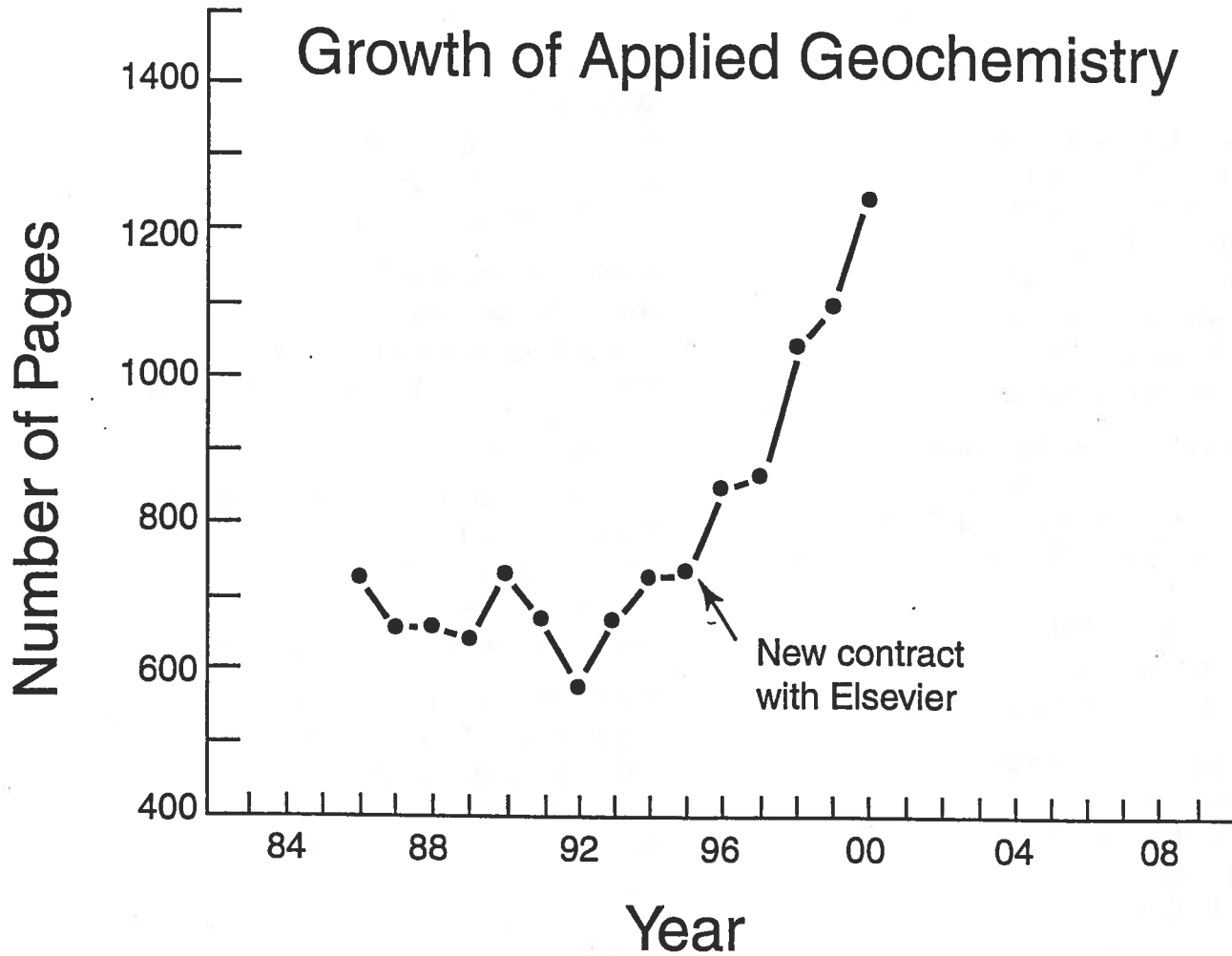
by Ron Fuge

I am pleased to report that the journal is extremely buoyant and that the advances we made in the previous year have been maintained. During 1999 we published 75 papers in 8 issues on 1101 pages of the journal. During the last 12 months, I have received 170 manuscripts which does not include special issues and conference volumes. In view of the large numbers of manuscripts, we have been publishing the journal at an accelerated rate and the whole of volume 14 was issued by early October of 1999. We are still rejecting about 40% of submitted manuscripts but recently this rate has increased a little.

Within volume 14 we published one special issue on the Aspo Hard Rock Laboratory edited by Mel Gascoyne and Peter Wikberg, both of whom I thank for carrying out the task very efficiently. In volume 15 we intend to publish selected papers from a conference held in Hong Kong in December 1998 on Environmental Geochemistry. In addition, special issues on Yucca Mountain, organized by Mel Gascoyne, and the proceedings of the 5th International Conference on Environmental Geochemistry in Cape Town in April 2000 are in the pipeline.

In view of the large influx of manuscripts, volume 15 will increase in size to 10 issues with a page budget of 1250. I estimate that this will allow us to publish 85 to 90 papers with a rejection rate of about 45 to 50%. It is possible that further expansion will be needed of volume 16 to be published in 2001.

The increased influx of manuscripts and the increased frequency of publication have resulted in an increased editorial workload. Basically I think we need a few more Associate Editors in specific areas. In addition, I feel that I need some help with final editing of manuscripts. At the moment, given the procedure at the publishers, I need to read every manuscript before it leaves my desk to check that it is in the right format and is written properly.



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