

IAMG

Newsletter

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IAMG Requires Additional Mirror Sites for WWW Services

The IAMG web service would like to establish mirror sites in Europe, Australia, South America and Asia.

Access to the IAMG web site for users outside of North America has been reported to have very slow response times. This can be overcome by setting up mirror sites in areas where the demand for the IAMG web site is commonly requested. Mirror sites are "mirrors" or replicas of the primary IAMG web site (<http://www.iamg.org>) that is currently located at the Geological Survey of Canada, Ottawa. Mirror sites can be established so that updates to the primary web site are downloaded on a daily basis. In order to do this the IAMG requires people who have the skills and knowledge to set up and manage a mirror site. Another alternative is someone who has authority over an existing web server with staff capable of administering a mirror site. Successful mirror sites require a commitment to ensuring timely updates so that users of the IAMG web pages are getting the latest information. Any volunteers for assisting in the development and maintenance of IAMG mirror sites would be gratefully appreciated.

For further information please contact:

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The Germans are celebrating. Among the many great anniversaries this year was the 250th birthday of Johann Wolfgang von Goethe, the "poet prince" of the classic period of German literature. Actually, Goethe was more than just a poet and playwright - he was a prolific writer on all kinds of topics of the day as well as science. Well known is his treatment of the theory of colors to which he made significant contributions. So, it is not surprising that Goethe voiced his opinions on various problems in mineralogy, ore geology and mathematics and statistics as well. (Although Goethe knew all the great minds of Europe at that time, I've not been able to establish if he was actually acquainted with R.G.V.Eigen).

From the Editor
From the Editor
From the Editor

Goethe amassed a large collection of minerals and rock specimens mostly from Bohemia and the Harz mountains which he described in detail. He also published his descriptions of other, public collections. He emphasized looking at the large scale geology and tried to interpret the origin of various types of rocks and geological features he observed: "Nature because of her omnipresence acts close-in as well from the distance and into the distance; both effects should always be observed, and the one kind of observation should not supersede the other."¹ In his holistic view, Goethe found himself in disagreement with the Newtonian mechanistic world view. He also didn't hold back against the mathematicians who, in his view, were making things much more complicated than necessary: "...that one not only introduces the higher and more complicated formulas into life when the first and simple ones don't suffice, but that one unnecessarily uses the former instead of the latter and makes the task harder and more time consuming"² On other occasions Goethe waxes polemic, "...bemoan the limitless witchcraft formulas which cover up like dunes the principles of polarization of light, such that no one can distinguish whether a body or a wreck is buried underneath"³

Goethe was not really against the use of mathematics where appropriate, but he objected to unwarranted complications in science and warned against losing oneself in too much detail. In this respect he predicted the geologic philosophy of our time: to integrate all available details into a big picture and to apply all reasonable methods, including numerical techniques, to solve the scientific problem.

Harald S. Poelchau

¹Translation from Gesammelte Werke Bd. 40: "Mineralogie und Geologie" Essay: "Freimütiges Bekenntnis"

²Translation from Gesammelte Werke Bd. 40: "Ueber Mathematik und deren Mißbrauch", Teil III.

³ibid. Teil II

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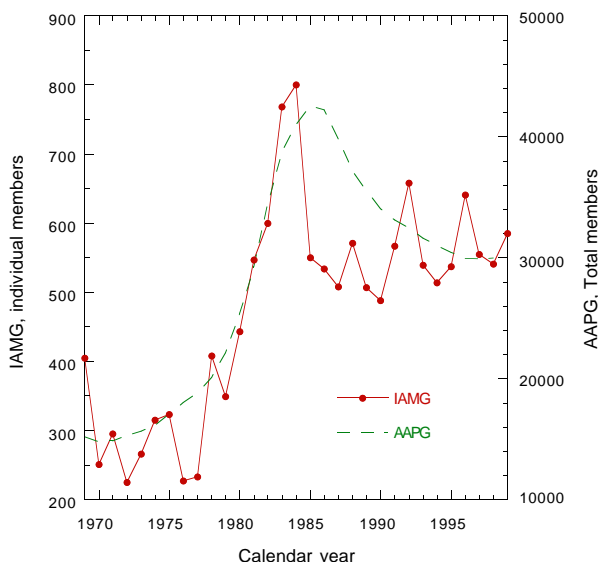
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PRESIDENT'S FORUM

Summary statistics are a good way to gain insight about any organization. Looking at the number of individual members, the IAMG has achieved approximately a 50% increase since the end of 1969, the first year that the Association started to send out notices and to collect dues. The most remarkable aspect in the 30 years of records is the maximum membership of 800 reached in 1984. The increase is so significant and looks so anomalous, that many have been tempted to blame it on an error or a change in the accounting practices of the treasurer. This is the main reason why the American Association of Petroleum Geologists (AAPG) membership curve is



superimposed on our curve—to provide perspective. Information about AAPG membership immediately gives credibility to our all-time high of 1984. Besides, the same graph shows that AAPG has approximately doubled its membership in the last 30 years, which is exactly what has happened to IAMG since 1971.

Considering a certain commonality of interests between the two organizations and at the same time the complete independence of their governments, one is forced to conclude that the long range growth of earth science organizations is controlled to a large degree by external events, in particular the price of crude oil in this instance.

Another salient aspect of our membership count, not shared by the AAPG data, is the high frequency fluctuation, which may be related to the difference in the orders of magnitude of the population sizes. The AAPG's count has more inertia given by the big counts. It is worth noticing the high regularity in the IAMG's maxima in the last 20 years. While I have already mentioned that the all-time high was primarily the effect of changes in the price of crude oil, I do not have an explanation for the 1988 maximum. The 1992 peak was the pay-off of a vigorous membership drive during the previous two years, while the 1996 maximum resulted from forcing all participants in the IAMG'95 conference to become members of the Association, a practice that went into effect in 1996 and has since been abandoned. The emerging increase observed in 1999 is again the result of another massive effort to attract new members, attempt to keep the ones we have, and invitation to reinstate those in arrears. As for the 4-year cycle, one may suspect that the phenomenon may be related to the 4-year term in office for the members of Council governing IAMG.

Lessons from the analysis of the fluctuations in membership advise a more continuous effort to attract members. It appears that each time IAMG restricts itself simply to sending renewal notices without any followup, things tend to go south promptly, which creates a reaction that starts the next cycle. Better coordination and continuity between members of succeeding Councils and with members of the Membership Committee seem to be in order.

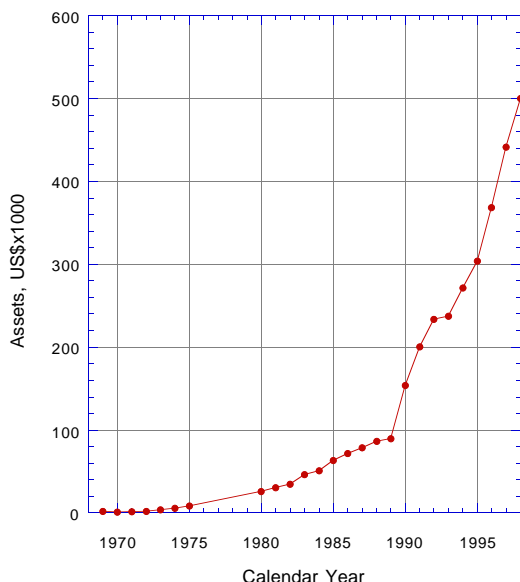
Another interesting source of information is the IAMG's fluctuation of assets, as revealed by the records from the Treasurer (the Western Treasurer up to 1996). Although I published the membership curve for the first time five years ago in Newsletter 49, this second graph is brand new and tells a much brighter story. While membership increased by 50% in the last 30 years, our assets have gone up by 27,000% starting from the equivalent of US\$1,800 at the end of 1969. From what I have been able to recover from records in the Archives, 1970 is the only year in which the Western Treasurer closed the books in the red.

During 1969, the main source of income was the membership dues, but

increasingly the dues have been replaced in importance by the royalties paid by the publishers of our journals, particularly after 1989 when, after a five year litigation, President **J. C. Davis** compelled Pergamon to start paying royalties for "Computers & Geosciences." The only break in the subsequent steep climb in assets occurred in 1993, when the Western Treasurer almost went into the red again, paying for the Association's celebration of its 25th anniversary.

In 1996 membership dues were abolished. Today, when members make their payment to the IAMG Treasurer, they are paying at cost for the subscription to journals. The Association does not retain a cent in the operation. Basically, the IAMG Treasurer is a collection agent for the publishers of our three journals. The practice goes back to 1973, when IAMG only had "Mathematical Geology." Plenum collected subscriptions directly between 1969-1972 and chaos and confusion were rampant—IAMG hardly knew who was a member and complaints about irregularities in the delivery of the journal were a nightmare. Since 1973 it has been mainly a matter of mutual convenience to have the IAMG Treasurer receive all payments: the publishers do not need to hire a person to do the job for them and our Treasurer has control of the membership list. Today, the second source of true income is the interest that we receive for our investments.

There are at least three main lessons to learn from the second graph. The Association has been much more successful financially than it has been



in attracting individuals to join. At least today, money is not a problem for the IAMG, and we continue to have more difficulties making our membership curve go up than increasing our assets; an enviable position to many.

Second, the Association has become almost dangerously dependent on royalties from "Computers & Geosciences" and "Mathematical Geology" for sources of income. Last year,

not counting a fortuitous gain of US\$29,738 on a sale of stock, our true income was US\$74,283, of which US\$60,837 (82%) came from royalties, with the rest coming from interest on investments that have been possible due to past royalties (Newsletter 58, p. 5). This form of income is quite unique among professional societies, which depend much less heavily on royalties and make more money from conferences, membership dues, and advertisement. At a time when increasing subscription rates for libraries and free flow of information on the Internet are threatening to severely alter the way technological and scientific knowledge is disseminated, the IAMG has a big interest at stake.

Finally, the Association has been able to accrue assets at such a surprising rate because of a combination of good management, operation wholly by volunteer work without a single paid staff member, and restraint in spending. After accumulating assets worth about 7 years of average true income, I believe the Association has put aside a big enough nest egg against a rainy day, to warrant moving expenditures more in the same ball park as our income. Considering that our business is that of a non-profit organization to promote mathematical geology, I have my reservations about the wisdom of continuing to accrue wealth for the sake of accruing wealth at the rate that we have done in the last decade. By no means I am inviting irresponsible spending. Instead, I am encouraging creative thinking aimed at expanding the Association's activities with good new programs. A couple of independent commissions are currently working on the preparation of guidelines to implement the Student Grant Program and the Lectures Series suggested in the previous issue of this Newsletter (p. 3). If these new initiatives are approved by Council, I believe that the Association will better fulfill its mission, function at a level more in accordance with its financial potential, and perhaps even increase membership!

Ricardo Olea

Association Business

CERTIFICATE OF APPRECIATION FOR CORA COWAN

After working for 15 years as the secretary of the Mathematical Geology Section of the Kansas Geological Survey, Cora Cowan retired last summer.

During all these years, Cora supported particularly the work that Daniel F. Merriam, John C. Davis, and myself have been doing for the Association. Cora's contributions in this category have been valuable and too numerous to list here. As is the case with Councilors and committee members, while working for IAMG she did not receive a single penny in honoraria, with the important difference that Cora has never been a member of the Association, not for her lack of care for the Association, but mainly because she is not a mathematical geologist.



Cora also took a very active and crucial role in accommodating our visitors over these years, helping them to get established here in Lawrence. Understandably, most of those visitors were IAMG members, and many are now her close friends, which speaks for itself about the quality of her support.

For Cora's valuable work behind the scenes, the Council decided to present her with the first IAMG Certificate of Appreciation at her retirement dinner. The citation reads:

"To Cora Edith Cowan for 15 years of generous and outstanding secretarial support of the Association."

Ricardo Olea

IAMG Education Committee

To date, three articles have appeared in the IAMG 'Studies for Students' Series, all of them in the *European Journal of Soil Science* (v. 48, p. 557-566; v. 49, p. 161-173; v. 50, p. 185-206). Other articles are also in various stages of preparation. Is this a success, or isn't it!

For those IAMG members who aren't completely familiar with the Series, its aims are: (1) to be an open-ended series of articles on mathematical geology in its broadest sense, articles that lead by example, (2) to contain articles that show how particular types of work are properly done, and (3) to have its articles published in the journals where they will have the greatest impact on those who need to see them. Some of those articles will certainly be best published in our own IAMG journals, but others will be better published in journals dealing directly with other geological topics.

This last characteristic of the Series - the publication of articles on mathematical geology in non-IAMG journals - was a highly controversial one when the Education Committee first mooted it. We were told again and again that no other journals would be interested. But far from it! The response from the editors and societies we approached was almost 100% positive - and that includes prestigious international journals such as the *Journal of the Geological Society of London*, the *Journal of Sedimentary Research*, *Geophysics*, and *Palaeontology*. Moreover - and this is most important - there was in many cases a plea for suitable articles. The editors of these journals realise the importance of quantitative approaches in their particular fields (perhaps we IAMG members just take it for granted); they know that most workers in these fields do not at present have ready access to articles showing what can be done and what should not be done (How many times do we see the same mistakes being made, again and again?); and they are asking for our help.

I'll give just one example of the sort of request that has come to me from editors. "Turbulence (made easy)" - a request from a journal that is widely read by sedimentary geologists. Yes, of course there are chapters on turbulent flow in every hydraulics textbook, but the treatment of turbulence in these books is almost always aimed at engineers, not at geologists. And yes, there certainly are introductory remarks on turbulent flow in almost every sedimentology textbook, but these remarks typically provide no more than a picture-book view of turbulent flow and transport phenomena. The sedimentary geologist who wants to appreciate these phenomena in a properly quantitative way (and who wants then to be able to go further in looking at how new developments in the study of turbulence are changing our ideas of how sediment is eroded, moved and deposited) is at present not at all well served.

There are many other examples: please contact me for details. Within the IAMG's ranks (or within the ranks of our non-IAMG colleagues)

Lecture Series Commission

The IAMG Council approved the following appointments to the new Lecture Series Commission:

Hernani A. F. Chaves, University of Rio de Janeiro, Brazil
<hernani@uerj.br>

Jaime Gómez-Hernández, Polytechnic University of Valencia, Spain
<Jaime.Gomez@stanford.edu>

Michael Ed. Hohn, West Virginia Geological Survey, USA
hohn@geosrv.wvnet.edu>

Thomas A. Jones, Exxon Production Research Co., USA
<tom.a.jones@exxon.sprint.com>

Soenke Rehder, Federal Institute for Geosciences and Natural Resources, Germany <s.rehder@brg.de>

W. Edwin Sharp, University of South Carolina, USA, **Chairman**
<n310001@vm.sc.edu>

The purpose of the Commission is to establish guidelines to bring traveling mathematical geologists to industry, universities, and local professional groups. Once such guidelines are approved by Council, a Lecture Series Committee will be in charge of actually selecting places and lecturers. Members of the Commission will have preference to serve on the Committee depending on performance and willingness to participate in the actual scheduling of the lectures.

Despite advances in electronic communication, there is an understandable desire from many earth scientists to interact live with leaders in their fields. Conference attendance remains the primary way to interact and exchange ideas personally with leading mathematical geologists and other colleagues sharing common interests. Realistically, at today's constantly increasing prices, it is difficult to attend any international conference without spending the equivalent of about US\$1,500. Several geomathematicians still have the luxury of being able to travel to technical meetings with expenses covered by their employers. Increasingly, however, we hear of budget cuts and restrictions, which make travel more difficult to finance.

There are at least four groups of geomathematicians for whom travel has been perennially almost impossible: 1) in countries going through economic hardships or having inconvertible currencies; 2) self-employed geomathematicians or consultants; 3) retired but still active researchers; 4) students. Year after year, organizers of our conferences are confronted with requests from geomathematicians from around the world who would like to present accepted papers, but have to withdraw because of lack of domestic support or support from IAMG. Sending experts to the job site instead of continuing the unilateral practice of holding conferences should have the additional benefit of increasing the interest in mathematical geology of those who are unwilling to travel halfway around the globe to learn more about mathematical geology, but who may be willing to go across the street to hear what has been announced as an interesting and challenging speech.



GUIDELINES FOR MEETING GRANTS

The Grant Commission consisting of **Thomas A. Jones (chair)**, **John Doveton**, **Eric Verrecchia**, and **Gert Jan Weltje** have prepared guidelines to decide on funding of meetings other than the regular IAMG conferences. The detailed report is now available on the IAMG website under http://www.iamg.org/meeting_grants.html

See you in Cancun!?

IAMG's annual conference in the year 2001 will be held in Mexico in the tropical resort of Cancun, September 6-12. Jorgina A. Ross of Kansas Geol. Survey is the Conference Chair person; local support comes from PEMEX and CFE. In addition to state-of-the-art geosciences, the meeting will emphasize (1) the development and use of mathematical geological models and geological simulations, and (2) all aspects of quantitative mapping of geological properties, from geostatistical estimation to automated cartography and map production.

See <http://www.kgs.ukans.edu/Conferences/IAMG/index.html> and pre-register now!

are certainly the people who can write the necessary articles, both on topics that have been requested and on topics that they themselves choose. So far, just a few people have volunteered. Many more are needed. Ultimately the success of the 'Studies for Students' Series will not be measured by how many articles appear. It will be measured instead by the extent to which we, the mathematical geologists of today, are prepared to spread the 'mathematical geology approach' into those other parts of geology that now want our help.

John Tipper
Chairman, IAMG Education Committee
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THE ARTISTIC SIDE OF THE KRUMBEIN MEDAL

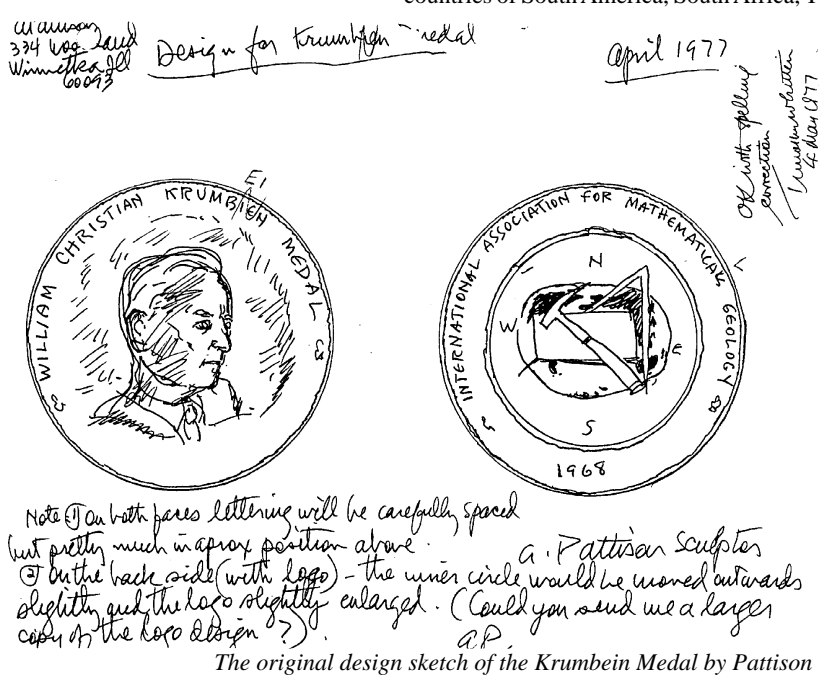
I was at my office at the University of Florence, ready to teach my afternoon class, when a message popped up on my computer screen. It was a request to assist the IAMG in ordering 17 Krumbein Medals at a local foundry.

The William Christian Krumbein Medal was established in 1976 during the XXV International Geological Congress in Sydney. The Association commissioned recently elected Secretary General **E. H. Timothy Whitten** to supervise the design and casting of the medal. Krumbein himself suggested his former neighbor, sculptor Abbot Pattison, for the design of the medal, to which the Association agreed (see fig. at right). Casting of 23 medals took place in 1977 at the Fonderia Artistica Ferdinando Marinelli in Florence, Italy, where the sculptor used to cast his work. The medal measures 96 millimeters in diameter and contains slightly over 500 grams of bronze. The bust of Krumbein and the signature of the artist are on the front side of the medal, and the Association's logo is on the reverse side.

Abbott Pattison was a graduate from the Yale School of Fine Arts. He died peacefully in his home on April 16, 1999, at the age of 82. Bill Pattison, his son, told me over the phone that for the last 10 years of his life, his father lived year-round at his ocean front home in Lincolnville, Maine, USA, and that he was buried in Lincolnville, one kilometer from his home. Up to the very end of his life, Pattison continued his life long profession of making works of art in many media. He loved painting, carving wood and marble, welding steel and brass, but he is probably best known for his many works of art cast in bronze by the Fonderia Marinelli. In fact, Abbott received a plaque presented to him by the mayor of Florence in honor of his 40 years of nearly annual visits to the city to work with the foundry.

In 1919, Ferdinando Marinelli took over the Gabellini Foundry and started his own artistic production. By 1922 he began to produce big bronze groups, such as equestrian monuments for the governments of different countries of South America, South Africa, Thailand, Hong Kong, Canada,

United States of America, Poland and Hungary. In 1930 he produced one of his most famous works — "The Pioneer's Wagon". This sculptural group in bronze is 22 meters long at the base and weighs about 16 tons. It was commissioned from Montevideo, Uruguay, and it was such a magnificent piece that it went on display at the Parterre of Florence before being taken down and shipped to South America. Then Marinelli produced an equestrian bronze statue of Louis XIV from an original model by Bernini, commissioned by the Louvre Museum. This casting opened the doors to a life-long activity in the reproduction of famous works. Fonderia Marinelli contains numerous casts of important works performed in collaboration with important artists and sculptors such as Abbott Pattison (see photo below left).



The Fonderia Marinelli

The foundry is named after its founder, Ferdinando Marinelli, who was born in 1887 in Pégaro, a little village in the province of Perugia, from where his parents went to Florence to look for better job opportunities. Ferdinando Marinelli's artistic training started as an apprentice when he was still a teenager learning, among other techniques, the casting of lost wax. When he was eighteen years old he opened a shop in the artisan center of town, and he began to produce small studs, bas-reliefs and medals besides working in mechanical and artistic foundries. During the World War (1915-1918) he worked at the Officine Muzzi foundry.

After Ferdinando Marinelli's death in 1958, his sons Marino and Aldo carried on the artistic work. Today, Ferdinando Marinelli, Marino's son, carries on the family tradition, keeping alive the ancient techniques of working and making reproductions of classical sculptures and works of famous modern artists.

Antonella Buccianti

Conference Report: Mining Příbram

The Last Session of Mathematical Geologists at the Mining Příbram Symposium 1999

The traditional international section "Mathematical Methods in Geology" of the Mining Příbram Symposium 1999 was held jointly with the international section "Geoethics" in Prague, October 4 - 8, 1999. The Regional Center of the IAMG in Prague served as co-sponsor of the meeting and a grant of the IAMG made it possible to cover registration fees for 18, and also local expenses for 12, active participants from 6 countries: Egypt, Poland, Romania, Russia, Slovakia and Ukraine. This simple fact proves that economic conditions for the meeting made it possible - thanks to the mostly voluntary work of organizers - to ensure a large accessibility incomparable with other meetings elsewhere. Altogether 79 specialists from 17 countries of Europe, Asia and Africa took part in the meeting held at the usual Krystal Center (where also the IAMG Silver jubilee meeting in 1993 was organized). The highest representation came from Russia (35 active participants from 15 institutes in 7 cities), followed by the Czech Republic (9 persons).

Sixty papers concerning Mathematical Geology were presented, whereas in the Proceedings volumes 129 complete papers or extended abstracts have been published. The respective numbers for Geoethics: 9 papers presented, 27 contributions published. The program for the section on Mathematical Geology consisted of three principal themes concerning the application of mathematical methods and computers: **Mineral Resources** (53 contributions, 24 presented); **Environmental Problems** (28 contributions, 11 presented); **Other Problems** (48 contributions, 25 presented).

Everybody regretted that this was the LAST meeting of a long series originated in 1968. Unfortunately there are many reasons for not continuing the successful series. My old dream to bring together people from the East and West in an equilibrium - eroded already by the separatist IAMG Silver anniversary meeting in 1993 - has been destroyed after three consecutive unsuccessful efforts to organize the IAMG annual meeting jointly with the traditional Příbram Symposia in the IAMG birthplace Prague. There is also no more reason to continue with the activity of the Regional Centre of the IAMG in Prague, especially when new phenomena are arising (highly increasing expenses for bank service, more complicated contacts with the East, etc.).

The participants were informed about the activities of the IAMG in a special poster and **Isobel Clark** kindly reported about the recent Trondheim IAMG Annual Conference.

Vaclav Nemeč

IAMG Journal Report



New MG Deputy Editor

The IAMG Council has approved the recommendation by the Publications Committee to appoint **W. Edward Sharp** Deputy Editor of the journal *Mathematical Geology*. Editor-in-Chief **Michael Ed. Hohn** intends to have a transition period of two years, with Ed becoming Editor-in-Chief starting with the preparation of volume 34, no. 1, to appear in 2002.



BEST PAPER 1996 AWARD FOR MATHEMATICAL GEOLOGY

Each year, the editorial board of *Mathematical Geology* selects an outstanding paper published in that journal to receive the Best Paper Award. The best paper selected for 1996 was: "Topologic and Geometric Characterization of Fault Networks Using 3-Dimensional Generalized Maps." The authors are **Yvon Halbwachs** with the Université Louis-Pasteur, Strasbourg, and **G. Courrioux**, **Xavier Renaud**, and **Philippe Repousseau**, with the Bureau de Recherches Géologiques et Minières, Orléans, France (MG, vol. 28, no.5, p. 625-656).

In selecting a best paper, the editorial board used the following criteria: a best paper represents a significant advance by presenting a new concept or method with important applications, or a breakthrough on a long-standing problem; is well-written, clearly-illustrated, and referenced comprehensively; and is likely to be cited often in the literature for many years. In making this selection, one member of the board commented that this paper was "very well documented and illustrated a promising domain of computer applications." To recognize their achievement, the authors will each receive a year's membership in the IAMG with a subscription to *Mathematical Geology*.

Michael Ed. Hohn
Editor-in-Chief
Mathematical Geology



C&G Best Paper Award for 1998

The 1998 award for Best Paper in *Computers & Geosciences* goes to **James Syvitski**, **Kenneth Skene**, **Murray Nicholson** and **Mark Morehead** for their paper "Plume1.1: Deposition of sediment from a fluvial plume" which appeared in volume 24, number 2, pages 159-171, and was accompanied by computer code now publicly available on the IAMG server. Each winning author will receive a free subscription to *Computers & Geosciences* for one year.



IAMG Back Issues Exchange

Following my own recent experience of sorting past issues of IAMG publications, I expect that many (especially those who have changed address from time to time) will have both duplicate issues and missing issues of *Mathematical Geology*, *Computers and Geosciences*, and *Nonrenewable Resources / Natural Resources Research*. If you find that you have any issues either surplus or missing, please let me know and I shall try to match you with other members who need your copies or can fill the gaps. The idea is that this would be done, where possible, entirely free of charge other than postal costs (if significant). This informal exchange service is additional to the normal back issue service, and may help you to complete your series at no more than the cost of postage. I shall start the ball rolling with two lists, of 'haves' and 'wants'. If you wish to take part in this, please let me know by e-mail (steve.henley@emine.com) or by fax (+44 (0)1629 581471).

Stephen Henley

Duplicates available:

C&G — v19. no.1,2; v21. no.7 v22; no.1,2,3,4,5,6,7,8,9; v23. no.1,2,5,7,8,9

Math Geol — v24. no.2; v25. no.2

NR — v1. all; v2. all; v3. all;

Missing issues wanted:

C&G — v2. no.3, 4; v8. no.1; v18. no.4, 10; v19. no.9

Math Geol — v24. no.3, 8; v25. no.8; v26. no.1, 2



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NATURAL RESOURCES RESEARCH

(formerly Nonrenewable Resources)

v. 8, no. 1 (1999)

- Merriam, D.F., Editorial: The new Natural Resources Research
 Brynes, A.P., and Lawyer, G., Burial, maturation, and petroleum generation history of the Arkoma Basin and Ouachita Foldbelt, Oklahoma and Arkansas
 Cheng, Q., and Agterberg, F.P., Fuzzy weights of evidence method and its application in mineral potential mapping
 Schuenemeyer, J.H., and Drew, L.J., Uncovering influences on the form of oil and gas field size distributions
 Chen, Z., and Sinding-Larsen, R., Estimating petroleum resources using geo-anchored method - a sensitivity study
 Costa, J.F., and Koppe, J.C., Assessing uncertainty associated with the delineation of geochemical anomalies
 Merriam, D.F., Herzfeld, U.C., and Fuhr, B.A. - An integrated mapping approach to petroleum exploration on the Pratt Anticline, Pratt County, Kansas
 Book Reviews

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- Merriam, D.F., Cooperative efforts: an editorial
 Harris, D., and Pan, G., Mineral favorability mapping: a comparison of artificial neural networks, logistic regression, and discriminant analysis
 Singer, D.A., and Kouda, R., Examining risk in mineral exploration
 Méndez, M.J., and Scherer, W., Artificial maturation of organic matter from Recent Venezuelan sediments
 Drew, L.J., Karlinger, M., Armstrong, T.R., and Moore, R., Relations between igneous and metamorphic rock fracture patterns and groundwater yield from the variography of water-well yields — Pinardville Quadrangle, New Hampshire
 Yamamoto, J.K., Quantification of uncertainty in ore-reserve estimation: application to Chapada copper deposit, State of Goiás, Brazil
 Carranza, E.J.M., Mangaoang, J.C., and Hale, M., Application of mineral exploration models and GIS to generate mineral potential maps as input for optimum land-use planning in the Philippines
 Book Reviews

NRR v. 8, no. 3 (1999)

- Gosnold, Jr. W. D., Stratabound geothermal resources of North Dakota and South Dakota
 Filho, F.N., Suslick, S.B., and Walls, M.R., Managing technological and financial uncertainty: a decision science approach for strategic drilling decisions
 Chungcharoen, E., and Fuller, J.D., Including geological uncertainty and economic analysis in a rapid simulation of hydrocarbon exploration
 Duncan, R.C., and Youngquist, W., Encircling the peak of world oil production
 Sahoo, N.R., and Pandalai, H.S., Integration of sparse geologic information in gold targeting using logistic regression analysis in the Hutti-Maski schist belt, Raichur, Karnataka, India - a case study
 Book Reviews

MATHEMATICAL GEOLOGY

Volume 31, Number 7 (1999)

SPECIAL ISSUE: MODELING SUBSURFACE FLOW

- Foreword — J. J. Gómez-Hernández
 Permeability Upscaling Measured on a Block of Berea Sandstone: Results and Interpretation — V. C. Tidwell and J. L. Wilson
 Transverse Dispersion of a Kinetically Sorbing Solute — A. K. Mishra and A. Gutjahr
 Dispersive Particle Transport: Identification of Macroscale Behavior in Heterogeneous Stratified Subsurface Flows — A. Fadili, R. Abadou, and R. Lenormand
 Fast 3D Reservoir Simulation and Scale-up Using Streamtubes — R. C. M. Portella and T. A. Hewett
 Well Conditioning in a Fluvial Reservoir Model — A. Skorstad, R. Hauge, and L. Holden
 The 2D Steady Hydraulic Head Field Surrounding a Pumping Well in a Finite Heterogeneous Confined Aquifer — C. L. Axness and J. Carrera
 Simulation of Non-Gaussian Transmissivity Fields Honoring Piezometric Data and Integrating Soft and Secondary Information — J. E. Capilla, J. Rodrigo, and J. J. Gómez-Hernández



IAMG ELECTIONS

Time is running out for the present (1996-2000) Board of IAMG. Elections for the Officers and Council (2000-2004) will be held in the spring of 2000, and the elected officers and councilors will be installed at the General Assembly in fall of 2000. In July 1999 the IAMG Council appointed the following Nominating Commission: **Clayton V. Deutsch**, University of Alberta, Canada, **Dan Gill**, Geological Survey of Israel, **Harald S. Poelchau**, Research Center Jülich, Germany, **Roberto Potenza**, Consiglio Nazionale delle Ricerche, Italy, **Wolfgang Scherer**, INTEVEP, Venezuela, and **Ricardo Olea**, Kansas Geological Survey, as non-voting chairman. The following slate of candidates emerged from the deliberations of the Commission. The names are listed in alphabetical order by office:

PRESIDENT

Graeme Bonham-Carter, Canada
Vera Pawlowsky-Glahn, Spain

VICE PRESIDENT

Frits Agterberg, Canada
Olivier Dubrule, France
Jaime Gómez-Hernández, Spain

SECRETARY GENERAL

Carol Gotway Crawford, USA
Cedric Griffiths, Australia
John Tipper, Germany

TREASURER

Geoffrey C. Bohling, USA
Timothy C. Coburn, USA

ORDINARY COUNCILOR

Margaret Armstrong, France
John Broome, Canada
Antonella Bucciatti, Italy
George Christakos, USA
John H. Doveton, USA
Robert Garrett, Canada
Jan Harff, Germany
Stephen Henley, UK
Thomas A. Jones, USA
Ryoichi Kouda, Japan
Maria-T. Schafmeister, Germany
Gert Weltje, The Netherlands

All individuals in the list are members of the Association and have confirmed their willingness to run.

Preparation of the slate of candidates involved close scrutiny of 48 nominees from 16 countries. Only two of the nominees selected by the Commission declined the honor to run, and one, P. J. Lee, died after being nominated (see obituary on page 19). In the selection, the Commission considered multiple factors to generate a list of meritorious candidates as balanced as possible. The Commission took care to include candidates from all of the countries with the 10 largest national memberships and it was generous with respect to representation of women. Although the proportion of female candidates is below the average world proportion, its record number on the slate is several times greater than the more relevant proportion of female members in the IAMG, which is only 5%. The slate is the largest ever, the first one without unopposed candidates, and at the same time the first one without the Secretary General running for President.

RESPONSIBILITIES OF OFFICERS AND COUNCILORS

The IAMG Council is the board of directors of the IAMG. The President, Vice President, Secretary General, and Treasurer and six **Ordinary Councilors** are all voting members of the Council. Any IAMG member, the President, or any of the Council members can bring a concern before the Council. Council members are expected to provide opinions, propose solutions, and participate in voting to select alternatives. The President, Vice President, Secretary General, and Treasurer have the following additional executive duties:

The IAMG **President** is the head of the organization and Chairman of the governing Council. S/he serves as ex officio member of some Committees and Commissions, as an ambassador to other professional organizations, as legal representative of the Association in dealing with publishers and other groups, and as a Solomonic judge to resolve conflicts when disputes become personal. A good president should foresee opportunities and difficulties, rather than react when situations have reached a crisis status.

The **Vice President** is supposed to step in as President in case of an unexpected departure of the President from office, but in practice, it is the Secretary General who is expected to replace the President in an orderly succession. The Vice President is the IAMG representative before the International Statistical Institute (ISI)--to which IAMG has been an affiliated society since its foundation. ISI meetings are held every odd year. The main responsibility of our Vice President is to organize a joint session at every ISI meetings.

The IAMG **Secretary General** is the operational officer of the Association. The main duties are to make arrangements and prepare minutes for every live meeting of Council and for every meeting of the General Assembly. Each year the Secretary General has to prepare the presentations to all IAMG award winners. The Secretary General is also the IAMG representative before the International Union of Geological Sciences (IUGS) and prepares an annual report of the main Association activities. Moreover, the Secretary General is in charge to prepare and collect ballots for amendments to the Constitution and for elections to the Council.

The **Treasurer** is the Chief financial officer of the organization and is responsible for collecting dues and publisher royalties, arranging journal subscriptions, making payments, and managing assets now standing at half a million dollars. The Treasurer has control of the membership list. Recently Council added to the responsibilities of the Treasurer the keeping of the original molds of the Krumbein medal.

Resumes of the Candidates

(in alphabetical order)

Margaret Armstrong (councillor)



After completing a master's in mathematical statistics at the University of Queensland in Australia, I came to Fontainebleau to study for a doctorate in mining geostatistics at the Centre de Géostatistique. Since then I have worked on many different types of applications: rainfall and fisheries in addition to mining. More recently my research has focussed on plurigaussian simulations. Throughout my 20 years at the Centre teaching has always been an important part of my activities, either as the director of our post-graduate programme, the CFSG, or via short courses. For the past 7 or 8 years I have also contributed actively to Imperial College's Master of Deposit Evaluation course. Last year the IAMG awarded me the John Cedric Griffiths Prize for Teaching.

Having been actively involved in geostatistics and mathematical geology, it seems appropriate to take an active role in the IAMG as a councillor.

Frederik P. "Frits" Agterberg (vice president)

I was born in 1936 in Utrecht, the Netherlands and studied geology and geophysics at the University of Utrecht obtaining MSc (1959) and PhD (1961). After a postdoctorate fellowship at the University of Wisconsin, I joined the Geological Survey of Canada, initially as petrological statistician working on the International Upper Mantle Project. Later, I helped form and headed the Geomathematics Section (1971/96) in Ottawa. I have authored or co-authored over 200 scientific papers including the textbook "Geomathematics" published in 1974 by Elsevier and the monograph "Automated Stratigraphic Correlation" (1990). In 1978, I became the third W.C. Krumbein medallist of the IAMG. Since 1968, I have been associated with the University of Ottawa, teaching statistics in geology and directing the research of graduate students. I also have lectured in more than 50 short courses worldwide. From 1979 to 1985, I was Leader of IGCP Project 148 (Quantitative Stratigraphic Correlation Techniques). I was on the committee founding the IAMG in 1968, served on the IAMG Council twice, performed various editorial functions for each of our three journals, and am currently chairing the IAMG Publications Committee. In 1996 I commenced a phased retirement from the Geological Survey of Canada where I continue to work part-time.



I am running for the office of Vice President to help the President and to coordinate collaboration with mathematical statisticians. Although originally a geologist, I have presented invited papers at ISI and ASA meetings and was adjunct research professor in the Department of Mathematics and Statistics, Carleton University, 1986-1992.

Geoffrey C. Bohling (Treasurer)

I am an Assistant Scientist in the Mathematical Geology Section of the Kansas Geological Survey, where I have worked for 11 years. I obtained a B.S. in geophysics and a B.A. in English from the University of Kansas in 1986, an



M.S. in hydrogeology from the University of Wisconsin-Madison in 1988, and a Ph.D. in hydrogeology from the University of Kansas in 1999. In my position at the KGS I have participated in a wide range of projects involving quantitative and statistical applications in the earth sciences, including aquifer characterization and groundwater modeling, well log analysis, regionalized classification, and compositional data analysis, among others. My service to the IAMG has included serving as Book Review Editor for Computers & Geosciences since 1996 (and also as Software Review Editor starting in 1999) and reviewing a number of manuscripts submitted to C&G and Mathematical Geology over the past few years. Administrative aspects of my job as C&G Book and Software Review Editor include locating books and software of interest, corresponding with reviewers and publishers, and managing a database of books, reviews, reviewers, and publishers.

In 1998, I served as treasurer of the Lawrence Bicycle Club Racing Team. Although LBCR is a much smaller organization than IAMG, serving as LBCR treasurer provided me with experience in some of the related duties: processing dues, maintaining the membership list, and, of course, managing the checkbook. I would be happy to serve as the Association's treasurer and believe I have the experience and ability to do so well.

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Candidates continued from p. 7

Graeme Bonham-Carter (*president*) was born in London, England, and received his undergraduate degree (1962) at Cambridge University and masters (1963) and doctoral (1966) degrees in geology at University of



Toronto. He spent 3 years at Stanford University as a post-doctoral fellow working with John Harbaugh, culminating in their publication of the book "Computer Simulation in Geology" (578p, Wiley-Interscience, 1970). During the early 1970s, he taught at University of Rochester, and after a period of self-employment in England joined the Geological Survey of Canada in Ottawa (1980). He is interested in a broad range of applied geomathematical research, including multivariate statistics, computer simulation modelling of sedimentary processes, wind-driven circulation models of lakes, quantitative integration of mineral exploration datasets, GIS, modelling the dispersal of metals from smelters,

geochemical data analysis. In 1994 he published "Geographic Information Systems for Geoscientists: Modelling with GIS" (398 p., Pergamon). He joined IAMG in 1970, was a former Chairman of the Education Committee, was a member of the Awards Commission, Chairman of the 1999 Brochure Commission that gave IAMG its first brochure in 9 years, and currently serves on the Publications Committee. He has served as ex-officio Councillor of IAMG since becoming Editor-in-Chief of Computers & Geosciences in 1995 (previously was an Advisory Board member, Book Review Editor and Associate Editor of C&G). He was instrumental in making computer code published in C&G publicly available from an IAMG server housed at the Geological Survey of Canada in Ottawa. He was the 1998 winner of the Krumbein Medal.

His main reason for standing as a candidate for President is his desire to serve the organization that has been an important part of his professional career. He believes that IAMG can continue to flourish, but needs to expand its membership, particularly in countries outside North America.

John Broome (*councilor*)

Education:: Graduated from Queen's University in 1975 with a B.Sc. (Engineering) Geology. In 1989 obtained an M.Sc. Geology from Carleton University in Ottawa.

Experience: Worked at Sander Geophysics Ltd. (Ottawa) from 1979-1983 collecting, compiling, and interpreting airborne geophysical data. Joined the Geological Survey of Canada in 1983 and conducted research on computerized visualization, modelling, and interpretation of potential field and other geophysical data. Results of this research included the first software for interactive illumination control for shaded-relief imagery and a ternary mapping algorithm and software that is widely used for display of gamma-ray spectrometry data. In the mid-1980s a suite of public-domain software was published for modelling (MAGRAV2) and visualization of potential fields data which was widely used in North America and 30 other countries.



Since 1994 John Broome has been Head of the Geoscience Integration Section at the Geological Survey of Canada. The Geoscience Integration Section is involved in development and application of digital data management and analysis techniques for NATMAP, Lithoprobe, and other Canadian geoscience projects. In 1996 he was chairman of the GIS Division of the Geological Association of Canada.

In recent years, John Broome had been a leader in the process of developing standards and methodology to improve access to Canadian geoscience data managed by federal and provincial agencies. These activities have included a GAC workshop on geoscience data standards in May 1997, and the development of a Canadian Geoscience Publications Directory which provides Internet access to metadata distributed among participating Canadian geoscience agencies.

Publications: 43 papers in special publications and refereed international journals; 6 Geological Survey of Canada Open File publications; 104 published abstracts for oral and poster presentations

Antonella Buccianti (*councilor*) was born in Florence, Italy, in 1960 and completed the Degree in Geological Sciences in 1988 at the University of Florence followed in 1994 by the Ph.D. in Mineralogy and Petrology. In 1996 she won a two-year post-doctoral grant of the University of Florence, and during 1998 she received a one-year NATO-CNR grant to work at the Department of Applied Mathematics III of the Polytechnic University of Barcelona (Spain). Since May 1999 she is working under a research contract at the Department of Earth Sciences, University of Florence.

Since 1988 the scientific activity of Antonella Buccianti has been focussed on the application of univariate and multivariate statistical methodologies

to analyze geochemical and petrological data (compositional data analysis and geochemical modelling).

In 1994 Buccianti became a member of IAMG and Italian representative member in the Membership Committee. Since November 1998 she has been a member of the Editorial Advisory Board of Computers & Geosciences and since September 1999 member of the IAMG Student Grant Commission. In 1998 she organised the fourth IAMG Conference held in Ischia (Italy).

Buccianti wants to serve IAMG in order to continue to promote the mathematical and statistical culture in the geological community



George Christakos (*councilor*) is Professor and Director of the *Environmental Modelling Program* and of the *Center for the Advanced Study of the Environment* at the University of North Carolina-Chapel Hill.

Dr. Christakos received a Ph.D. in Applied Sciences (Harvard Univ.); PhD in Mining & Metallurgical Engin. (Nat. Tech. Univ.-Greece); M.S. in Civil & Environmental Engin. (M.I.T.); and MSc in Soil Mechanics (Birmingham Univ., U.K.). He is the recipient of several awards, including the Lukacs award and IAMG President's prize. He is author/co-author of 5 books and over 70 research papers in scientific journals/refereed volumes. Current research projects include exposure analysis, health risk assessment, temporal GIS, modelling of flow and transport, air pollution control, and environmental epidemiology. Support provided by NIEHS, ARO, DOE and DOD.



Dr. Christakos serves on review panels and advisory committees of government agencies and international research institutes. He is the Editor-in-Chief of the journal of "Stochastic Environmental Research & Risk Assessment" (Springer-Verlag), and serves on the Editorial Boards of "Environmental and Ecological Statistics", and "Advances in Water Resources". Dr. Christakos has taught short courses in USA and overseas, some of them organized by IAMG. He is referee for "Mathematical Geology" and has recently completed a book for the IAMG series of monographs. His goal is to contribute to the further development of IAMG into the next millennium, working to attract and retain top researchers in the field and transfer knowledge from research laboratories to industry. He will encourage the development and dissemination of new quantitative methods to the IAMG community, and expand IAMG's scope to create new opportunities in related fields. He believes that in this era of increasing emphasis on interdisciplinary scientific efforts, the IAMG can benefit from collaborations with researchers in other fields and from the transfer of expertise and ideas across fields.

Tim Coburn (*treasurer*) is Associate Professor of Statistics in the Department of Mathematics and Computer Science at Abilene Christian University

in Abilene, TX, and also serves as University Statistician. In the summer of 1999, Dr. Coburn was Visiting Research Scientist in the Mathematical Geology Section of the Kansas Geological Survey. Coburn received his M.S. and Ph.D. degrees in Statistics in 1975 and 1980, respectively, from Oklahoma State University, having completed undergraduate training in math and physics at Abilene Christian in 1973. He was employed by Phillips Petroleum Company, and served as a consulting statistician and in various other capacities at Phillips Research Center in Bartlesville, OK from 1980 to 1985. He played an integral part in the Prudhoe Bay equity arbitration proceedings on behalf of the Mobil/Phillips/Chevron consortium. From 1985 to 94, Coburn served as consulting and research statistician for all of Marathon's worldwide petroleum exploration activities and as Supervisor of Quantitative Geosciences in Littleton, CO, and since 1994 as Supervisor of Mapping and Database in the Exploration Services Division in Houston, TX. In both supervisory positions, Dr. Coburn managed multimillion dollar programs in research and development, technology deployment, and technical services. From 1995 - 1997 Dr. Coburn served as Senior Statistician, and as Project Manager and Team Leader for fuel and energy analysis at the National Renewable Energy Laboratory in Golden, CO. Dr. Coburn has long been active on the Energy Statistics Committee of U.S. Energy Information Administration and the American Statistical Association, on the Publications and Geological Computing committees of AAPG, and as a peer reviewer in the area of quantitative geosciences. He is the author of many journal articles and technical reports. He currently serves on the advisory board of Natural Resources Research, and is co-editor of the forthcoming text "Geographic Information Systems in Petroleum Exploration and Development".



John H. Doveton (councilor)

I received my MA degree from Oxford and PhD from Edinburgh University, both in geology. Following work as an exploration geologist for Mobil Oil Canada, I have been a research associate at the Kansas Geological Survey and Adjunct Professor in Geology at Kansas University. My major research areas are computer applications to geology and petrophysics. My service to the IAMG has been as a member of the Nominating Committee (1975, 1980, 1988), the Krumbein Medalist Selection Committee (1986), the Membership Committee (1990), the Grants Commission (1998), as well as Assistant Editor for *Computers & Geosciences* (1981- 98) and *Mathematical Geology* (from 1995). I was awarded the IAMG 1996 Griffiths Teaching Award. I have also been a Distinguished Speaker for the SPWLA and an Associate Editor for the AAPG.



My reasons for running for the office of councilor are that I perceive that the IAMG must reach out to a new generation of mathematical geologists in innovative ways. The IAMG is unusual among scientific societies in that rather than fighting for financial survival it is relatively rich in resources,

but has a small membership base. Hopefully, a prudent investment of planning and resources into some new areas will broaden our membership. A simple increase in the number of members is not the main priority, but an expansion of membership into related disciplines, so that mathematical geology fulfills its broad vision.

Olivier Dubrule (vice president) is currently Manager of the «Shared Technologies for Geosciences» network within Elf Exploration Production in Pau, France. His network is in charge of the development of 3D Earth Modelling, Geostatistics and Uncertainty Evaluation techniques within Elf EP.

In 1981 Olivier obtained a Docteur-Ingenieur Degree in Petroleum Geostatistics, under Prof Matheron's supervision at Ecole des Mines in Fontainebleau, France. He then worked four years for Sohio in the US and five years for Shell International in Holland. After joining Elf in 1991 he spent three years in Pau, four years in London, then took his current position in Pau in 1998.

Olivier has been an IAMG council member since 1997. He is also in charge of membership Development in the industry. In 1989 Olivier received the President's Prize of the IAMG. In the last 20 years he has also been a regular reviewer for *Mathematical Geology*.

Olivier is 43 years old, is married to Anne, and they have four children aged between 8 and 18.

If elected vice-president, Olivier would like to encourage more cooperation between IAMG and the industry, and develop the presence of the Association in Europe. Olivier believes that the current developments of geostatistical and 3D earth modelling techniques in the petroleum industry and elsewhere are a wonderful opportunity for the IAMG to develop its membership and its services to geomathematicians around the world.



Robert G. (Bob) Garrett (councilor) studied Mining Geology and Applied Geochemistry at Imperial College, London. During his graduate work in 1964 he first used quantitative methods and computers to assist in interpreting geochemical data. After a postdoctoral fellowship with Tim Whitten at Northwestern University, where he also enjoyed the Bill Krumbein experience, he joined the Geological Survey of Canada in 1967. Throughout his career he has used quantitative and statistical methods to support studies concerning survey design and evaluation, and data interpretation. Several contributions in the areas of unbalanced analysis of variance, outlier recognition, and multivariate data analysis have stood the test of time. He has contributed to IGCP projects 98, 259 and 360, bringing to them his expertise of quantitative methods and geochemical data. His most recent research has employed non-linear modelling to study the links between soil geochemistry and the uptake of cadmium by agricultural crops. He has published extensively, including 'popular' articles to encourage geochemists to use rather than abuse quantitative methods in their work, and has delivered short courses to promote that objective. He is currently Coordinator of the GSC's Metals in the Environment Initiative that undertakes geochemical research to support Canadian regulatory and national and international policy, activities concerning risk assessment and risk management for metals. He

served on the Council and Executive of the Association of Exploration Geochemistry from 1976 to 1987, was Secretary from 1979 to 1982, and President in 1984-85; and continues to serve on a number of committees. He has been a member and supporter of the IAMG since its establishment in 1969, and would like to contribute to its objectives and success in a more formal way.



Jaime Gómez-Hernández (vice president) has a Civil Engineering Degree with Highest Honors from the Technical University of Valencia, an MSc. in Applied Hydrogeology and a Ph.D. in Geostatistics, both from Stanford University. He is Professor of Hydrogeology at the Technical University of Valencia, currently on sabbatical as a Visiting Professor in the Department of Geological and Environmental Sciences at Stanford University. His research interests are in stochastic hydrogeology, geostatistics, deep underground disposal of nuclear wastes and integration of production data for reservoir characterization. He has published more than 25 papers in peer-reviewed papers in these areas.



His services to IAMG and to the scientific community at large include being guest editor of special issues for *Mathematical Geology* and *Journal of Hydrology*, member of the IAMG Lecture Series Commission, Secretary of Hydrogeology for the European Geophysical Society from 1994 to 1996, Associate Editor for both, *Advances in Water Resources* and *Journal of Hydrology*, member of the Board of Editors of Oxford University Press for its series on Applied Geostatistics and reviewer for a number of journals such as *Mathematical Geology*, *Journal of Contaminant Hydrology*, *Computers and Geoscience*, and others.

He was awarded the National Prize for Best Civil Engineering Graduate (Spanish Ministry of Education, 1983), the School of Earth Sciences Outstanding Teaching Award and Centennial Teaching Assistant Award (Stanford University, 1990), the Editor's Citation for Excellence on Refereeing (American Geophysical Union, 1993) and the Valencian Community Prize for Research on Waste Disposal (1999)

As Vice President he plans to work closely with the President to promote mathematical geology among earth scientists, particularly for subsurface flow modeling. Flow modeling is a topic encompassing many earth science disciplines and increasingly mathematical geology, as witnessed by the growing number of related papers published in *Math. Geology*. He will ensure that the ties with the International Statistical Institute are maintained through the customary organization of a joint session during the biannual ISI meetings.

Carol A. Gotway Crawford (Secretary General) is at present Mathematical Statistician, National Center for Environmental Health, Centers for Disease Control and Prevention, Atlanta GA, USA

University degrees: B.S. Geology, B.S. Mathematics, Bradley University; M.S. and Ph.D. Statistics, Iowa State University.

Areas of professional interest: Statistical applications in geology and the environmental sciences; spatial statistics; risk analysis and stochastic simulation.

Administrative experience: Vice President of IAMG 1996-2000; American Statistical Association (ASA)'s Committee on Energy Statistics, 1996-2000, chair 2000-2003; Secretary, ASA's Section on Statistics and the Environment (ENVR), 1996; Treasurer, ASA/ENVR, 1995.

Service to the Association and the profession: Vice President of IAMG, 1996-2000; IAMG membership committee, USA representative, 1999-2000; Reviewer for *Mathematical Geology* and *Computers and Geosciences*, 1992-present; Member of interdisciplinary expert panel on estimating pesticide concentrations in drinking water for the U.S.

Environmental Protection Agency, 1998-present.

Honors: ASA/ENVR Distinguished Achievement Award, 1999; Who's Who in Science and Engineering, 1998; American Society for Quality Control's Jack Youden Prize, for the best expository paper in 1994; Technometrics, 1995; Sigma Xi, The Scientific Research Society, 1994; Sandia Award for Excellence for contributions to the bin-scale gas generation test program, WIPP nuclear waste repository, New Mexico, 1991; Mu Sigma Rho, National Statistics Honorary Society, 1986.

I am running for Secretary General of the IAMG in order to increase collaborative opportunities between geologists and mathematicians and to promote IAMG among mathematicians and mathematical societies. As IAMG Vice President, I have begun working toward this goal by providing opportunities for IAMG members to showcase their work at statistical meetings. As Secretary General, I would like to create more opportunities for geologists to apply mathematics and for mathematicians to become interested in mathematical geology. I believe such increased collaboration will benefit both groups, and make IAMG a stronger association.

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The 1999 annual IAMG conference was held at the Radisson Royal Garden Hotel, Trondheim, Norway, August 6-11. The organization was handled by the local committee of **Richard Sinding-Larsen**, **Arve Naess**, and **Stephen Lippard**. Besides IAMG, the conference was sponsored by Statoil, The Norwegian University of Science and Technology, and The Commission on Fossil Fuels of IUGS.

The event closely followed the traditional format of IAMG conferences, including two days of workshops, a one-day excursion, three days of sessions and posters, a banquet and an award ceremony. New features included lunch at the hotel during the three days of technical sessions, and selection of a *Best Poster* by a Committee of conveners. The winner was **Bernd Boberts**, from the Baltic Sea Research Institute, Germany, with his presentation "Analysis of Granulometric Data from the Bottom of the Baltic." Sponsorship by Statoil made the conference the most industry-oriented of all IAMG conferences.

Tapir publishing house sells the hard bound proceedings in two volumes with a total of 784 pages, containing three keynote papers and 115 extended abstracts up to 6 pages in length.



Richard Sinding-Larsen, Ricardo Olea, Arve Naess



The Awards Session: Mike Hohn, Vera Pawlowsky, Ricardo Olea, Carol Gotway-Crawford



THE AWARDWINNERS:
Hugh Rollinson
Margaret Armstrong
Graeme Bonham-Carter
Pierre Goovaerts
(l. to r.)



Jan Harff and John Davis



Secretary gen'l Tom Jones presenting the Chayes Prize to Hugh Rollinson



Graeme Bonham-Carter



André Journel



Chairman Richard Sinding-Larsen



John Davis

IAMG'99 in Trondheim



President Ricardo Olea



Entertainment at banquet



Ute Herzfeld and Helmut Mayer with Almut



Reception in Lobby at the Conference Center of the Royal Garden Hotel

Photo Credits:
G. Bonham-Carter,
Stephen Lippard,
Niichi Nishiwaki

Stanford's Geomath Program (part II)

by John W. Harbaugh

This is a condensation of a detailed history that John Harbaugh has compiled recalling the growth and life of the geomathematics curriculum at his Department at Stanford University, and showing the interaction with and influence on the "outside" world. John has shortened it so that we can bring it to you in two installments. The first part was published in Newsletter No.58. Ed.

In the spring of 1980, an interesting challenge arose. John Sweet of ARCO Exploration Company asked if I would investigate uses of computers by ARCO's explorationists and make recommendations for changes to stimulate their use. I agreed and invited John Davis to join me. John and I met repeatedly with ARCO's geologists and computer professionals in Dallas and Anchorage.

We were surprised at what we found. ARCO was bogged down in trying to create a "do-all" centralized computing system that would provide all aspects of computing and data-handling services for the company's exploration and production groups. It would serve landmen, geologists, geophysicists, and engineers, and would be centralized with mainframes located in Dallas that would be linked with satellite computers throughout the company. It was a grand concept, but ahead of its time. In today's Internet era it might work well, but at that time it was too ponderous and too dependent on transmission of information to and from the central facilities and the satellites. Eventually ARCO abandoned the project. The connection with ARCO proved to be valuable because it resulted in gifts of computer hardware to the Geomath program. The most important was a surplus "Megaseis" computing system designed for seismic processing, but which in reality was a general-purpose "mini" computer. It arrived at Stanford in late 1983 and was operated by the Geomath program around the clock for two years. The Megaseis machine had been manufactured by a company that was purchased by the Gould Company as their entrée into the computing business. When the machine arrived, I contacted the Gould Company for maintenance, who agreed to provide maintenance at no cost to us. We were in luck. As connections go, the Gould connection proved to be a good one. A year after the Megaseis machine arrived, Gould asked if we would like to have a new Gould mainframe - the top of the line at that time. Of course we said yes, and I generated the rationale for our use of such a machine. The machine arrived in December 1985, with a total list price of about a million dollars.

We sold the Megaseis machine after the Gould mainframe was operating, and used the big Gould continuously for four years. By late 1989, however, desktop graphics workstations were on the scene that had more power and were vastly cheaper to maintain. We sold the big Gould and moved our work to an Ardent graphics workstation. Shortly afterwards, the Loma Prieta earthquake of October 18, 1989 racked our quarters in Geology Corner so badly that the building had to be vacated. The Geomath operation was shut down until we could move to temporary quarters, and we weren't able to return to our old quarters for six years.

In 1980, I received inquiries as to whether the Geomath program would accept several visiting scholars from China, who would be sent for two years with all expenses paid by the Chinese government. I agreed, and 1981 three arrived, namely Juli Qin, Cunshan Lin, and Cheng Lu (with family names here listed last). The three formed a congenial and hard-working group. Cunshan Lin's work was particularly innovative and led to a book on Markov chains for representing spatial relationships in two and three dimensions, with example applications for analyzing and displaying fabrics of granites and gneisses.

In 1985, I was notified that I would receive the IAMG's highest award, the William Christian Krumbein Medal, which had been established initially in 1973 and awarded annually since. I was enormously pleased. The medal was presented at the AAPG's annual meeting in Atlanta, Georgia in March 1986. Dan Merriam made the presentation, which included a cleverly organized slide show that touched on many of the geomathematical activities that he and I had been involved in over the years. I think most in the audience enjoyed the show, and of course I did.

A major step forward for the Geomath program began when Dan Tetzlaff arrived from Argentina in 1980. Dan began a PhD dissertation in a new project centered on simulating transport and deposition of clastic sediment. He had been attracted by the early simulation schemes in the book that Graeme Bonham-Carter and I published in 1970. The new simulation procedures, however, would be vastly improved and would much more closely represent fundamental processes of fluid flow and

sediment transport, and well as being three-dimensional.

These were bold steps, but Dan proved adroit at devising computational schemes for newly representing flow with finite fluid elements that interacted with each other. The volume of arithmetic was large, but after the Megaseis computer arrived we had enough computing power to carry out much of the early work, and later we benefitted from the much greater power of the big Gould machine. On the other hand, we never had enough power to do truly large experiments. We could readily devise experiments that could consume all the arithmetic cycles that any machine could provide. Still, the results were impressive, for little along these lines had been seen before.

We named the project the "SEDSIM" (SEDimentary Basin SIMulation) project. It was guided by a grand scheme that would embrace most of the important processes that create sedimentary basins. There were a number of other early workers on the project, including Younghoon Lee who maintained SEDSIM's code and performed many experiments, Colleen Shannon who simulated crustal motions at passive continental margins, Toby Scott who simulated deposition of the Ivishak reservoir beds at Prudhoe Bay, Robert Laudati who developed an early oil-migration simulator, and Zhiming Lu, who developed a beginning turbidity flow simulation model. The first book describing the SEDSIM project was published in 1989 by Dan Tetzlaff and me, and entitled "Simulating Clastic Sedimentation."

Money for the SEDSIM project was easy to obtain. In 1981, I described our aspirations to Texaco, which immediately provided \$50,000 to get the SEDSIM project underway. The early 1980s were boom times in the oil industry and Texaco came through again and again. By 1985 we enlisted other oil companies as SEDSIM sponsors. This proved to be easy, although obtaining their sustained support was more of a challenge. Collectively, we received more than one and a quarter million dollars from a group of companies that included Texaco, Phillips, Amoco, Conoco, Sohio, Shell, ARCO, Mobil, Statoil, Elf Aquitaine, Japan National Oil Company, and Agip, as well as material support from Silicon Graphics and Dynamic Graphics in the form of workstation hardware and software. Fortunately, these funds were not subject to an institutional "overhead" charge, which allowed us to spend all the money that we received.

SEDSIM attracted students and post-doctorals. Christoph Ramshorn spent two years as a graphics programmer, Dominik Ulmer focused on subsidence in response to crustal loading, Paul Martinez developed module "WAVE" to represent wave transport, Johannes Wendebourg developed "MIGRAT" to represent oil migration and entrapment in clastic sequences generated by SEDSIM, and Shao Chin refined the procedures by which flow and sediment transport can be represented by SEDSIM. Two other books emerged from the project. Paul Martinez and I published "Simulating Nearshore Environments" in 1993, and Johannes and I published "Simulating Oil Entrapment in Clastic Sequences" in 1997.

SEDSIM's original concept of simulating the actual processes that transport and deposit clastic sediment was a good one and has guided the project throughout its history. At the outset we thought that it might take four or five years to develop a more or less fully functional sedimentary basin simulation system. In hindsight we grossly underestimated the effort involved, and still haven't reached our goal. On the other hand, we've had few precedents to guide us, but the prospect of a fully functioning system for simulating sedimentary basins is still before us, and I think ultimately attainable.

The Geomath program, including the SEDSIM project, has been blessed with a succession of visitors. These include Rudy Slingerland of Penn State University in the fall of 1989, at which time we outlined plans for the book coauthored by Rudy, Kevin Furlong, and me that was published in 1993 and entitled "Simulating Clastic Sedimentary Basins: Physical Principles and Computer Programs for Creating Dynamic Systems." Other visitors included Michael Alvers, a student at the Free University of Berlin who worked on SEDSIM's flow procedures, Jean-Marie Stam who worked on eolian transport processes (work that became her PhD dissertation at Delft Technical University), Herbert Klein of Freiburg University, Cedric Griffiths who has applied SEDSIM in a succession of real-world oil-exploration contexts, Kevin Tuttle who adapted SEDSIM to represent deposition of an ice-front delta in a late Pleistocene lake in southern Norway, Hans Kupfersberger who simulated fluvial deposits in a river in Austria, and Sabine Schmidt and Hans-Juergen Goetze who developed software for representing crustal transects on PC computers.

Meanwhile, risk analysis remained an important part of the Geomath program. Phil Kushner devised formalized procedures for using drill-stem test information for making decisions in completing oil wells, and Francisco Rocha devised a scheme for optimizing sequences of wells in exploitation drilling. Additionally, John Davis, Johannes Wendebourg, and I taught industrial short courses and transformed the shortcourse manual into a 1995 book entitled "Computing Risk for Oil Prospects: Principles and Programs." Earlier, Marathon Oil Company had engaged us to teach several shortcourses, and provided funds to transform our risk procedures to fully computerized form. Jo Anne DeGraffenreid of the Kansas Survey

Member News

edited and composited successive revisions of the shortcourse manual, as well as editing and compositing the typescript of the book.

During the 1994-95 academic year, I served as the Keck Professor of Exploration Science at the Colorado School of Mines. I arrived at Mines unfettered by research commitments, so the slate was clean to start something new. Previously I'd given some thought to working on fully coupled dynamic systems in which all components are mutually interdependent. In preparing the 1970 simulation book, Graeme Bonham-Carter and I had been impressed with the complex behavior of simple coupled systems (such as the "geology student model" in the book) in which cyclic and chaotic responses are almost always present and are difficult or impossible to predict. Later, the unpredictability of SEDSIM's performance when considered in detail, strengthened my ideas on the inevitability of cyclic and chaotic behavior in coupled systems. At Mines I worked with Brian Penn, who had just received his PhD. Interestingly, Brian had also developed an interest in chaotic behavior, and he and I decided to focus our research on the behavior of coupled dynamic systems.

With considerable uncertainty as to how to proceed, Brian and I devised a theoretical dynamic simulation model called "DYNASED" that represents interactions between three "state" variables which are (1) variations in the overall elevation of the continents, (2) variations in sealevel, and (3) variations in the rate at which sediment eroded from the continents is transferred to the ocean. Viewed in the abstract, DYNASED thus incorporates the most basic aspects of the rock cycle, namely uplift of the continents, denudation by erosion, accumulation of sediment in the ocean, and transfer of material in the mantle and deep crust as a control system that keeps accounts in balance.

DYNASED does all this with the three state variables, which are incorporated in three equations that are solved numerically through thousands or millions of successive iterations. DYNASED's behavior has surprised us. By adjusting DYNASED's parameters, its behavior can be made to exhibit varying degrees of chaos and cyclicity, although cyclicity and a degree of chaos are always present. Stability can never be attained no matter how many iterations are run. But, our quest has not been a search for stability, but instead has been to explore parametric settings that might parallel those of the real world. This is a tall order. DYNASED's properties are regulated by 17 parameters that include seven coefficients, seven exponents, and three lag intervals. Devising procedures to explore this 17-dimensional parameter space is a huge problem. The plan is to continue the work for the next several years, although we're unsure where it will lead.

In retrospect, the 38 year history of the Geomath program has included many opportunities and surprises. I never dreamed that it would turn out as it has. Looking back to the 1960s, it is clear that we were very early in the world of computing. In fact, we were still early until the middle 1970s. By the late 1970s, however, the computing world had expanded drastically and many people were involved in computing in the earth sciences. Coincidentally, the late 1970s witnessed the rise of the personal computer that was to change things forever. By that time we were no longer among a hardy band of "computer types" and our "guru" status had waned.

In hindsight, we focused on some major geomathematical topics relatively early, such as process simulation. As recounted, our 1970 tome on simulation was too early and largely went unnoticed. One mistake is that we failed to provide convincing applications of the usefulness of simulation. We naively assumed that geologists would soon appreciate its power, but they didn't, and for that matter still don't. Regardless of all these changes, we've been blessed with exceptionally talented and dedicated students, visitors, and post-doctorals, and enthusiastic supporters in industry and other academic institutions. Without them there never would have been a Geomath program. So what lies ahead? It's hard to say, but among other things, there may be some revelations in exploring fully coupled systems. The big problem is that it is difficult to devise equations for representing coupled systems, and even more difficult to calibrate parameters that control them. Still, we geologists have always given credence to the rock cycle as a fully coupled system, so its simplified representation may provide wide-open opportunities for those geomathematical adventurers brash enough to try.

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What's he doing now? When asked **John Harbaugh** replied:

"I'm now emeritus at Stanford, but still working. A principal activity for the next couple of years will be to write a book-length history of the earth sciences at Stanford - which began nearly 110 years ago. This fall, I'm working with Dan Merriam of the Kansas Geological Survey on high-level chert gravels in eastern Kansas. In geomathematical research, when back at Stanford later this fall, I will be returning to earlier work on cyclic and chaotic behaviour of fully coupled dynamic systems."

John C. Davis, head of the Kansas Survey's Mathematical Geology Section, will be presented the Wilhelm Ritter von Haidinger Medal by the Geologische Bundesanstalt (the Geological Survey of Austria). The medal is named for the founder of the Imperial Geological Institute, forerunner of the modern Austrian Geological Survey. It is among the highest civilian awards given by the Austrian government.

Davis will be the first American to receive the Haidinger medal. He was selected for the award based on his applications of mathematical and statistical techniques to geological problems, particularly the mapping of chemical elements in the environment. Davis has studied environmental problems in Austria and worked as a Senior Fulbright Scholar in Austria in 1994. Davis's research group at the Kansas Survey developed the computer mapping software used by the Austrians in geochemical studies.

The Haidinger Medal was first presented in 1856 to W.R. von Haidinger in recognition of his service in promoting the natural sciences in Austria. The original mold for the Haidinger award was the only survivor in the Austrian Survey's collection of medals following World War II. The medal was revived as a modern award during the Austrian Survey's Centennial in 1951. Since then, 11 medals have been presented in recognition of distinguished contributions to applied geology.

The award will be presented in November at Rasumofsky Palace in Vienna, headquarters of the Austrian Survey, during their 150th anniversary celebration.

Dr. **Allan L. Gutjahr**, professor of mathematics and research mathematician at New Mexico Tech, Socorro, New Mexico, has been named a Fellow of the American Geophysical Union (AGU). No more than 0.1 percent of the membership are eligible for nomination to fellowship in any given year. He was cited for fundamental contributions in the application of statistical methods to subsurface hydrology and diverse collaborations on applications of geostatistics to geophysical problems. New Fellows were honored in a ceremony and banquet at the AGU Spring conference in Boston on June 2, 1999.

Professor Gutjahr also received the 1999 Distinguished Research Award of New Mexico Tech at the May 15 commencement. In 1987 he received the Distinguished Teaching Award at New Mexico Tech and is the only faculty member at Tech who has received both these awards. Professor Gutjahr received his Ph.D. in Statistics at Rutgers in 1970 and has been at New Mexico Tech since 1971. He was chairman of the Mathematics Department for three years and served for two-and-a-half years as Associate Vice President for Academic Affairs and for six years as Vice President for Research.



Carol Gotway Crawford, senior mathematical statistician with EHHE, was awarded the Distinguished Achievement Medal by the American Statistical Association's Section for Statistics and the Environment at the Joint Statistical Meetings this summer. This is a high honor for Carol that recognizes her contributions to the field of environmental statistics and also brings recognition for the quality of work done by statisticians at NCEH.

Hernani Chaves awarded Professional Merit Medal

By Brazilian laws, all professions officially recognized, with specific regulations and duties (medical, engineering, geology) have a national Council to assure that norms and policies are correctly applied (a certification organization). In spite of the Councils being official organizations, their members are elected from the members of the profession. CONFEA (Conselho Federal de Engenharia, Arquitetura e Agronomia) has its headquarter in Brasilia, DF, and CREA-RJ (Conselho Regional do Rio de Janeiro) is responsible to oversee professions related to Engineering, Architecture, Geology, Geography Meteorology and Agronomy in the State of Rio de Janeiro.



Last December CREA-RJ honored Prof. **Hernani A.F. Chaves**, IAMG special IGC Councilor, the only geologist among 38 professionals, with the Medalha e Diploma de Mérito Profissional (Medal and Diploma of Professional Merit). Later, in May this year, the CONFEA commended Hernani again, the only geologist among 12 professionals in the entire country, with the Merit Medal for distinguished services rendered to the profession.

Cedric Griffiths (*secretary general*) received an honours degree in Geology from Durham University, England, in 1972 and a PhD from the University of Newcastle-upon-Tyne, England, in 1983. After a brief spell with deBeers in Angola in 1972 he spent two years with Exploration Logging, mostly in the North Sea and on one of the first computerised logging units. From 1975 to 1979 he spent six months at a time in the Kafue National Park while regional mapping for the Zambian Geological survey. After completing a PhD in 1983, in which he developed a fuzzy-set pattern recognition system for the identification of petrophysical units from drilling data, he then moved to Norway and worked with the Norwegian Continental Shelf Institute (IKU) on geological application of wireline logs and quantitative stratigraphy. From 1988 to 1991 he was Nordic Council Research Professor at the Norwegian Institute of Technology (NTH), and from 1991 to 1993 he worked for BP at the BP/Statoil Research Centre in



Trondheim. In 1993 he helped start Stratigraphic Research International AS. In 1994 he was appointed to the State Chair in Petroleum Geology at the NCPGG, Adelaide, South Australia, where he was Acting Director from 1996 through 1997. The five year contract with the University of Adelaide ended in October 1999 and he is currently working as an independent consultant based in Adelaide. He has been Secretary of the (ICS) International Committee on Quantitative Stratigraphy, author and co-author of numerous papers, and co-edited Geological Application of Wireline Logs II. Cedric is a Council member of the International Association of Mathematical Geologists, and member of several geological societies around the world. Cedric's current research interest is in predictive modelling of stratigraphic units from reservoir to basin scale using a variety of approaches including process modelling.

Jan Harff (*councilor*) - Born 1943 in Güstrow, Mecklenburg, Germany. Studied Geology at the Universities of Berlin and Greifswald 1964 to 1969. Diploma-thesis on geochemical facies analysis of Upper Carboniferous sediments from exploration wells in Northeast Germany. Dr. rer. nat. from the University of Greifswald in 1974. Scientific work in mathematical geology with the application of multivariate statistical methods to the interpretation of wire line log data for oil exploration. Between 1974 and 1977 application of geoinformatics and mathgeology to Quaternary geology as government geologist in Rostock, northeast Germany. 1977 computerized basin analysis for the exploration of hydrocarbons on the North German-Polish Depression in the Zentralinstitut für Physik der Erde (ZIPE), Academy of Sciences of the DDR, Berlin and Potsdam. Head of the department of Mathematical Geology until 1992. Doctor of Geological Sciences (Dr. sc. nat.) granted by the Academy of Sciences in 1986. Since 1992 head of the Marine Geology Section at the Baltic Sea Research Institute, Warnemünde, Germany. In 1993 appointment as Professor at the University of Greifswald, teaching courses in Marine Geology and Modeling and Geoinformatics. Visiting Research Scientist at the Laboratories of Mathematical Geology of A. B. Vistelius, Leningrad, and D. A. Rodionov, Moskau, in 1985, and at the Mathematical Geology Section of J. C. Davis in Lawrence, Kansas, in 1989, 1991, 1992, 1994, 1998 and 1999. Guest Lecturer at the Institute of Mathematical Geology, University of Geosciences Wuhan, China in 1999.



Fields of scientific interests: mathematical geology, marine geology, sedimentology, basin analysis, geoinformatics, multivariate geostatistics, modeling of sediment transport. Awards: A. G. Werner Medal and F. Stammberger Prize (1989) of the Gesellschaft für Geologische Wissenschaften (GGW), William Christian Krumbain Medal of the IAMG in 1998. Coordinator of the COGEO DATA Regional Group for Eastern Europe from 1985 to 1992. Chairman of the IAMG Membership Committee since 1992.



Stephen Henley (*councilor*) - PhD (1970) and BSc (1967) Nottingham, MIMM, FGS, CEng; Managing director, Resources Computing International Ltd.

Co-founder of Datamine mining software group, and chairman 1981-93. Since 1993, an independent consultant with particular interests in the Internet (including management of an extensive web site for The Mining Journal Ltd), in resource/reserve estimation, and in database management systems. Closely involved from 1995 (in Australia and as an overseas collaborator) with CSIRO crustal geodynamics 'predictive exploration' projects. From 1990

onwards worked extensively in the former Soviet Union, involved in technology exchange with, and provision of assistance to, Russian and central Asian colleagues. At present assisting the Institute for Mathematical Geology (IMAG) at St.Petersburg in their preparation of a set of papers intended for publication by IAMG.

A Charter Member of IAMG (joined 1969). Currently serving IAMG as Councillor (1996- 2000) and as a member of the editorial board of Computers & Geosciences. Active also in the Institution of Mining & Metallurgy (Council 1997-8; Library & Information Services Committee 1997- ; Serial Publications Committee 1999- ; Nottinghamshire Branch Council 1998-). Recipient of IAMG President's Prize 1980, and the Geological Society of London, Aberconway Medal 1992. Seeking re-election to continue service to the IAMG, especially in fostering relations with professionals in the former Soviet Union, as well as more general promotion of IAMG membership within the mining and mineral exploration industries.

Thomas A. Jones (*councilor*)

Employment: 1969 - present Exxon Production Research Company, Houston, Texas, Research Advisor. Developed concepts and methods for effectively generating contour maps with the computer, including incorporation of geologic interpretation and knowledge (especially stratigraphic and sequence-related). Developed first cellular 3-D modeling system in the petroleum industry that accurately uses stratigraphic relations and correlations in the modeling process.

Areas of professional interest: Reservoir characterization; Development of software for geologic modeling and solving geologic problems. Statistical applications.

Education: 1964 B.S. Mathematics (Statistics option) and 1967 M.S. Mathematical Statistics, Colorado State University; 1968 M.S. Northwestern University, Geology; 1969 Ph.D. Geology, Northwestern University



International Association for Mathematical Geology:

- 1969 - Charter Member
- 1976 - 80 Associate Editor, Mathematical Geology
- 1980 - 84 Editor-in-Chief, Mathematical Geology
- 1982 - 94 Book Review Editor, Mathematical Geology
- 1984 - 98 Editor, Monograph Series
- 1978 - 87 Secretary, Mathematical Geologists of the United States
- 1991 - 92 President's Prize Committee
- 1994 - Committee on Education
- 1996 - 2000 Secretary General, IAMG
- 1997 - Commission on Awards
- 1999 - Commissions on Meeting Grants (Chair) and Lecture Series

Publications: Co-author of book: "Contouring geologic surfaces with the computer"; Co-editor of book: "Computer modeling of geologic surfaces and volumes"; 50 technical papers; 35 non-refereed publications and reviews

Reasons for running: The use of quantitative methods is becoming increasingly important and necessary in the earth sciences, and I feel that well-selected IAMG initiatives can increase the use of such methods. The IAMG can be a powerful influence for showing the utility of mathematics, statistics, and computer methods for solving geological problems. As a member of Council I will support efforts to continue the growth of quantitative geology that is now derived from IAMG's publications and Annual Meetings, and I feel that added initiatives of the Education Committee and a Lecture Series will expose geologists to new mathematical techniques.

Ryoichi Kouda (*councilor*)

Bachelor of Science in Geology, The University of Tokyo, 1975 Master of Science in Geology, The University of Tokyo, 1977 Geological Survey of Japan, Research Scientist, 1977-1989 Research Scientist, Division of Ore Genesis, 1977-1989

Ministry of International Trade and Industry, 1989-1991 Exploration Expert, Mining Division, 1989-1991

Geological Survey of Japan (again), Research Scientist, 1991-present Research Scientist, Division of Ore Genesis, 1991-1992

Research Scientist, Office of International Geology, 1992-1995

Research Scientist, Division of Remote Sensing Geology, 1996-1999

Presently, Chief of Division of Information Administration and Disclosure of Geological Survey of Japan

Presently: councils of Japan Society of Geoinformatics and Institute of Geosphere Assessment; some chairs of government



committees for science and technology

He has worked to organize five ISMEs with IAMG members since 1990; next will be held in conjunction with 31st IGC. He received Best Paper Medal in 1980 of The Society of Resource Geology. He has worked with D. Singer of USGS for fifteen years in the field of quantitative methods of mineral resource assessment and exploration. Presently working on (1) Application of quantitative methods to resource and environmental assessments; (2) Remote sensing for exploration; and (3) Subsurface modeling and simulation of tectonics.

His reason to run for office is to assist the international exchange of distributed databases for mathematical geology on the network environment.

Vera Pawlowsky-Glahn (*president*) is Profesora titular de universidad (Tenured Professor), Technical University of Catalonia (UPC), Barcelona, Spain (since 1986).

1982 - Degree in Mathematics, University of Barcelona; 1986 - Dr rer. nat., Free University Berlin, Division of Earth Sciences.

Research interests: statistical analysis of compositional data, geostatistics, spatial cluster analysis.

Administrative experience: UPC - vice-chancellor for Student Affairs (1990-93), vice-chancellor for Studies (1993-1994). School of Civil Engineering: Vice-Dean for Economic Affairs (1989-90), Assistant to the Dean (1998-99). Elected member of governing bodies and academic commissions of UPC.

Service to the Association: Councilor (1992-96); member of Mathematical Geology Student Award Committee (1989-90), President's Prize Committee (1991-93), Krumbain Medal Awards Committee (1996), Honours and Awards Commission (1997), Awards Committee (since 1998); Associate Editor of Mathematical Geology (since 1994); organisation of IAMG'97; Scientific Committee member of IAMG'98; co-chair of the symposium Mathematical Geology: Two Centuries of Quantification in Geology, 31st IGC.

Professional activities: Research and teaching at undergraduate and postgraduate level at UPC and Free University of Berlin; research at University of Hong Kong, Kansas Geological Survey, University of Florence. Principal investigator of three research projects with public funding, participation in nine. Seventy-five publications (articles, chapters in books, papers in proceedings, technical reports). Associate Editor of Stochastic Environmental Research and Risk Assessment.

Honours received: 1993 - Mathematical Geology Best Paper Award; 1994 - Silver medal of UPC for service to the institution.

Language skills: Spanish, German, English, Catalan - fluent; Italian, French - understanding, Russian - elementary training.

Reasons to run for office: The wish to participate actively in the worldwide expansion and professionalization of IAMG. Main goals: introducing mathematical geology as a specific subject in different international classifications of science into fields of knowledge, reinforcing our educational goals, improve relationships with sister organisations, creation of a permanent office.

Maria-Theresia Schafmeister (*councilor*) has a full professorship in Applied Geology at Ernst-Moritz-Arndt-University, Greifswald/Germany

Academic Record: 1977-1984 Studies in Geology-Paleontology at Kiel and Berlin, Germany; 1989 PhD in Geology (Hydrogeology/Geostatistics) at Freie Universität Berlin; 1998 Habilitation published as "Geostatistik für die hydrogeologische Praxis"; 1990-1997 Assistant Professor at the Institute for Geology, Geophysics and Geoinformatics, Dept. of Mineral Resources and Environmental Geology. Teaching activities: Mathematical geology, geostatistics, groundwater modeling, hydrogeology for undergraduate and postgraduate students in Germany and abroad.

Professional interests: hydrogeology, environmental and engineering geology, Quaternary geology. Special research topics: Groundwater modeling, parameter identification, uncertainty in model prediction, regionalization, soil/groundwater pollution, groundwater management in coastal areas. Since 1999 Allies Manager for IAMG.

As council member of IAMG my main goal would be to encourage young geoscientists to make use of mathematical models and methods in their fields of research, mainly in environmental geology and hydrogeology. Working at a university in East Germany, close to the Polish border, my goal will further be to improve contacts between IAMG and East European research institutions. My main private interests: Music, tango dancing and reading, playing, biking with my 5 year old son David-Michael.



John Tipper (*secretary general*) is Professor of Geology at the University of Freiburg. Born in England, he graduated from Cambridge (BA 1970) and Edinburgh (PhD 1974). From 1973 to 1974, he held a Royal Society Postdoctoral Fellowship at the University of Bonn, where he developed the first computerised technique for reconstructing geological objects from serial sections. At the Kansas Geological Survey (1974-78) he worked on geological applications of CAD methods, resulting in the 1979 KGS monograph 'Surface Modelling Techniques'. In 1978, he moved to University College Galway, Ireland, where he taught stratigraphy and paleontology. His research at this time became focussed on quantitative and theoretical aspects of stratigraphy, and these remain his principal research interests today. In 1984, he joined the Australian National University as Lecturer in Basin Analysis, until taking up the Freiburg Professorship in 1992.

John has been an IAMG member since 1973, and was a Councillor from 1992 to 1996. He has worked actively on numerous IAMG committees, and is currently Chairman of the Education Committee. He is on the Editorial Boards of Mathematical Geology (1995-) and Computers & Geosciences (1981-), and is a member of the Publications Committee. He received the 1991 Best-Paper Award for Computers & Geosciences, for his paper describing a linear-time algorithm for the Voronoi diagram.

John's other professional affiliations are with the Palaeontological Association, Geological Society of Australia, Association of Australasian Palaeontologists, SEPM, and International Association of Sedimentologists. He has also been active in the Consortium for Ocean Geosciences of Australian Universities, and was its Secretary from 1986 to 1989.

Having worked in many different countries, John is particularly conscious of the continuing need to foster communication between mathematical geologists worldwide; he regards this as one of the IAMG's principal tasks, and the one with which the Secretary-General is most directly concerned. He also believes firmly that the IAMG has a duty to the future: it must promote the training of mathematical geologists, it must ensure that this training is intellectually rigorous, and it must strive to make this training relevant to the industries to which mathematical geology is important.

Gert Jan Weltje (*councilor*) was born in 1962 in Eindhoven, The Netherlands. He obtained his BSc, MSc and PhD in Earth Sciences at Utrecht University in 1984, 1988 and 1994, respectively. Between 1989 and 1993, he held several temporary research and teaching positions at the Earth-Science Faculty of Utrecht University. He carried out post-doctoral research with the department of Nuclear Physics, University of Groningen (1994), and with the department of Sedimentary Geology of the Free University, Amsterdam (1995-1997), both in the Netherlands. During the same period, he also worked as a statistical-sedimentological consultant for various oil companies. Since 1997 he has been employed as assistant professor of Mathematical Geology at the Faculty of Civil Engineering and Applied Geosciences, Delft University of Technology, and as a researcher in quantitative sedimentary geology at the Netherlands Institute of Applied Geosciences TNO (National Geological Survey), Utrecht. He is the treasurer of the Royal Geological and Mining Society of the Netherlands, and a member of the executive committee of the Research School Centre for Technical Geosciences (Delft, Netherlands). He is a member of the IAMG Membership Committee, has helped in establishing IAMG guidelines for grants, and was involved in organizing a session on general mathematical geology for IAMG'99. His main reason to run for office is that he wants to promote the use of mathematical methods in geology, and feels that playing an active part in the IAMG is the best way to accomplish this goal. His research is mainly directed towards methodological advancements in sedimentary geology, through formalisation and quantification of geological knowledge. Specific fields of interest include

the development of sedimentary process simulators for predictive geological and petrophysical reservoir modelling, and inversion of the stratigraphic record. He received the Vistelius Research award of the IAMG in 1997 for his work on inverse modelling of compositional data in sedimentology (see also: <http://www.iamg.org/vistelius1997.html>).



Internet Geology is a News Letter devoted to the petroleum geology of the Newly Independent States of the Former Soviet Union. It is distributed electronically without cost. If you are interested in receiving it respond to James Clarke at: <jamesclarke@erols.com> or by fax at (703) 759-3754.

IAMG and IMAG: two creations of A.B. Vistelius

The name of Prof. Andrei Vistelius and the fact that it was he who founded IAMG are known to any mathematical geologist in the world. But do many of our colleagues know that after founding IAMG, in 1991 Vistelius gave birth to its younger brother - the Institute of Mathematical Geology (IMAG) of the Russian Academy of Natural Sciences, in St. Petersburg, Russia? Not only do they have very similar abbreviations and a common founder but IMAG and IAMG are virtually "brother establishments".

The history of IMAG actually started much earlier, in 1952, when Vistelius organized the first team in St. Petersburg, which eventually became an institute. In that totalitarian country many sciences including genetics, cybernetics, econometrics, etc., methodologically close to mathematical geology, were zealously suppressed. Nevertheless, the achievements of that team, migrating from one institute to another, always under suspicion by the Marxist-Leninist ideologues, were so notable and recognized by the international community that they provided, among others, a substantial reason to set up an international association, namely IAMG, in 1968.

Despite the change of political climate by 1991 when IMAG was established, the newly formed Institute from its very first days encountered severe economic problems that have become the unfortunate background of any research activity in Russia. Nevertheless, we have survived and reached maturity. The intellectual heritage of Prof. Vistelius, a true "chevalier sans peur et sans reproche" in life and in science, must be preserved and further developed. He left a programme for development of mathematical geology he entitled "The formulation of mathematical (analytical) geology as the paradigm for geoscience in the 21st century". This determines precisely the main directions for our activities in different fields of geology. At present, these activities include the following:

1. Research on the axiomatics of robust U/Pb isotopic age estimation of zircons. This work was begun yet by Vistelius and is continued now by Prof. Klebanov and Dr. Faas. Leading geochemists worldwide realized the great significance of precise values of geologic age estimations by isotopic dating. Thus, Prof. Yoder suggested that Prof. Vistelius should publish his material in any of the leading geologic journals, and intended to organize a wide international discussion of these problems.
2. Markov chain modeling of granite formation in terms of mineral grain succession. Starting with a model of the ideal granite with subsequent crystallization of quartz and feldspars, as suggested by Vistelius, considerable progress has been made in modeling various rocks compositionally close to granite, including strongly metasomatised and ore-bearing rocks. The methodology and geologic implications have been reported by Drs. Ivanov and Kotov.
3. Study of the influence of the crystalline basement on chemical composition of Mesozoic granitoids of the North-East Eurasia. A new understanding of the structure of this vast territory, based on comparative trend analysis of multidimensional rock composition data, is being developed by Drs. Ivanov and Romanova, and reported in a number of international publications describing both geological and methodological implications of this work.
4. Modeling the mafic to ultramafic layering and related ore production in

the Bushveld pluton, South Africa, and in plutons of Fennoscandia in terms of Markov chain theory, latent periodicity method, fractal geometry and the theory of nonlinear equations adequate to dynamic systems of chaos and order is a project carried out by Prof. Glebovitsky, Drs. Dech, Priyatkin, Pisakin and Kotov in collaboration with South-African colleagues. The study incorporates a wide range of petrographic, chemical, and petrophysical properties of rocks. The application of numerical methods is preceded by strict phenomenological descriptions.

5. Modeling transportation of clastic material in epicontinental seas based on the Fokker-Plank-Kolmogorov equation is being developed by Dr. Harlamov.

6. Modeling the sediment burial, and prediction of sediment properties for local stratigraphy of oil-and-gas fields is one of the best known research interests of Prof. Vistelius, now continued by Drs. Dech and Knoring. Clastic sediments are modeled in terms of Markov chains and carbonate sediments by means of spectral analysis including the latent periodicity method.

7. A stochastic model for solvent transfer of matter through a porous medium in terms of semi-Markov processes is the focus of investigation of Dr. Harlamov that have brought a number of important implications for chromatography, metamorphic and petroleum geology.

8. Optimization of the location of oil-and-gas prospecting wells, and minimization of their number based on the theory of optimal experiment, is an economically extremely beneficial project promoted by Drs. Dech and Knoring.

9. A new direction of work recently started at IMAG is in the application of artificial intelligence to volcanology and geohazard modeling, carried out by Dr. Pshenichny.

In addition to the research work, IMAG has established a joint publishing house THEOPHRASTUS Pbl., St. Petersburg - Athens, in collaboration with THEOPHRASTUS Pbl., Athens, and has published a number of books in English. The latest one, "Capricious Earth: Models and Modeling of Geologic Processes and Objects", to be published in 1999, encompasses a wide range of modern approaches to modeling in geology.

The website of IMAG will be available soon and will tell you more about our activities. Also, a paper by Dech and Glebovitsky "Establishment of mathematical geology in Russia", submitted to *Mathematical Geology*, describes the history and present-day state of this science in its birthplace in much greater detail than this short article. We hope you will find it worth your attention. We are open for communication and look forward to your feedback!

Victor N. Dech
Cyril A. Pshenichny
St. Petersburg

The authors would like to acknowledge the help of Dr. Stephen Henley with the editing of their English translation.

Dr. Pshenichny can be reached by e-mail: pshenich@kp1306.spb.edu

Conference Report: "Spatial and Environmental Statistics"

The first mathematical colloquium "Spatial and Environmental Statistics" was held as part of the 50th Annual Assembly of Mining and Metallurgical Engineering in Freiberg, Germany on June 17-18, 1999. The colloquium was organized by the Graduate College on Spatial Statistics and the Interdisciplinary Environmental Research Centre of Freiberg University of Technology and Mining, and the International Graduate School Zittau.

The contributions to the meeting were focused on such topics as geostatistics, sampling theory, design of statistical experiments, spatial statistics, and environmental statistics. Theoretical and methodological advances as well as applications to practical problems were presented in 27 talks and posters.

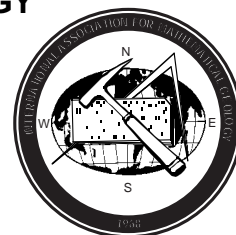
Professor Valerie Isham, London University College, opened the colloquium with a plenary talk about modelling and analysis of spatial processes, and interpretation of empirical data - addressing some of the basic problems. She exemplified her methods by applications to air and soil pollution modelling. Professor Helmut Moritz, University of Technology, Graz, Austria, reported on collocation with least squares as a general method for the determination of the parameters of the gravity field. He emphasized the two variants of interpretation - the analytical and the statistical view. His contribution was followed by a talk by Professor Ute Herzfeld, University of Trier, Germany, on the same subject matter but with a comple-

mentary point of view. She presented an overview of kriging methods and their equivalents. These methods for interpolation, approximation (smoothing), and prediction have been analysed and compared with respect to their common mathematical grounds and their different mathematical assumptions and objectives. Professor Pierre M. Gy, Cannes, France, gave an electrifying talk about sampling theory and experimental design, and their all too often forgotten importance in earth and environmental sciences. Sampling was also the theme of the plenary talk given by Professor Ganapati P. Patil, Penn State University. His talk on environmental sampling and observational economy put forward methods of encounter, adaptive, composite, and ranked set sampling.

On the occasion of the colloquium the special interest group "Computer Sciences in Geosciences" of the German Geological Society (DGG) held its annual convention in Freiberg on June 18, 1999. The newly elected executive committee is lead by Prof. Helmut Schaeben, Freiberg, and includes Dr. Heinz Burger, Berlin, and Prof. Karl Stattegger, Kiel. The board thanked Prof. Wolfdietch Skala, Berlin, for more than 20 years of championing a developing mathematical geology, and applications of mathematics and computer sciences in geosciences. In 1979 he organized and taught the first short course on Mathematical Methods and Computer Sciences in Geosciences at the FU in (formerly West) Berlin. During the following 20 years he lead the growing group of aficionados, which grew much stronger in the early 90ies through an informal union with colleagues from the former GDR, to formally establish themselves as special interest group.

H. Schaeben

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- Computers & Geosciences, student (proof of enrollment required) \$ 35.50
- Natural Resources Research (previously Nonrenewable Resources) \$ 49.00

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- #2: "Oil and Gas Forecasting – Reflections of a Petroleum Geologist" by Lawrence J. Drew US\$ 42.00
- #3: "Geostatistical Glossary and Multilingual Dictionary" edited by Ricardo Olea \$ 31.50
- #5: "Computers in Geology – 25 Years of Progress" ed. by John J. Davis and Ute Herzfeld \$ 38.50

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Upcoming Meetings

International OIL PRICE RISK MANAGEMENT, Oxford, UK, **29 Nov -3 Dec 1999**. The College of Petroleum and Energy Studies, Tel: +44 186 526 0203, Fax: +44 186 579 1474

AMERICAN GEOPHYSICAL UNION (Fall Meeting), San Francisco, California, USA, **13-17 December 1999**. AGU Meetings Department, 2000 Florida Avenue, NW, Washington, DC 20009, USA; Phone: +1 202 462 6900; Fax: +1 202 328 0566; E-mail: meetinginfo@kosmos.agu.org; Website: <http://www.agu.org>

SURFACE MODELLING IN GEOGRAPHY, Brighton, UK, **4-7 Jan. 2000**. Dr Nick Tate or Dr. Peter Atkinson, Department of Geography University of Southampton Southampton SO17 1BJ; E-mail: P.M.Atkinson@soton.ac.uk . <http://www.geog.le.ac.uk/njt9/call.htm>

PHYSICS OF ACCRETION AND ASSOCIATED OUTFLOWS. Copenhagen, Denmark, **5-8 Jan. 2000**. +45 3532 5900, fax: +45 3532 5910, email: uhl@tac.dk. <http://www.tac.dk/meetings/discs2000/>

International Conference on ENVIRONMENTAL MODELING & SIMULATION, San Diego, Calif., **23-27 Jan. 2000**. Dr. Jin-Yi Yu, Dept. of Atmospheric Sciences, UCLA, Hilgard Ave., Los Angeles, CA 90095-1565. Phone: 310/206-3743. Fax: 310/206-5219. E-mail: yu@atmos.ucla.edu. WWW: <http://www.atmos.ucla.edu/~yu>

PETROLEUM SYSTEMS OF SEDIMENTARY BASINS IN THE SOUTHERN MIDCONTINENT. 13th Annual OGS Workshop, hosted by: Oklahoma Geological Survey, Kansas Geological Survey, and the International Association for Mathematical Geology, Norman, OK, **23-24 Feb. 2000**. Kenneth S. Johnson, Oklahoma Geological Survey, University of Oklahoma, 100 East Boyd St., Room N-131, Norman, OK 73019. Phone: 800/330/3996. Fax: 405/325-7069

Society for MINING, METALLURGY, AND EXPLORATION, Salt Lake City, Utah, USA, **6-9 March 2000**. SME, 8307 Shaffer Parkway, P.O. Box 625002, Littleton, CO 80162-5002, USA; Phone: 1 303 973 9550; E-mail: smenet@aol.com

The nature and tectonic significance of FAULT ZONE WEAKENING, London, UK, **8-9 March 2000**. R.E. Holdsworth, Department of Geological Sciences, University of Durham, Durham DH1 3LE, UK; Fax: +44 0191 374 2510; E-mail: R.E.Holdsworth@durham.ac.uk; Website: <http://www.dur.ac.uk/~dgl1ms/reh.htm>

PERMIAN BASIN Oil and Gas Recovery Conference - "Technology for the New Millennium", Midland, Texas, **21-23 March 2000**. (001) 972-952-9393 for more information. <http://www.spe.org/events/2000ogr/callform.html>

6th International GEOSTATISTICS CONGRESS, Capetown, South Africa, **10-14 April 2000**. The deadline for submission of the final papers has been extended to Nov.30, 1999. Lesley Stephenson, Conference Co-ordinator, P O Box 327, Wits, 2050, South Africa. Tel: (0011) 27 11 716 5091; Fax: (0015) 27 11 339 7835 E-mail: stephenson@egoli.min.wits.ac.za

Society for SEDIMENTARY GEOLOGY Annual Meeting. New Orleans, LA, USA, **16-19 April 2000**. Judy Tarpley, 918-493-3361 ex. 22, fax: 918-493-2093, email: jtarpley@sepm.org. http://www.sepm.org/research/conferences/sepm_conferences.html

AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS, ann. mtg., New Orleans, La., **16-19 April 2000**. AAPG, 1444 So. Boulder Ave., P.O. Box 979, Tulsa, OK 74101-0979. Phone: 918/560-2639. Fax: 918/560-2626, E-mail: dkeim@aapg.org

OTC 2000, 32nd Offshore Technology Conference, Houston, Texas, USA, **1 - 4 May 2000**. Society of Petroleum Engineers Tel: +1 972 952 9393, Fax: +1 972 952 9435 E-mail: rsoussi@spelink.spe.org

SALT SYMPOSIUM, The Hague, The Netherlands, **7-11 May 2000**. Secretariat Organizing Committee 8th World Salt Symposium, PO Box 25, 7550 GC Hengelo Ov, The Netherlands. Phone: 31 74 2443908. Fax: 31 74 2443272. E-mail: Salt.2000@inter.NL.net

GEOLOGY AND ORE DEPOSITS 2000: The Great Basin and Beyond, symposium, Reno and Sparks, Nev., **15-18 May 2000**. Geological Society of Nevada, Nevada Bureau of Mines and Geology, et al. Geological Society of Nevada, P.O. Box 12021,

Reno, Nev. 89510-2021. Phone: 702/323-3500. Fax: 702/323-3599, E-mail: gsnsymp@nbgm.unr.edu; Website: <http://www.seismo.unr.edu/GSN>

TRACERS AND MODELLING IN CONTAMINANT HYDROLOGY, Liège, Belgium, **23-25 May 2000**. TraM'2000, LGIH, University of Liège, B19 Sart-Tilman, 40000 Liège, Belgium; Phone: +32 4 366 2216; Fax: +32 4 366 2817; E-mail: adassarg@lgih.ulg.ac.be

World GEOTHERMAL Congress 2000, Kyushu-Tohoku, Japan, **28 May -10 June 2000**. International Communications Specialists, Inc. Sabo Kaikan-bekkan, 2-7-4 Hirakawa-cho, Chiyoda-ku Tokyo 102-8646, JAPAN; +81-3-3987-5793, fax: +81-3-3987-5796, email: info@wgc.or.jp or wgc2000@ics-inc.co.jp. Abstracts due December 31, 1998; <http://www.wgc.or.jp/>

EAGE 62nd Conference and Technical Exhibition, Glasgow, UK, **29 May - 2 June 2000**. 31-30-696-2655, e-mail: eage@eage.nl

AMERICAN GEOPHYSICAL UNION (Spring Meeting), Washington, DC, **30 May - 3 June 2000**. AGU Meetings Department, 2000 Florida Avenue, NW, Washington, DC 20009 USA ; Phone: +1 202 462 6900; Fax: +1 202 328 0566; E-mail: meetinginfo@kosmos.agu.org; Website: <http://www.agu.org>

Chapman Conference on the GAIA HYPOTHESIS. Valencia, Spain, **19-23 June 2000**. 800/966-2481 or 202/462-6900, fax: 202/328-0566, email: meetinginfo@agu.org. Abstracts due: February 15, 2000. <http://earth.agu.org/meetings/cc00bcall.html>

William Smith Millennium Meeting: CELEBRATING THE AGE OF THE EARTH. The Geological Society. London, England, **28-29 June 2000**. Dr. Cherry Lewis, History of Geology Group, Wells Cottage, 21 Fowler Street, Macclesfield, Cheshire SK10 2AN. Tel/ fax: 01625 260049. Email: clelewis@aol.com, <http://www.geolsoc.org.uk/g3gnmtg.htm>

4th International Symposium on SPATIAL ACCURACY ASSESSMENT in Natural Resources and Environmental Sciences, Amsterdam, **12-14 July 2000**. Symposium chair Dr Gerard B.M. Heuvelink, University of Amsterdam, Nieuwe Prinsengracht 130, 1018 VZ Amsterdam, The Netherlands. E-mail: accuracy@frw.uva.nl, <http://www.gis.wau.nl/Accuracy2000>

"GEO-INFORMATION FOR ALL" (19th International Congress of the International Society for Photogrammetry and Remote Sensing), Amsterdam, **16-22 July 2000**. Prof. K.J.Beek, PO Box 6, 7500 AA Enschede, The Netherlands; Phone: +31 (0) 53 4874214; Fax: +31 (0) 53 4874200; E-mail: beek@itc.nl

31st Int'l GEOLOGICAL CONGRESS - Geology and Sustainable Development: challenges for the Third Millennium, Rio de Janeiro, Brazil, **6-17 August 2000**. IGC Secretariat Bureau, Av. Pasteur, 404, Anexo 31 ICG, Urca, Rio de Janeiro - RJ - CEP 22.290-240, Brazil, Tel. (0055-21) 295-5847, Fax: (0055-21) 295-8094, E-mail: 31igc@crystal.cprm.gov.br, Website: www.31igc.org

JOINT STATISTICAL MEETINGS "Celebrate Diversity in Statistics", Indianapolis, Indiana, **13-17 August 2000**. American Statistical Association / Institute of Mathematical Statistics International Biometric Society, ENAR and WNAR Statistical Society of Canada. E-mail: meetings@amstat.org; phone (703) 684-1221.

GOLDSCHMIDT 2000, Oxford, UK, **3-8 September 2000**. P. Beattie, Cambridge Publications, Publications House, PO Box 27, Cambridge UK CB1 4GL; Phone: +44-1223 333438; Fax: +44-1223 333438; E-mail: Gold2000@camppublic.co.uk; Website: <http://www.camppublic.co.uk/science/conference/Gold2000/>

SEG International Exposition and 71st Annual Meeting, San Antonio, Texas, **9-14 Sept. 2000**. Society of Exploration Geophysicists, SEG Business Office, Phone: 918/497-5500. Fax: 918/497-5557. WWW: <http://seg.org>

ECCOMAS2000, European Congress on Computational Methods in Sciences and Engineering, Barcelona, **11-14 September 2000**. SEMNI, Edificio C-1, Campus Norte (UPC), C/Gran Capitán, s/n, 8034 Barcelona, Spain, ph. +34 93 401 6487, fax: +34 93 401 6517, e-mail: eccomas2000@etsecpb.upc.es, <http://cimne.upc.es/cimne/congresos/eccomas.htm>

SPE Annual Meeting, New Orleans Louisiana, **1 - 4 October 2000**. 214-952-9393. SPE Annual Technical Conference and Exhibition, Dallas, Texas, U.S.A. Deadline for submission: 15 December 1999

GEOLOGICAL SOCIETY OF AMERICA, ann. mtg., Reno, Nev., **13-16 Nov. 2000**. GSA Meetings, Box 9140, Boulder, CO 80301-9140. Phone: 303/447- 2020, ext. 164. Fax: 303/447-1133

geoENV2000 3rd European Conf. on Geostatistics for Environmental Applications, Avignon, France, **22-24 Nov. 2000**. Unite de Biométrie, INRA, Domaine St. Paul, Site Agroparc, 84914 Avignon cedex 9, France; ph. +33 432 712170, fax: +33 432 712182, email: geoenv2000@avignon.inra.fr <http://www.avignon.inra.fr/biometrie/geoenv2000>

DEEP WATER RESERVOIRS of the World, research conf., Houston, Tex. **3-6 Dec. 2000**. GCSSEPM Foundation, WWW: <http://www.gcssepm.org>

Advanced RESERVOIR CHARACTERIZATION for the 21st Century, research conf., Houston, Texas, **5-8 Dec. 2000**. GCSSEPM Foundation, WWW: <http://www.gcssepm.org>

FROM MAGMAS TO MUD (and back), Mineralogical Society Millennium Conference on the generation, diagenesis, metamorphism, and anatexis of mudrocks, University of Reading, United Kingdom, **13-15 Dec. 2000**. Dick Merriman, British Geological Survey, Keyworth, Nottingham, NG12 5GG, U.K. Phone: 44 (0)115 936 3417. Fax: 44 (0)115 936 3352. E-mail: r.merriman@bgs.ac.uk

GEOSYNTHETICS in the Next Millennium, ann. conf., Philadelphia, Pa., **14-15 Dec. 2000**. Ms. Marilyn Ashley, Geosynthetic Institute, 475 Kedron Ave., Folsom, Pa. 19033-1028. Phone: 610/522-8440. Fax: 610/522-8441. E-mail: marilyn.ashley@coe.drexel.edu

AGU Fall Meeting, San Francisco, Calif., **15-19 Dec. 2000**. AGU Meetings Dept., 2000 Florida Ave., NW, Washington, DC 20009. Phone: 202/462-6900. Fax: 202/328-0566. E-mail: meetinginfo@agu.org. WWW: <http://www.agu.org/meetings>

AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS (Annual Meeting), Denver, Colorado, **3-6 June 2001**. AAPG Conventions Department, P O Box 979, 1444 S. Boulder Ave., Tulsa, OK 74101-0979, USA. Phone: +1 918 560 2679; Fax: +1 918 560 2684 or 800/281-2283; E-mail: dkeim@aapg.org

IAMG Annual Meeting, Cancun, Mexico, **6-12 June 2001**. Jorgina Ross, Kansas Geol. Survey, convenor. <http://www.kgs.ukans.edu/Conferences/IAMG/index.html>

63rd EAGE Conference & Technical Exhibition, Amsterdam, The Netherlands, **11-16 June 2001**.

International Conference on GEOMORPHOLOGY (5th), Tokyo, Japan, **23-28 August 2001**. Prof. Kenji Kashiwaya, Dept. of Earth Sciences, Kanazawa University, Kakuma, Kanazawa 920-1192, Japan; Phone & Fax +81-76 264 5735; E-mail: kashi@kenroku.kanazawa-u.ac.jp; Web Site: wwwsoc.nacsis.ac.jp/jgu/

Pei-Jen (PJ) Lee † 1999

PJ Lee passed away suddenly of a heart attack on November 1. PJ was a very kind man, friends with everybody who knew him.

After receiving his doctoral degree from McMaster University of Canada where Gerry Middleton was his thesis supervisor and Frits Agterberg his external examiner, he worked for Home Oil Company and then joined the Geological Survey of Canada in Calgary in 1979. In 1996, he became Professor and Chairman of the Department of Earth Sciences, National Cheng Kung University of Taiwan. After returning to Canada as President of Perspective Information Inc., he was involved in a new project for a computer system for assessing landslide hazard in conjunction with the National Cheng Kung University.

P. J. had over forty years of experience in petroleum geology, basin analysis and petroleum resource evaluation, and developed a computer-aided Petroleum Information Management and Resource Evaluation System (PETRIMES/W), for estimating undiscovered petroleum resources. He had more than 80 scientific articles published in various international journals.

Among the many honors P.J. received were the Gold Medal in 1993 presented by the First Annual Celebration of Information Management in the Excellence in the Federal Government of Canada; he was the recipient of the Commemorative Medal for the 125th Anniversary of the Confederation of Canada presented by the Governor General of Canada; and the outstanding research awards for 1996, 1997, and 1998 presented by the National Science Council of Taiwan.

When he agreed to run for councilor of the IAMG he wrote: "As a Charter Member, IAMG is like family to me, and a very important part of my career. I have agreed to run for the Ordinary Council because it gives me much pleasure to work within this dynamic organization whose members undertake the responsibility of contributing to the field of mathematical geology. I have gained great personal reward by working with IAMG members, and would like to dedicate my time and experience to work for this enthusiastic organization."

Conference Report: BGI'99

The international BioGeoImages'99 conference on "image analysis and morphometry of geological objects: from fossils to rock forming features" was held in Dijon from September 6 to 9, 1999. Eighty people from fourteen countries participated. The majority of financial support came from the IAMG, SEPM, Burgundy Region and University of Burgundy.

Paleontologists using morphometry or image analysis rarely exchange points of view with sedimentologists or biologists (and vice versa) regarding the tools involved in these particular methods. The aim of the conference was to supply the opportunity for geologists and biologists of various research fields to meet: therefore this conference was truly pluridisciplinary by definition.

The conference was divided into several sessions on the following topics: (1) methods in image analysis and morphometry, (2) points and curves, (3) growth and forms, and (4) pores and particles. The last morning was devoted to posters and software presentation. Four invited lectures were given during the three last topics. Prof. Fred Bookstein (University of Michigan) presented the current state of morphometrics with hints about the near future. Using biological objects, he introduced a new method called "creases" for the localization of shape phenomena in extended data sets. This very



Fred Bookstein, Eric Verrecchia, Pete Lestrel and Bob Ehrlich.

promising method combined with thin plate spline and landmarks greatly extends the power of biomorphometrics. Prof. Pete Lestrel (University of California) presented the latest advances in Fourier descriptors, emphasizing elliptical Fourier functions in biomorphometrics. Prof. Fred Truchetet (University of Burgundy) introduced image multiresolution analysis and wavelet transform, illustrated with geological examples (a digital elevation model and growth increments in shells). Prof. Bob Ehrlich (University of Utah) proposed a synthesis between physics and image analysis in order to understand porous rock media.

The conference was a forum for presenting new methods and tools for image and shape analysis in quantitative paleontology, sedimentology, and petrology, such as:

- microfocus computer tomography for petrology,
- wavelet analysis and fractals in petrological data sets,
- neural network classifiers in microfossil recognition,
- modelization of sedimentary laminar structures using cellular automata or the KPZ equation,
- automatic phase analysis,
- Bezier curves and EFF for biomorphometrics,
- characterization of carbonate reservoirs using 2D and 3D image analysis,
- new tools for separation and shape characterization of grains, and comparison with visual charts.

The success of the conference was in large part due to the support given by the IAMG. Many of the participants suggested that a BGI conference be held every three years in Dijon (while under the influence of the fine cuisine and Burgundy wine at the banquet). This proposal is currently under consideration.

All the abstracts are still available at the following website: www.u-bourgogne.fr/BIOGEOSCIENCE/Abstract.html. A special issue of Mathematical Geology is in progress.

Eric Verrecchia, organizer



Course Announcement

Weiterbildendes Studium
**“Mathematische Methoden und Modelle in den
Geowissenschaften”**

Ein interdisziplinäres Studium aus Teilbereichen der Geowissenschaften, Angewandten Mathematik und Informatik. Der nächste Kurs findet vom 21. Februar bis 10. März 2000 statt.

Kurs I

1. Statistische Analyse von Geodaten
Prof. W. Skala, C. Riestler, 21. - 25. 2. 00
2. Multivariate Statistik
Dr. G. Heyn, Priv.Do. H. Thiergärtner, 28. 2. - 3. 3. 00
3. Geoinformationssysteme
Prof. F. K. List, Dr. N. Ott, 6. - 10. 3. 00

*Hinweis: im Feb. / März 2001 findet Kurs II statt.
Dieser umfaßt die Themenbereiche:*

1. Geostatistik
2. 3D-Modellierung
3. Prozeßmodellierung

Einzelheiten werden rechtzeitig angekündigt.

Die Teilnahmegebühr beträgt pro Woche 220 DM (bzw. 150 DM für Arbeitslose / -suchende), für den gesamten dreiwöchigen Kurs 650 DM (bzw. 450 DM).

Anfragen bzw. Bewerbungen um einen Studienplatz (bis 30. Nov. 1999):

Prof. Dr. Wolfdietrich Skala
Freie Universität Berlin, FB Geowissenschaften, FR Geoinformatik
- Kennwort Weiterbildendes Studium -
Malteserstr. 74-100, Haus D, 12249 Berlin

Aktuelle und ausführliche Infos im Web:
<http://userpage.fu-berlin.de/~riester/wbs.html>

WH BRYAN MINING GEOLOGY RESEARCH CENTRE

**Senior Research Fellow/Research Fellow
Geostatistics/Operations Research**

Applications are invited for the position of a *Senior Research Fellow/Research Fellow/ Post Doctoral Research Fellow* in Geostatistics and Operations Research at the WH Bryan Mining Geology Research Centre (BRC).

The BRC is a member of the Sir James Foots Institute of Mineral Resources at The University of Queensland. The University of Queensland is one of the largest mining and mineral research centres in the world. The BRC provides state of the art facilities and a stimulating, high tech and professional environment in which to work. The Centre conducts advanced applied research in geostatistics, resource modelling, mine optimisation and planning. BRC staff includes experts in their fields. The Centre has links to and conducts collaborative research with major mining companies.

The successful applicant will have a PhD in either geostatistics, operations research, or a closely related field. Applicants should have a research background, strong computing skills and be able to work independently and as part of a team. Mining industry experience would be an asset. The successful applicant will be expected to conduct advanced research in geostatistics and related computing systems. In addition, the applicant would be expected to participate in collaborative industry projects, interact with the Mining Industry and contribute to the teaching activities of the Centre. Salary will be commensurate with level, qualifications and experience.

Applications should include curriculum vitae and the names of at least two referees and be forwarded to: Prof. R Dimitrakopoulos, WH Bryan Mining Geology Research Centre, The University of Queensland, Brisbane, Qld 4072, Australia

Applications close: 31st January, 2000 Further information on any of the above can be obtained from the WH Bryan Mining Geology Research Centre, University of Queensland, Brisbane, Qld 4072, Australia. Phone: 61 (0)7 3365 3473, Fax: 61 (0)7 3365 7028. E-mail: brc@mailbox.uq.edu.au Web: www.minmet.uq.edu.au/~bryan

International Association for Mathematical Geology

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