Elements

An International Magazine of Mineralogy, Geochemistry, and Petrology

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Diamonds

ADVERTISING

Elements

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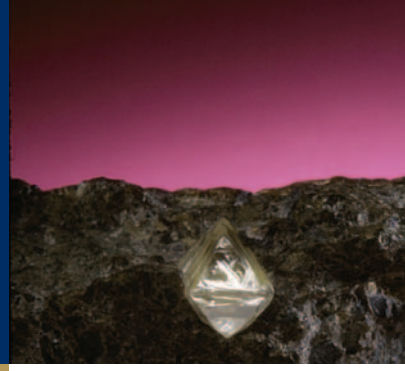

About the cover: Diamond, the ultrahard cubic form of carbon, is a mineral requiring a long string of superlatives to describe its properties, its technological and commercial importance, and its roots into human culture and our physical world. Pictured is the Minton diamond octahedron (7 mm across) in kimberlite from the De Beers Mine, Kimberley, South Africa. Photo by Denis Finnin, courtesy of American Museum of Natural History.

Elements is published jointly by the Mineralogical Society of Great Britain and Ireland, the Mineralogical Association of Canada, the Geochemical Society, The Clay Minerals Society, the European Association for Geochemistry, the International Association of GeoChemistry, and the Mineralogical Society of America. It is provided as a benefit to members of these societies.

Elements will be published three more times in 2005. Individuals are encouraged to join any one of the participating societies to receive *Elements*. Institutional subscribers to any of the following journals – *American Mineralogist, The Canadian Mineralogist, Clays and Clay Minerals* – will also receive *Elements* as part of their subscription. Institutional subscriptions are available for US$100 a year. Contact the managing editor for information.

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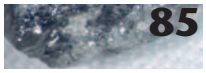

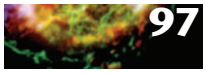

Diamonds

George E. Harlow and Rondi M. Davies
Guest Editors

Departments

The Mineralogical Society of America is composed of individuals interested in mineralogy, crystallography, petrology, and geochemistry. Founded in 1919, the Society promotes, through education and research, the understanding and application of mineralogy by industry, universities, government, and the public. Membership benefits include special subscription rates for *American Mineralogist* as well as other journals; 25% discount for *Reviews in Mineralogy and Geochemistry* series and *Monographs*; *Elements*, reduced registration fees for MSA meetings and short courses; and participation in a society that supports the many facets of mineralogy. For additional information, contact the MSA Business Office.

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The International Association of Geochemistry (IAGC) has been a pre-eminent international geochemical organization for over 40 years. Its principal objectives are to foster cooperation in, and advancement of, applied geochemistry, by sponsoring specialist scientific symposia, the activities organized by its working groups, and supporting its journal *Applied Geochemistry*. The administration and activities of IAGC are conducted by its Council, comprising an Executive and ten ordinary members. Day-to-day administration is performed through the IAGC Business Office.

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The Mineralogical Society of Great Britain and Ireland was founded in 1876 and has the general object of advancing the science of mineralogy and its application to other subjects including crystallography, geochemistry, petrology, environmental science, and economic geology. The Society furthers its objects through scientific meetings and the publication of scientific journals, books, and monographs. The Society publishes three journals, *Mineralogical Magazine* (print and online), *Clay Minerals* (print and online) and the e-journal *MINABS Online* (launched in January 2004). For full details on how to join the Society and its events and publications consult the Society's website at www.minersoc.org or contact the General Office.

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The Mineralogical Association of Canada was incorporated in 1955 to promote and advance the knowledge of mineralogy and the related disciplines of crystallography, petrology, geochemistry, and economic geology. Any person engaged or interested in the fields of mineralogy, crystallography, petrology, geochemistry, and economic geology may become a member of the Association. Membership benefits include a subscription to *Elements*, reduced cost for subscribing to *The Canadian Mineralogist*, a 20% discount on short-course volumes and special publications, and a discount on the registration fee at our annual meeting.

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The Clay Minerals Society (CMS) began as the Clay Minerals Committee of the U.S. National Academy of Sciences – National Research Council in 1952. By 1962, the CMS was incorporated with the primary purpose of stimulating research and disseminating information relating to all aspects of clay science and technology. The membership includes those interested in mineralogy, crystallography, geology, geochemistry, physics, chemistry, biology, agronomy, soils science, engineering, materials science, and industrial science and technology. The CMS holds an annual meeting, workshop, and field trips, and publishes *Clays and Clay Minerals* and the *CMS Workshop Lectures* series. Membership benefits include reduced registration fees to the annual meeting, discounts on the *CMS Workshop Lectures*, and *Elements*.

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The Geochemical Society is an international non-profit organization for scientists involved in the practice, study, and teaching of geochemistry. Our principal roles are to provide our members with programs and services that will help them to be better geochemists; to enrich the professional development and careers of geochemists through information, education, relationships, and resources; and to advance the thought and application of geochemistry.

Membership includes a subscription to *Elements*, access to the online quarterly newsletter *Geochemical News*, as well as an optional subscription to *Geochimica et Cosmochimica Acta* (24 issues per year). Members receive discounts on publications (GS Special Publications, MSA, Elsevier and Wiley/Jossey-Bass), and on conference registrations including the V.M. Goldschmidt conference, the fall AGU meeting, and the annual GSA meeting. For more details on our programs or information on how to join, please visit our website at: https://gs.wustl.edu

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Institutional subscribers to CMS, MAC, MS, and MSA journals are entitled to electronic access as part of their subscriptions.

American Mineralogist Contact the Mineralogical Society of America (MSA) Business Office (**business@minsocam.org**). Identify your institution and provide your IP address.

The Canadian Mineralogist Contact mac.amc1@sympatico.ca with your IP address and provide your subscription number.

Clays and Clay Minerals Go to the Ingenta web site, which hosts the electronic journal (www.ingenta.com), or start at The Clay Minerals Society (CMS) website (www.clays.org). You will find further instructions about registering and requesting access.

Mineralogical Magazine and ***Clay Minerals***. Go to the Ingenta web site, which hosts the electronic journal (www.ingenta.com). You will find further instructions about registering and requesting access.

Elements: Getting into the Swing

With this second issue of *Elements*, both the editorial team and you, the readers, will sense that we are getting into the swing of a new and exciting enterprise. From now on, each issue will be the responsibility of one of the three scientific editors and a guest editor. This gives me an opportunity to express, I can safely say on behalf of the entire geochemistry–petrology–mineralogy community, heartfelt thanks to the two people, Rod Ewing and Pierrette Tremblay, who more than any others have been responsible for the guiding vision, look, and feel of our magazine. Of course, we have benefited enormously from advice from many sources, but without Rod's clear vision and quiet persuasion, the whole concept would never have moved off the ground and attracted the support of the founding societies. And, as you thumb through this issue, consider the complexity of the production of *Elements*. Thematic articles, society news, various minor pieces, and advertising have to be integrated into an attractive whole, all within a tightly defined space and to an exact deadline. Pierrette does a superb job of piloting the whole ship through the sandbanks and narrows of the publishing business. Thanks too to Alex Speer and the MSA office staff, who took on the considerable task of orchestrating the first mailing of *Elements* to 6140 individuals in 82 countries and to 1258 libraries.

Elements belongs to the members of its supporting societies, and is connected to them through an Executive Committee and an Advisory Board. The Executive Committee is composed of one representative from each society experienced in its workings. It provides financial oversight, acts as a channel of communication between the magazine and the officers and staff of the societies, and approves the appointment of the principal (i.e. scientific) editors and members of the Advisory Board. The Advisory Board has representatives from each society plus some additional members, all chosen for their scientific standing and fields of interest. Their main roles are to propose potential thematic topics and guest editors for consideration by the principal editors, to provide informed advice and comment as need arises, and to act as reviewers. Thematic topics may also be suggested by interested individuals; a form is available on our website.

The three principal editors are appointed for staggered three-year terms, so that Rod Ewing will serve until the end of 2005, Mike Hochella until 2006, and myself until 2007. Replacements are suggested by the Executive Committee and reviewed by the principal editors for final approval by the Executive Committee. The principal editors intend to meet at least twice a year, and of course we exchange a great deal of e-mail messages. Seeing full-colour pdf files of proofs materialize on my computer screen when I'm working from my cottage in the Scottish Highlands is wonderful—an e-miracle. Guest editors are taking on a substantial task, because they are responsible for getting manuscripts and illustrations up to pre-production standard with fixed deadlines and space restrictions. All papers are reviewed by an independent expert referee, the guest editor, and the principal editor. This procedure ensures quality and gives them all-important 'peer-reviewed' standing with those ever-watchful bean-counters.

Principal editors have an important role in defining the style and content of *Elements*, and in ensuring that articles are pitched at the right level. Authors will find that this is not easy. While we do not aspire to be available to a mass audience like the excellent *Scientific American*, we want to publish papers accessible not only to members of the supporting societies, but also to students, to scientists in adjacent disciplines and to popular science writers and policy makers. Writing for a wider audience means taking off the comfortable old jacket of jargon, buzzwords, acronyms, and notations that we all wear for our technical writing, and putting on something smarter and more outgoing. It's worth the effort—what you write for *Elements* is likely to be read by a far larger audience than even your most-cited technical paper.

Ian Parsons

Thank you very much for the excellent first issue of *Elements*. The choice of theme was excellent, and the articles were very well done. I felt the level of detail was just right for the target audiences described in the inital editorial, "*Elements*: Building a New Bridge". The quality of the production and especially the graphics were outstanding. The authors and all the editorial staff are to be congratulated on a first rate production. If you "will get better and better", my mouth is watering.

Mark J. Logsdon, Geochimica Inc., USA

I arrived back from AGU to find the first issue of *Elements* in my mailbox. What a great first issue! The issue is packed with information, the articles an exciting mix of data, facts, and description of the "state of the field" as it is now. If you go upwards from here, and I am sure that you will, *Elements* will rapidly become a seminally important journal. What a great improvement over the much-too-dry society newsletters (and I know whereof I speak, having produced some of those dry *Geochemical Society Newsletters* in early 1990s!). To mix all that society information with exciting science and to make it available to the seven societies is a masterstroke. My congratulations to all involved in this new journal.

Steven B. Shirey, Carnegie Institution of Washington, USA

The inaugural issue of *Elements* is excellent! My only critique is that the four columns per page used in a couple of items was distracting (and difficult to read because too many rapid eye motions are required). I think two columns per page is best looking and easiest to read. Otherwise, congratulations on a well-designed layout and high-quality content.

Neil Sturchio, University of Illinois at Chicago, USA

It is just great. The color figures are quite nice and helpful for the readers to understand the papers. All figures should be with color if possible. The problem here in Japan is that few students are members of MSA, GS, and so on. They cannot read *Elements*. Copies should be delivered to university libraries so that they have a chance to read *Elements*.

Takashi Murakami, University of Tokyo, Japan

Wow, what a fantastic magazine. For the first time in months if not years, I can see myself reading a magazine from cover to cover. Congratulations on a job well done!

Gregory M. Dipple, University of British Columbia, Canada

In general I heartily approve, although I will definitely miss Canadian-locality articles like Dan Kontak's in the recent MAC Newsletter. I have two suggestions, one positive and one negative; on the positive side: continue the "2005 Preview" page as a rolling item—lets get them anticipating things. On the negative, discontinue the use of bold text for initial figure references; it breaks up the flow of the text since one automatically goes to look to see what was so important.

Douglas Scott, Timmins, Ontario, Canada

I know you all worked really hard on *Elements*, from developing the concept to the final product and it really shows! Really, really good! If we can keep the momentum, I cannot see why *Elements* should not be a sizable force in improving the profile of our fields! Thanks for your hard work.

Susan L. Svane Stipp, University of Copenhagen, Denmark

NOTE FROM THE EDITORS: We are happy to share some of the "flowers" we received following the inaugural issue of *Elements*. Several suggestions from our readers are implemented in this issue or will be in future issues.

The managing editor received real flowers from her fellow editors to celebrate the launch of *Elements* at the GSA meeting. PHOTO BARBARA DUTROW.

I am very impressed! I enjoyed the scientific articles, and I think that the way you laid it out, with a couple of pages for each member society's "news", works very well. I am looking forward to subsequent issues! Congratulations on a great new geoscience magazine! And best wishes for its successful future.

Sandra Barr, President,
Geological Association of Canada

I have just received (and read) the first issue of *Elements*. What a brilliant publication! It really does illustrate how relevant mineralogy and geochemistry are and in a manner that is completely accessible. Congratulations! I will look forward to the next issue on diamonds.

Philippa Black, University of Auckland, New Zealand

My congratulations to you and the rest of the editorial group. I'm very pleased and excited that the societies have a common forum for timely technical and society news. I have two suggestions: (1) Include a section on new web pages that include recent URLs for special reports, technical summaries, activities etc. I suggest you solicit these from readers who want to promote their web-based compilations, typically submitted by individuals and non-profit organizations. (2) Highlight a special graphic from a society member at the very end of the issue. The graphic choice should be selected on aesthetics and not necessarily on technical quality… just a pretty picture. It could include photos of real minerals, molecular models of minerals, phase diagrams, TEM, SEM photomicrographs, field images, etc. Label them "Parting Shot", "Geoimage", "Last Glimpse" etc.

Randall T. Cygan, Sandia National Laboratories, USA

IN THE NEXT ISSUE, READ ABOUT

Genesis: Rocks, Minerals, and the Geochemical Origin of Life

Robert M. Hazen, Guest Editor

Few scientific questions so capture the public imagination, or provoke such lively debate, as how life on Earth emerged. In the next issue of *Elements*, four of the most creative minds in origins research present their original insights on the geochemical origins of life. Each author has studied the field in depth, and each has come to an inescapable conclusion: rocks and minerals must have played a pivotal role in the transition from the blasted, prebiotic Earth to the living world we now inhabit. Rocks and minerals catalyzed the synthesis of key biomolecules; they selected, protected and concentrated those molecules; they jump-started metabolism; and they may even have acted as life's first genetic system.

Rocks and minerals as protective environments for life's origin
JOSEPH V. SMITH (University of Chicago)

Minerals and the assembly of biopolymers
JAMES P. FERRIS (Rensselaer Polytechnic Institute)

The geochemical evolution of metabolism
GEORGE D. CODY (Geophysical Laboratory)

Sketches for a mineral genetic material
A. GRAHAM CAIRNS-SMITH (University of Glasgow)

COMING UP

IN SEPTEMBER Toxic Metals: Role of Surfaces

IN DECEMBER Large Igneous Provinces and Environmental Change

Science Societies and the Democratic Process

Peter J. Heaney[1]

After Ed Koch was elected mayor of New York City in 1978, he used to stop people on the street and ask, "How am I doing?" This act of populism charmed even the most cynical New Yorkers, who returned him to office for two additional terms.

It's a lot harder to gauge the happiness of your constituency if you work for a scientific society. There are no newspapers that editorialize on the latest initiatives of the Geochemical Society (GS), and cable news completely ignores the adventures of the Mineralogical Association of Canada (MAC). Instead, one is left to look at more indirect indicators. Is the total membership growing or declining? Do the publications attract cutting-edge articles that are widely cited? Are the scientists engaged in society affairs?

To weigh this last question, we can ask another: How many scientists take the 10 minutes required to read the biographical statements of candidates for society positions, check the boxes next to the ones they like, and mail in the pre-addressed envelopes? George Will, political commentator for *Newsweek*, has argued that electorate turnout is a most imperfect measure of voter satisfaction; non-voters may be so at ease with the status quo that their absence should not be construed as discontent. On the other hand, I would note that (a) George Will is wrong about most things; and (b) these are not two-dimensional television personalities who are running for office but our friends and colleagues with whom we went to school and whom we meet at conferences.

I wrote to the presidents of five of the societies that sponsor *Elements* to find out how their leadership is chosen. All responded immediately, and I learned something that surprised me. Only the Mineralogical Society of America offers elections that are actually democratic, meaning that there are more candidates than positions to be filled. The other societies are not in constitutional violation. By-laws for most of the societies are available on the web. Of the five societies polled, MSA alone explicitly requires that its elections shall be contested: "For Councilors there shall be at least twice as many nominees as there are open positions, and there shall be two nominees for Vice President."

This situation provokes a thought: How much democracy do we really need in our scientific societies? Even though MSA calls for contested elections, history shows that most of the membership does not take advantage of that privilege. Alex Speer, Executive Director of MSA, provided me with a list of voter participation going back to 1925. Over the last 10 years, voting rates have averaged only 27%, with a range of 23 to 29%. Interestingly, these figures are consistent with those of the 1930s through the 1950s. The late 1960s and early 1970s saw a surge in the percentage of returned ballots, coincident with slight increases in the levels of membership (in 1971, for example, 41% of 2,674 members voted).

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What does it mean when only a quarter of eligible voters cast a ballot? Is MSA structured so adeptly to represent its citizenry that the particulars of the people in the top offices are immaterial? Or does the MSA Council make decisions that are so irrelevant to life's daily routine that the majority of the membership can happily detach from the political process? No one involved in the running of MSA is arrogant enough to assume that the former is true, but neither is the latter. For example, the society is spearheading the development of GeoScienceWorld, which will permit electronic publishing of *American Mineralogist* and the *RiMG* volumes as well as allow full-text web searching on any given topic, and this is exactly the kind of contribution that flies completely below the radar of most members (until they find themselves using it).

"How much democracy do we really need in our scientific societies?"

"What's beautiful about democratic science societies is also what's terrible about them: they are as successful or as ineffective as the people who participate."

It also seems important to note that the period of maximum voter participation coincided with the heady days of the lunar exploration program, when mineralogy, petrology, and geochemistry had a cachet that is less evident in this post-Apollo landscape. One can only conclude that today's anemic voter participation reflects a lack of investment in the direction that MSA is following. That's too bad, because these societies belong as much to the first-year graduate student trying to make sense of Schreinemaker's rule as to the latest winner of the Roebling medal.

And what of the other societies that do not offer even the committed 25% an opportunity to select among multiple candidates for office? Initially, the democrat in me responded to this potential for cronyism with outrage. After all, societies make decisions that can affect some lives pretty profoundly; they all designate the organizers and locations of international meetings, and they all present prestigious awards that can make or cap a career.

But conversations with representatives of those societies have moderated my indignation. The smaller organizations, with their limited membership, sometimes struggle to convince members to add the burdens of office to their already overloaded schedules. In addition, a lack of democracy can paradoxically allow for fairer representation. Though members of MSA are unambiguously committed to gender diversity (no female candidates for office have ever lost), they apparently are more ambivalent regarding international representation (7 of the last 9 foreign candidates for Council have been defeated, despite the fact that roughly half the MSA membership and contributors to *American Mineralogist* are based outside the US). Conversely, MAC explicitly searches for one representative from each of the geographic regions of Canada (as well as one from the US), and GS requires that at least two of its directors reside outside the US.

These are complicated issues, and the purpose of this column is not to moralize. But if you're feeling disenfranchised, you can change that. If you belong to MSA, you can vote. If you belong to the other societies, you can read the by-laws. They may not require multiple candidates, but they don't prohibit them either. And they all have mechanisms to allow non-council members to put up nominees. What's beautiful about democratic science societies is also what's terrible about them: they are as successful or as ineffective as the people who participate.

Paul Ribbe and the Reviews in Mineralogy

"Before and after" the Reviews in Mineralogy! On the left, the picture Paul Ribbe submitted to the University of Cambridge as part of his application in 1959. On the right, Paul enjoying well-earned retirement from editing the RiMG volumes for 30 years.

Paul Ribbe retired from the Series Editor position of the Mineralogical Society of America in 2003, after editing 50 RiMG volumes and five monographs over the past 30 years. This stunning achievement was recognized at the recent meeting of the Geological Society of America, where a special symposium was held in his honor. We gladly accepted his offer to write a brief history of the Reviews in Mineralogy.

Professor Emeritus of Mineralogy at Virginia Tech, Paul served as president of MSA in 1986 and 1987 and was awarded the Distinguished Public Service Medal by MSA in 1993 for his work with the Reviews in Mineralogy. He suspects that he was presented the 1995 Mineralogical Society of Great Britain and Ireland Schlumberger Award for the same undertaking. Paul retired from Virginia Tech in 1996 after 30 years. He and his wife, Elna, live contentedly in Blacksburg, Virginia, where both are heavily involved in Christian ministries.

A BRIEF HISTORY OF MSA'S REVIEWS IN MINERALOGY:

FROM MANHATTAN TO THE MOON

Paul H. Ribbe

Alcohol-Soluble Short Course Notes

In the beginning, short courses of mineralogical interest were intended to be held in conjunction with the annual meetings of the Geological Society of America and affiliated societies. Sponsored by the American Geological Institute's Council on Education and directed by Joseph V. Smith, the first short course, *Feldspars*, was held November 1–3, 1965. Notes were produced for the 90 participants by Joe Smith, David Stewart, and myself using state-of-the-art Ditto-Master technology. Tragedy struck when a bottle of Scotch being smuggled in Dave's briefcase into dry Manhattan, Kansas, broke, smearing or completely dissolving the purple ink from most of his handouts. A surviving fragrant fragment reads: "A discussion of what needs to be known in comparison with what might be determined will be given at the beginning of the lecture." Auspicious beginning!

AGI's Mimeographed Notes

In subsequent years, courses entitled *Pyroxenes and Amphiboles*, *Sheet Silicates*, and *Resonance Spectroscopy* were presented. Lecturers expanded their short course notes into longer chapters. These were mimeographed and compiled in ever-thicker binders for circulation by AGI, which coincidentally (?) ran out of funding for the project in 1968.

MSA's Short Course Notes

Five years passed before J.V. Smith, President of MSA, surveyed the members about the desirability of reviving the short course idea. Thus in 1973 the MSA Councilors appointed a committee to initiate the project that continues to this day. The first of 48 "modern" courses was held the following year with Charlie Prewitt directing. *Sulfide Mineralogy*, a 284-page book, with six authors and six chapters—Short Course Notes, Volume 1—was produced under my editorship in time for presentation at the Miami GSA. (Interestingly, *Sulfides* went through four printings and sold 7600 copies, more than any other single volume.) Three more volumes appeared in subsequent years, with increasing difficulty of scheduling and quality control. Thus, in 1978 Council asked me to assume the role of Series Editor.

Reviews in Mineralogy and the Science Citation Index

In 1980 two significant events took place: MSA changed the name of Short Course Notes to Reviews in Mineralogy and the Institute for Scientific Information asked for permission to reference RiM papers (chapters) in their *Journal of Citation Reports*. Listings in JCR and *Current Contents* since 1984 have helped establish the RiM volumes as significant players in the scientific literature, simultaneously satisfying promotion-and-tenure "bean counters" who insist on knowing the number of citations an author's papers receive in a given year. Furthermore, RiM and RiMG have been provided since 1987 to all libraries that subscribe to *American Mineralogist*, making them accessible to a worldwide audience. (Then there were 1300+ library subscribers, now there are 790.)

Before 1984, all 12 volumes had been typed on an IBM Selectric (5000 pages by one person—Margie Sentelle), pasted up, and submitted as camera-ready manuscripts to the printer. Ed Roedder's *Fluid Inclusions*, our first monograph, moved us into the era of word processors, at which time the average number of pages per volume jumped from 430 to 530. By the late 1990s, size was becoming a problem for paperbound volumes. The average cover-to-cover distance was 630 pages, with the apogee at 1037 pages (*Planetary Materials*). In 1989, the second edition of Volume 2, *Feldspar Mineralogy*, appeared in a Chinese translation, and in 1992 Roedder's *Fluid Inclusions* was published in Russian.

Reviews in Mineralogy and Geochemistry

In the year preceding 2000, MSA, led by Executive Director Alex Speer, and the Geochemical Society, led by President Mike Hochella, negotiated a change of name for the Reviews series: RiM became RiMG—Reviews in Mineralogy and Geochemistry. Jodi Junta Rosso was appointed Series Editor for the Geochemical Society's volumes. The new title better reflected what had been the case for at least 15 years and expanded our horizons significantly.

In 2000, Volume 39 *Transformation Processes in Minerals* became the first RiMG book. The accompanying short course was convened in Cambridge, England—the first outside the continental USA. That year, 1565 pages (3 volumes) were published—not all that remarkable. In 2001—the year the Department of Energy began generous support of student scholarships for select short courses—there were 2196 pages (4 volumes), and in 2002, 3775 (6 volumes!). As editor, I was beginning to feel like a full-time employee of the Society,

even though Jodi Rosso had assisted with several volumes and edited 2.5 of the 13. With my wife's gentle encouragement, I retired, knowing that Jodi would accept the job of Series Editor for both GS and MSA beginning with Volume 54.

RiMG in Cyberspace

By 2003 MSA had joined GSW (GeoScience World), an aggregate of Earth science societies bonded together to market their electronic publications, all of which are designed to exploit the search capabilities of AGI's GeoRef.

Although the means of individual access to RiMG has not yet been determined, the five volumes printed in 2003 and 2004 are already online through GSW, thanks to Jodi and Alex. The plan is to continue electronic publication of RiMG and in the near future to post volumes dating back to 2000 and earlier.

RiMG in Orbit?

The next volume to appear will be Volume 57 *A New View of the Moon* to be published in cooperation with NASA.

Conclusion

It would be false modesty to underestimate the impact on the disciplines of mineralogy, petrology, and geochemistry of the work of 963 different authors of 716 chapters (30,314 pages) in 56 volumes. For the curious: the entire series occupies nearly 6 feet (1.8 m) of shelf space and weighs 103 pounds (46.8 kg). More than 170,000 books have been sold to individuals over 30 years; about 40,000 are in libraries, and more than 42,000 are in inventory. Now that the number of books in print has exceeded the number of miles from Manhattan to the Moon, RiMG would appear to have a solar if not a stellar future.

Looking Forward to the Past: A Session in Honor of Paul Ribbe and the Reviews in Mineralogy and Geochemistry

Mineralogists young and old from all over the world gathered in Denver last November, at the annual meeting of the Geological Society of America, to contribute to a session in honor of Paul Ribbe. The title of the session reflected the fact that, as reviewed by Michael Hochella (Virginia Tech), Paul Ribbe's career as a teacher and researcher in mineralogy became so intertwined with the development of the Reviews volumes that it is difficult to separate one from the other.

The session was opened by Michael Carpenter (Cambridge), with a picture of Paul Ribbe (reproduced here) that Paul had submitted as part of his application to the University of Cambridge back in 1959. At Cambridge, Paul determined the crystal structures of several feldspars and was the first to show that the structure of low albite had an effectively fully ordered distribution of Al and Si atoms. Throughout Paul's career, the underlying theme of his feldspar research was the connection between the details of the crystal structures at the atomic level and their macroscopic thermodynamic properties and lattice parameters. This was emphasized in a review by Ross Angel (Virginia Tech) of high-pressure crystallographic studies of feldspars that have been made since the feldspar RiM volume was last revised in 1982, and by Ian Parsons (Edinburgh) who discussed the fascinating exsolution microtextures in perthites from the Klokken intrusion, which can only be understood in terms of the coupling between ordering and un-mixing within the feldspars.

The other early volumes in the Short Course Notes series were also devoted to specific mineral groups and built on the same "micro to macro" theme that was to become the subject of a later RiM volume in its own right. Progress in understanding bonding in sulfides through high-pressure crystallographic studies was reviewed by Charlie Prewitt (University of Arizona), a contributor to that first sulfides volume. "Changing Perspectives" was the very apt title chosen by David Vaughan (University of Manchester) for his presentation that emphasized both the development of studies of the *interactions* of sulfide minerals and the environment over the last 30 years, and the novel experimental tools that have been developed to enable those studies. Having started as critical reviews of the structures and properties of specific mineral groups, the RiM volumes have evolved over the years to encompass "even petrology", as noted by Darrell Henry (Louisiana State) in his talk on Ti in biotite, as well as experimental techniques. Robert Bodnar (Virginia Tech) took up his theme in reviewing the progress in fluid inclusion research since the publication of the only single-authored volume in the RiM series—volume 12 by Edwin Roedder. Novel computational methods have also revolutionized mineralogy on all scales from bonding in minerals (Jerry Gibbs, Virginia Tech) and molecular interactions (Jim Kubicki, Penn State) to km-scale modeling of metamorphism (Barb Dutrow, Louisiana State).

The last part of the session returned to the theme introduced by David Vaughan, that of mineralogy being an integrated study of the interaction of minerals with their environment. Mickey Gunter (University of Idaho) discussed the health issues arising from mineral dusts. Patricia Dove (Virginia Tech), editor of the recent RiMG volume on biomineralization, reviewed the incredible structures built by various organisms out of calcite that must reflect some "vital" or biological effect. Both she and Jill Pasteris (St. Louis) also emphasized the importance of quantifying such effects so as to be able to use the compositions of biominerals as a proxy for the environment in which the organisms originally lived. Bob Hazen (Carnegie Institution of Washington) looked back to the origin of life and the problem of understanding how life's essential molecules, such as amino acids and sugars, became handed or "chiral." He suggested that chiral mineral surfaces may have played a key role in separating left- from right-handed molecules or in catalyzing chiral synthesis reactions. And he looked forward to the exciting new experimental techniques, borrowed from biochemistry, that are starting to be used to characterize the interactions between mineral surfaces and biomolecules. Bob Downs (University of Arizona) looked even farther forward with his presentation of a recently developed hand-held Raman spectrometer that was straight out of Star Trek!

The breadth of the talks and posters in the session emphasized the influence of the RiM volumes on the careers and thinking of most mineralogists. Jim Kubicki (Penn State) reflected the feelings of many in saying that being asked to edit a RiM volume was one of the highest honors he had received in his career. Several speakers concluded their talks with either news of forthcoming volumes in the series or informal proposals for new volumes, clearly demonstrating that the series Paul Ribbe founded and developed over thirty years remains a vital endeavor and a valuable resource for mineralogists. While all participants at the session expressed their thanks in various ways to Paul Ribbe for his service to the mineralogy community and for his incredible patience with authors and editors, the last slide of Bob Hazen's talk said it best. It simply read, in large friendly letters, "Thank you Paul".

Ross Angel and Nancy Ross
Virginia Tech
Blacksburg, November 2004

International Gemmological Conference, Wuhan, China

The 29th International Gemmological Conference (IGC) was held at the China University of Geosciences in Wuhan, China, September 13–17, 2004. The conference, founded in 1951 by Dr. Edouard Gübelin and a number of his fellows, is designed to bring together professional research gemmologists worldwide to discuss the latest developments in gemmological research and other items of gemmological interest. It is held every two years, in the odd years, and usually alternates between venues in Europe and the other continents. The 29th conference was deferred until 2004 because of the SARS scare in China in 2003.

Attendance is by invitation and is limited to two delegates per country (though there may be extra observers). The 29th IGC welcomed delegates from Australia, Bahrain, Canada, China, Czech Republic, Germany, Holland, India, Indonesia, Japan, Korea, Russia, Singapore, Spain, Sri Lanka, Switzerland, Taiwan, Thailand, UK, and USA.

Delegates to the conference are expected to deliver papers on their current research. Papers given at the 29th session covered such diverse topics as "Study of Crystal Defects in Synthetic Diamond with Synchrotron Radiation X-ray Diffraction Topography" (Dr. Chen Tao) and "Trace-element geochemistry of gem corundum from various gem fields of Madagascar" (Dr. T. Thanasuthipitak). Willow Wight, research associate at the Canadian Museum of Nature and editor of the *Canadian Gemmologist*, spoke on her recent work on the non-nacreous pearls of *Placopecten magellanicus* scallops from Digby, Nova Scotia, Canada.

The Mengyin diamond mine, China

Although the conference itself lasts for one week, there are both pre- and post-conference tours. For the 29th session, the pre-conference tour included the Jurong Shi pearl farms and the Ma'anshan turquoise mine. The post-conference tours covered the Changle sapphire deposits, the Mengyin diamond mine, and the Damaping peridot mine.

The Ma'anshan turquoise mine lies some 30 km southwest of the city of Nanjing. Turquoise was discovered here in the 1960s as a result of examination of iron deposits in a Mesozoic volcanic sequence. The major item of interest during our visit was a single, 20-tonne slab of turquoise that had just been mined and was being crated for shipment.

After the conference, we flew to Jinan and drove from there to Changle, 150 km to the east. Sapphire occurs in Changle county in two types of deposit. Primary sapphires are obtained as megacrysts in specific layers in alkalic basalts 16–17 million years in age; secondary sapphires are recovered from ancient stream beds buried beneath 10–12 metres of alluvial soil. The sapphire-producing area covers 420 km^2, and is basically agricultural.

The Mengyin diamond mine is also some 150 km from Jinan, to the south-east. Diamonds were discovered here in 1965, and subsequent exploration located the kimberlite (micaceous peridotite) pipes and veins. The age of the kimberlite intrusion is estimated at around 80 million years, although the diamonds themselves are probably more than 450 million years old.

Sorting diamonds by hand

Mining first took place as an open-pit operation, but the work went underground in 2001 and now reaches a depth of 210 metres. The kimberlite "carrot" divided at depth, and reached the surface as two separate entities, the larger of which is 75 × 45 metres, and the smaller 75 × 20 metres. The smaller pipe is the more productive of the two. The kimberlite, apparently controlled in a NE to NW fan by the Tanlu fault, also occurs in small veins that are generally short (10–100 metres) and range in width from 0.5 to 2 metres. Other exposures are known in the area.

The mine produces an average of 300 carats per day, for an annual gross of 100,000 carats, 20% of which are gem quality. On the day of our arrival, they had already found 800 carats, much to the delight of the mine manager, who insisted that we had brought them luck. The primary habit is octahedral, and the colours range from black through brown and yellow to completely colourless. A tiny percentage of very small crystals are pink, but no blue diamonds have been seen to date. The largest diamond recovered from the area (in 1977) was a 158.79-carat yellowish crystal. The largest one found directly in the pipe was a 119.01-carat rounded octahedron (in 1983).

The mine shaft and buildings are at the edge of a small village and, apart from the incredible noise, have a very casual air about them. Ore brought from the shaft first goes through a jaw crusher, then a cone crusher, before being delivered to the grease belts. The fines recovered from the grease are sorted by hand by five or six very sharp-eyed young women who can spot a diamond of infinitesimal size with ease.

In the crushing house, the noise is deafening, there is water everywhere, and the entire building vibrates. In fact, it may be vibrating to pieces: there were holes in the walls. Interestingly, two-thousand-year-old technology works well. The crushed material is moved to an upper level by a huge Archimedes screw.

The final stop on the tour (besides the Great Wall, which is *de rigueur* for everyone) followed a flight to Beijing and a 240-km drive northwest from there to Zhangjiakou. The Damaping peridot mine is a further 30 km north of Zhangjiakou, in a series of Miocene alkaline basalt flows. As in Changle, there are alluvial and in situ deposits. One area of the hillside on the long climb up to the mine appears to be covered by fine, green peridot sand. The peridot is essentially 90% forsterite. Development in the area is slowing because of weaker markets, but the resources have not been exhausted.

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