



News from the IMA

The International Mineralogical Association (IMA) was founded in 1958 and is supported by 34 national mineralogical organizations worldwide. News of its activities will become a regular feature of *Elements*. Communication during the four-year interval between its main scientific meetings has always presented a problem for IMA, and *Elements* presents a historic opportunity to make our activities visible to the international membership.

Following IMA Business Meetings at the recent International Geological Congress in Florence, we can announce several developments:

Following a year-long competition, IMA Council has chosen a logo.

IMA now has its own domain name www.ima-mineralogy.org. A much enlarged website, which includes IMA news and links to websites of supporting organizations, is now online.

IMA 2006 will be held from 23 to 28 July, in Kobe, Japan. Visit www.congre.co.jp/ima2006/

IMA 2010 will be held in Budapest under the chairmanship of Prof. Ekkehart Tillmans of Austria.

Finally we are delighted to welcome into the IMA the national mineralogical society of Uzbekistan.



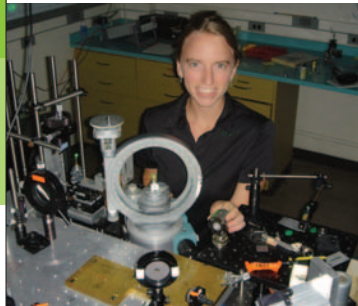
Ian Parsons,
President of IMA

ADVERTISERS IN THIS ISSUE

Excalibur	6
HORIBA Jobin Yvon	8
Hudson Institute of Mineralogy	12
JEOL	Inside cover
Rocks and Minerals	18
Rockware	Back cover

Special thanks to HORIBA Jobin Yvon for sponsoring eight additional pages in this issue.

NOTE FROM THE EDITORS:
We will regularly publish short news items on people. We rely on you to send news about your colleagues and about yourself.



Jennifer Jackson in her lab

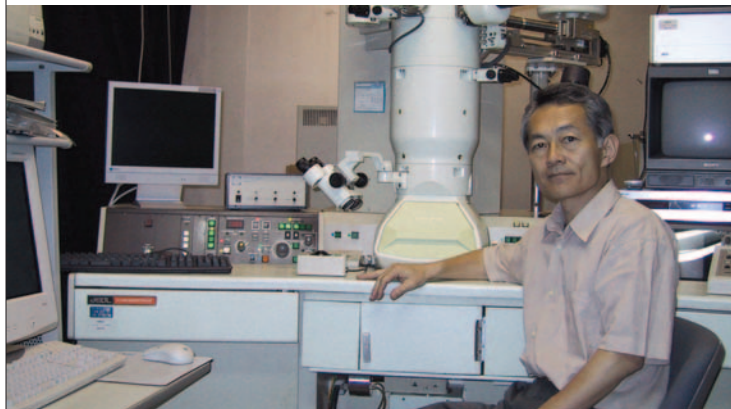
JOHN C. JAMIESON AWARD TO JACKSON

In the summer of 2004, Jennifer Jackson received the John C. Jamieson Award at the Gordon Conference on Research at High-Pressure for her excellent contribution to the field of high-pressure science. She also received the Harriet Wallace Award for being an outstanding woman geoscientist in the Department of Geology at the University of Illinois, Champaign-Urbana, where she is finishing her PhD in the area of deep-Earth mineral physics. Her research interests are focused around the large-scale behavior of planetary interiors through direct examination of mineral properties under extreme conditions of pressure and temperature. She uses Brillouin spectroscopy and diamond anvil cells to measure the sound velocities of minerals under high pressure.

MINERALOGICAL SOCIETY OF JAPAN AWARD TO MURAKAMI

Professor Takashi Murakami received the Mineralogical Society of Japan Award, the highest award bestowed by the Society for scientific eminence as represented primarily by scientific publication of outstanding original research in mineralogy. It has been awarded since 1995. Previous winners include Masao Kitamura (Kyoto University) in 1995, Izumi Nakai (Tokyo University of Sciences) and Jyunji Akai (Niigata University) in 2002, Kazushige Tomeoka (Kobe University) and Katsuyuki Kawamura (Tokyo Institute of Technology) in 2003.

Takashi Murakami is professor of mineralogy at the University of Tokyo. He is interested in the fundamental processes, kinetics, and mechanisms of mineral-water-atmosphere interactions at the Earth's surface. His main research programs are: 1) laboratory and field experiments of dissolution and weathering of silicate minerals and the effects of dissolution and weathering on element transport, and 2) Precambrian weathering and its relation to atmospheric carbon dioxide and oxygen evolution. He teaches mineralogy for undergraduates and environmental mineralogy at the graduate level.



Professor Takashi Murakami working on the TEM



International Mineralogical Association

FROM THE PRESIDENT

The arrival of *Elements* on the mineralogy–geochemistry scene presents IMA with an unprecedented opportunity to reach its members and provides a means for its members to communicate with each other. Of course, by no means all members of IMA are members of the current group of societies supporting *Elements*, but most will be able to see the magazine through their institutional subscription to one of the technical journals produced by the consortium. The editors of *Elements* hope that other societies, particularly from countries where English is not the main language, will join and make use of the opportunities for widening communication that *Elements* offers. Like the predominantly English-speaking founding group, they can use *Elements* as a pointer to their national, own-language website to provide detailed information to members.

IMA is supported by small subscriptions, based on membership, from 37 mineralogical organizations, the largest with more than one thousand members, the smallest with less than ten. The oldest of these national mineralogical societies were founded in the early second half of the nineteenth century when many of the important mineral species were being established on the basis of crystal morphology and physical properties, a time when analytical chemistry was extremely primitive. The newer science of geochemistry grew up in a world in which travel and communication were more developed, and most geochemical organizations had an international character from the outset. The IMA was founded to improve contact between its historically fragmented members. Its best known activities are its quadrennial general meetings, the next in Kobe, Japan, in 2006, and the work of its Commission on New Minerals and Mineral Names. Its commissions and working groups regularly sponsor or organize

sessions at other meetings, such as the recent International Geological Congress in Florence and the forthcoming Goldschmidt Conference in Moscow, Idaho, and many of these lead to special publications or thematic journal issues. IMA has a new website (ima-mineralogy.org), which can connect you to each of the member organizations.

So, do we need an IMA, and can it do its job more effectively? We certainly need an international organization as a focus for the worldwide activities of mineralogists. The word 'international' in the title is essential to raise travel funds in many countries where science is less well developed. But our quadrennial meetings have been nothing like as successful as the annual geochemical Goldschmidt meetings, which often attract more than twice the number of delegates, even though the scientific territory the two organizations cover is a continuous solid solution. I fear that one reason for this is the current scientific dominance of an English-speaking world, whose members see the 'I' in IMA (or, for that matter, IGC) as implying that participants will have to sit through large numbers of lectures delivered in less than perfect English. If this influences your choice of annual big meeting, I can only suggest that the greater gains for mankind of a truly international scientific community is a factor you should consider, even if it entails a little extra effort.

IMA has long suffered from lack of a communications channel. *Elements* gives us the opportunity to be regularly in the public eye, and we will provide news of the activities of commissions and of

meetings in which we are involved. My personal view (not shared, I should say, by all members of Council) is that the IMA is bureaucratic out of all proportion to its modest size. The members of commissions are chosen as representatives of the supporting societies rather than for their scientific standing or ability to inspire. I think they would do a better job if composed of like-minded experts and enthusiasts in each field, and if they were responsible for their own membership. Commissions would not be required to involve every national organization, but would have the duty to serve the whole community. Their membership would be subject to the approval of Council, which would ensure that the international community was represented as widely as possible.

Running IMA is not easy. Many of the problems fall on the shoulders of our hard-working secretary, Maryse Ohnenstetter, and dogged treasurer, Kase Klein. It is frequently difficult to get answers from national representatives and even from chairs of commissions. No less than 10 out of 37 member organizations are currently behind with payment of dues for 2004 (some for several years). So let me end with a rallying call to you, the mineralogists who own IMA: it is only going to be as effective as you make it. Come to the Kobe meeting, support the work of the commissions and working groups, do your bit for mineralogy international!

Ian Parsons, President of IMA,
2002–2006

ADVERTISERS IN THIS ISSUE

Environmental Isotope Laboratory	64
Excalibur Mineral Corporation	65, 90
Gemological Institute of America	66, 104
HORIBA Jobin Yvon	Inside front cover
Hudson Institute of Mineralogy	109
Meiji America	128
Rigaku	65, 121, 127
Rockware	Inside back cover, back cover
SGS Lakefield Research	65
Universität Bayreuth	89



NEW MINERALS: HELP OR HINDRANCE?

The Commission on New Minerals and Mineral Names (CNMMN) was established at nearly the same time as the IMA, in 1959, for the purpose of controlling the introduction of new minerals and mineral names and of rationalizing mineral nomenclature. In the 45 years of its existence, the CNMMN has not been idle, judging from the list of 4000 or so minerals and mineral names on which the CNMMN has officially taken a decision on their approval, discreditation, and/or redefinition (available on the CNMMN website: www.geo.vu.nl/~ima-cnmmn). On this website one can also consult the procedures and guidelines for proposing new minerals and mineral names, and nomenclature reports published by the CNMMN.

On average about 80 new minerals are proposed each year, and about 60 of these are approved. Some persons consider the work on new natural phases as wasted time. Who indeed cares about these tiny and exotic grains? Why should one spend precious lab and personnel resources on the umpteenth arsenate, phosphate, or sulfate in some forsaken oxidation zone of an unimportant, abandoned ore deposit? Of course, a new substance has to be characterized first before it becomes clear whether it is an "exotic butterfly" or an important technical substance. The conclusive answer to these questions and considerations was given by one of my predecessors as CNMMN chairman, Akira Kato, at the start of the Paris 1980 IGC session on new minerals: "Once upon a time, feldspar was a new mineral!"

It so happens that in 2004 the CNMMN received not one, not two, but three proposals for new minerals in the feldspar group. Two of these have been approved: the hexagonal potassium feldspar kokchetavite and the not-yet-published tetragonal polymorph of albite. In both cases, these submicroscopic grains of new minerals have given important information on the genetic history of the rocks in which they were found. In the same year, the CNMMN also received proposals for new minerals in other common rock-forming mineral groups: five amphiboles, three micas, and even a new polymorph of quartz, named seiferite. Taking great pains on the full characterization of new minerals is obviously not always a waste of time, but a real help.

However, not only scientific aspects of these phases are important; appearances also count, especially for the large body of amateur mineralogists and mineral collectors. Some new minerals are a feast for the eyes, as you can see from the accompanying photographs of the Sb–Mo oxide biehllite (99-019) and a not-yet-published Na–Cu carbonate (2004-036). The ultimate in this category is of course the recent discovery in Madagascar of the whitish-pink to raspberry-red pezzottaite, a caesium mineral related to the beryl group. Gem-quality specimens of this new mineral (2003-022) have changed hands for six-figure prices!

The path of the CNMMN is not always strewn with roses. There is regular, heavy criticism on current mineral nomenclature, for example, by John S. White under the title "The Nomenclature Debacle" in the May-June 2004 issue of *Rocks and Minerals*, and by Ralph Kretz in the October 2004 issue of the newsletter of the Mineralogical Association of Canada. I have even been threatened with a global e-mail campaign because the CNMMN does not give unique names for minerals. Just one example: the mineral name 'apatite' does not exist any more—we have nowadays hydroxylapatite, fluorapatite, and chlorapatite, and also

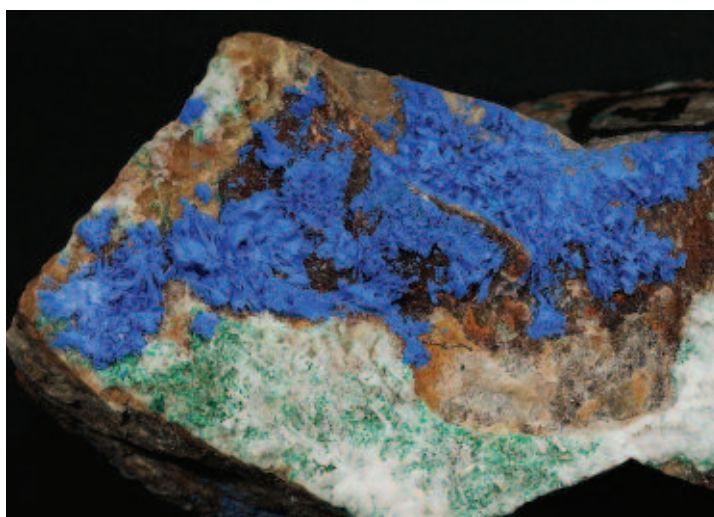
(unjustly) carbonate-fluorapatite and carbonate-hydroxylapatite. How can one give the correct name to an obvious apatite specimen without an analysis of some kind? This problem could have been solved easily by using (optional) suffixes, as has been done successfully in the zeolite and labuntsovite groups.

We all know, of course, that mineralogical nomenclature is far from ideal. There are indeed too many inconsistencies that have arisen before and after the arrival of the CNMMN in 1959. The CNMMN has a so-called 50% rule for nomenclature in (binary) solid solutions, but at the same time there are major mineral groups in which the current nomenclature is not in accordance with this rule (e.g., amphiboles, pyroxenes, pyrochlores,

alunites). The CNMMN is continuously working on nomenclature problems, usually with subcommittees responsible for specific mineral groups or problems. A very peculiar problem, a real hindrance, is caused by the fact that more than 2300 natural phases, possible new minerals but perhaps meanwhile better described elsewhere, have been published without a name. The Subcommittee on Unnamed Minerals (they call themselves SCUM) is taking care of these orphaned objects.

Certainly, for quite some time to come, the CNMMN will not be without things to do!

Ernst A.J. Burke,
CNMMN Chairman
ernst.burke@falw.vu.nl



Two recent new minerals described by a team from the Mineralogical Museum of the University of Hamburg (Jochen Schlüter, senior author). Top: biehllite from Tsumeb, Namibia, width = 15 mm; bottom: 2004-036 from Mina Santa Rosa, Iquique, Chile, width = 28 mm. Photographs by K.-C. Lyncker.



International Mineralogical Association

IMA: MOVING FORWARD

Delegates present at the November 1, 1956, meeting of the Mineralogical Society of America were unanimously in favor of the creation of a committee to examine the possibility of forming an International Union of Mineralogy. The committee was formed early in 1957, with eight members from the US, UK, France, and Germany. The International Mineralogical Association was created shortly after. The

unanimous response of the delegates reflected their desire to present their scientific results at a meeting devoted to mineralogy and to promote mineralogy among the Earth sciences.

The delegates were also unanimously in favor of creating commissions, especially the Commission on New Minerals and Mineral Names (CNMMN), which was aimed at clarifying the nomenclature of minerals. This objective has been pursued since 1957, and as Ernst Burke, current chairman of CNMMN, indicated in the previous issue of *Elements* (June 2005), the CNMMN will still have a lot to do in the future! The Commission on Ore Mineralogy was created three years later, the Commission on Applied Mineralogy in 1979, and most of the other commissions in the 1980s.

All the IMA components have worked hard following the recommendations given at the general meeting of the IMA in Edinburgh, 2002. An increasing number of commissions and working groups are now involved each year in international meetings. In 2003, the IMA sponsored five sessions during the first EGS-AGU-EUG meeting held in Nice. In 2004, the IMA was involved in three large meetings, the 32nd International Geological Congress, in Florence, 20-28 August, where most of the IMA commissions and working groups organized sessions; the 8th International Congress on Applied Mineralogy, ICAM, in Aguas de Lindoia, Brazil, 19-24 September; and the 5th International Conference on Mineralogy and Museums, in Paris, 5-8 September. This year the IMA participated for the first time in the 15th Goldschmidt Conference, in Moscow, Idaho, 20-25 May. Next year the IMA will hold its general meeting in Kobe, Japan, 23-28 July. Takamitsu Yamanaka is the meeting chairman, and the Kobe website can be visited at www.congre.co.jp/ima2006.

Following a change in the Constitution in Edinburgh, the interval between IMA business meetings has been reduced to two years. One meeting coincides with the quadrennial general meeting of IMA, and the second with the International Geological Congress. This change will help to maintain IMA activity between general meetings and facilitate collaboration with other Earth science organizations. The IMA has also made efforts to become more visible among the Earth sciences. The participation of IMA in international meetings has already helped a lot, as has the delivery of information about IMA activities in the *Mineralogical Association of Canada Newsletters* and now *Elements*. The IMA website (www.ima-mineralogy.org) has been revised and now provides links to the websites of supporting mineralogical organizations and information on the activities and membership of commissions. Like most of the international organizations belonging to the IUGS, IMA now has a logo, which was selected from sixteen proposals during the last IGC meeting. The contributors are kindly thanked for their participation.

The scientific activity of the IMA is carried forward by its eight commissions and five working groups, which are now involved in the rejuvenation of their structure and objectives. This was made possible during the Edinburgh General Meeting when Council was given the power to change officers between general meetings. This led to the creation of two new working groups, which were formally recognized during the business meeting in Florence: the Working Group on Environmental Mineralogy and the Working Group on Astromineralogy, chaired by D. Vaughan and F. Rietmeijer, respectively. The two working groups have started with a light structure, as each chairman has selected a small active group, supposed to be reactive enough to give quick answers to the whole community.

Cont'd on p. 243 (bottom)

IMA2006-KOBE

Expansion to Nano, Bio and Planetary Worlds

19th GENERAL MEETING OF THE INTERNATIONAL MINERALOGICAL ASSOCIATION

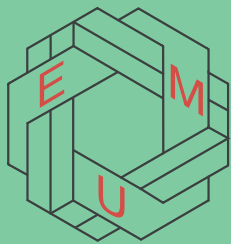
Dates: July 23 (Sun.) - 28 (Fri.), 2006
 Site: International Conference Center Kobe, Kobe, Japan
<http://www.congre.co.jp/ima2006/>

Scientific Sessions:

- Mineral Physics and High Pressure Mineralogy
- Structural Sciences of Minerals
- Crystal Growth
- Hydrothermal Process and Mineralization
- Petrologic Processes
- Planetary Materials
- Environmental and Applied Mineralogy
- Mineral Heritage
- New Frontiers in Mineral Sciences

Deadline for
 abstract submission and advance registration:
February 28, 2006

The second circular is now available for downloading.



European Mineralogical Union



P. Ulmer, President

FROM THE PRESIDENT, PAST PRESIDENT AND SECRETARY

It is with great pleasure that we accept the invitation of the scientific editors and of the Executive Committee of *Elements* for EMU to become one of the societies involved in this exciting new publication. This magazine is already having considerable impact on the Earth and environmental sciences, particularly in highlighting the central role that mineralogy, geochemistry, and petrology play in the development of those broader disciplines.

As further explained below, the European Mineralogical Union (EMU) is an agglomeration of European mineralogical societies, which through its Council and Executive Committee can speak for a large constituency made up of national mineral sciences communities ranging from relatively big to very small. The EMU is also active in promoting the science through its involvement in the organisation of conferences, short courses (or "schools") and related publications, and through journal publication. Our involvement in *Elements* is a great opportunity for us to increase the awareness of the international scientific community in the activities of EMU, and to ensure that our member societies can play a role in this exciting new venture. We are sure that *Elements* will go from strength to strength and look forward to participating in its future.

Peter Ulmer, President
David Vaughan, Past President
Herta Effenberger, Secretary

THE EUROPEAN MINERALOGICAL UNION

The European Mineralogical Union (EMU) was founded in 1987. Its objective is to further European cooperation in the mineralogical sciences (mineralogy, petrology, geochemistry, and their applications). The members of EMU are the national scientific (mineralogical) societies representing mineral scientists from most European countries. At present there are 24 countries represented by their national societies.

IMA: MOVING FORWARD (cont'd from p. 242)

Previously formed working groups, with a structure broadly similar to that of commissions, comprise delegates proposed by the national mineralogical societies and who may not be deeply involved with the scientific development of the working group to which they belong. As an indication of the past low rate of evolution of the IMA structure, none of the IMA working groups was ever transformed into a commission, a process that should normally occur after a few years in the case of an active working group. Some working groups are twenty years old! The efficiency of the two working

group structures will be compared during the next general meeting in Kobe. On the other hand, the Constitution sometimes fails to accommodate some desirable changes. For example, the CNMMN and the CCM (Commission on Classification of Minerals) have planned to merge and have voted to do so, but nothing in the Constitution covers the merging of two commissions. A solution will nevertheless be found and proposed in Kobe. One of them could involve the dissolution of CCM and a corresponding modification of the CNMMN.

The basic principles formulated in the fifties for the creation of the IMA are still valid.

Since that time there have been revolutions in the Earth sciences, with the appearance of new disciplines that contribute greatly to the understanding of our planetary system. However, there is no doubt regarding mineralogy's future, considering its impact on so many aspects of society. To face the future with confidence, a strategic vision plan has to be defined for the IMA. The next general meeting in Kobe (July 23–28) will be the right place to formulate new directions and goals and to provide road maps for the different commissions and working groups.

Maryse Ohnenstetter
Secretary of IMA

Member Countries of the EMU (2005)

Albania, Austria, Belgium, Bulgaria, Croatia, Czech Republic, Denmark, Finland, France, Germany, Great Britain and Ireland, Greece, Hungary, Italy, The Netherlands, Poland, Romania, Russia, Serbia and Montenegro, Slovenia, Spain, Sweden, Switzerland, and Ukraine.

There is no individual membership but individual sponsors are welcome.

Structure and Organisation of EMU

The executive body of EMU is the **Council**, which meets at least once per year. The Council consists of delegates from the member societies. The number of delegates from each society reflects its size. Between Council meetings, the **Executive Committee**, elected for four years, coordinates the work. EMU's main income is from the annual membership fees paid by the national member societies, and these fees are related to the size of the societies.

The Executive Committee of EMU (2004–2008)

PETER ULMER, Zurich (President)

DAVID J. VAUGHAN, Manchester (Past President)

CHRISTIAN CHOPIN, Paris and PURIFICACIÓN FENOLL HACH-ALI, Granada (Vice Presidents)

MARIA FRANCA BRIGATTI, Modena (Treasurer)

HERTA EFFENBERGER, Vienna (Secretary; herta.silvia.effenberger@univie.ac.at)

Main activities of EMU

u The EMU is involved in the organisation and sponsorship of certain European scientific conferences, in particular the biennial series of meetings entitled "Experimental Mineralogy, Petrology and Geochemistry" (EMPG).

u The organisation of short courses ("schools") is a major EMU activity and review volumes that accompany these courses are known as the "EMU Notes in Mineralogy."

u The EMU is involved in the publication of the *European Journal of Mineralogy* (EJM). It helps in the appointment of editors and in the monitoring of the journal's performance.

u A medal for "research excellence" aimed at younger European scientists is awarded annually by the Union.

u An online *Directory of European Institutions* active in research in mineralogy, petrology, and geochemistry is maintained by the EMU.

u The EMU also assists libraries in relevant institutions in central and eastern European countries facing financial difficulties by offering free subscription to the EJM.

u Since 1998, the EMU has been affiliated to the International Union of Geological Sciences (IUGS) and is thus provided with official status as an international scientific organisation.

Further details of EMU activities will be provided in future issues of *Elements*. Background information is available online at www.univie.ac.at/Mineralogie/EMU



www.ima-mineralogy.org

International Mineralogical Association



Richard Hagni

APPLIED MINERALOGY: PRESENT AND PAST

'Applied mineralogy' covers investigations conducted specifically to solve problems related to the physical and chemical characteristics of minerals and materials. It has a vital role in economic activity and human welfare. The investigations are performed using all available mineral characterization techniques and can involve developing or adapting instruments to make the required measurements. Consequently applied mineralogy covers the complete spectrum of mineralogical activity: exploration for, and exploitation of, base metals, precious metals, base minerals, industrial minerals and materials, building and construction minerals, and carbonaceous materials and their by-products in mining, extractive metallurgy, pyrometallurgy, hydrometallurgy and economic geology. It also includes investigations of environmental materials, refractories, ceramics, cements, alloys, and other products, to solve problems related to the environment, health and criminal activities, and to obtain products for the development and building of equipment and structures.

The importance and recognition of applied mineralogy has grown strongly over the last quarter of a century. Although much research was conducted prior to 1979, most of the results remained in the files of industrial firms and were not available to other mineralogists. In the late 1970s and early 1980s, national groups were formed to promote oral presentations and written accounts. The Process Mineralogy Committee of AIME (American Institute for Mining, Metallurgical, and Petroleum Engineers) is one example of a national group devoted to applied mineralogy. The Process Mineralogy Committee sponsored papers at the component SME (formerly Society of Mining Engineers and currently Society for Mining, Metallurgy, and Exploration) and TMS (formerly The Metallurgical Society and currently The Minerals, Metals and Materials Society) meetings beginning in 1979. Other groups devoted to applied mineralogy were begun about that time in South Africa, Germany, Brazil, Argentina, and elsewhere. With the success of those groups, it became recognized that there was a need for an international body to sponsor papers on applied mineralogy.

In 1979 a group of mineralogists approached the IMA with a request to form a Commission on Applied Mineralogy, but the concept was not approved at that time. Consequently, Sybren Hiemstra and Les Houghton of the Council for Mineral Technology (Mintek) in Johannesburg and other applied mineralogists in South Africa organized the International

Council for Applied Mineralogy (ICAM), and held the first International Congress on Applied Mineralogy (also ICAM) meeting in Johannesburg, South Africa, in 1981. Subsequently, the International Mineralogical Association (IMA) organized two sessions on applied mineralogy and initiated the Commission on Applied Mineralogy (CAM), through the efforts of Tony Naldrett, at the 1986 IMA meeting at Stanford, California. Thus, for the past two decades, applied mineralogists have been confronted with the availability of two organizations devoted to applied mineralogy, but with different terms of reference. ICAM congresses are autonomous, with many sessions on applied mineralogy at each meeting, and involve significant numbers of participants in the disciplines of metallurgy and ceramics. CAM meetings are integrated with IMA meetings, and fewer sessions are conducted on applied mineralogy. Beginning with the 1993 ICAM meeting in Freemantle, Australia, the two groups agreed to collaborate further: ICAM would co-sponsor many CAM sessions at the quadrennial IMA meetings, and CAM would sponsor sessions at the ICAM meetings. ICAM agreed to meet on a quadrennial basis half-way between the regular quadrennial IMA meetings. This relationship was reaffirmed by a vote of applied mineralogists at the CAM business meeting at the recent 8th ICAM meeting in Aguas de Lindoia, Brazil, in September 2004.

The scope of applied mineralogy is very broad, and contributions to CAM and ICAM sessions have evolved with time. Early sessions sponsored by the AIME-Process Mineralogy Committee dealt primarily with applications to the field of metallurgy, including mineralogical studies that led to the solution of beneficiation, hydrometallurgical, and pyrometallurgical problems. The first meeting of ICAM dealt with metallurgical materials and with industrial problems related to ceramic materials. The first IMA-CAM meeting dealt primarily with mineralogical studies of problems

in metallurgy and especially with advanced microbeam techniques. Papers were solicited in four areas: mineral and energy materials exploration, mineral materials (including clay minerals), health and environmental mineralogy, and analytical methods. Early CAM sessions at IMA quadrennial meetings have dealt with mineralogical applications to metallurgical, ceramic, mineral exploration, and environmental problems and with the application of advanced microbeam techniques to those and other problems. More recently papers for CAM and ICAM meetings have broadened to include mineralogical applications to the areas of biomineralogy and biomaterials, advanced materials, industrial minerals, gem materials, and cultural heritage.

The field is by its nature interdisciplinary. For example, the application of a wide variety of mineralogical techniques, including reflected and transmitted light microscopy, cathodoluminescence microscopy, X-ray diffraction, SEM, EPMA, image analysis, numerous other microbeam techniques and tomography, to the study of beneficiation, hydrometallurgical, and pyrometallurgical problems involves close collaboration with metallurgists. Using similar techniques, applied mineralogists interact with exploration geologists to facilitate mineral exploration, and the study of other industrial problems may involve specialists such as ceramists, biologists, and environmentalists.

Currently, CAM and/or ICAM are co-organizing six environmental and applied mineralogy sessions at the 2006 meeting of IMA in Kobe, Japan: bio-geo interface in minerals; mineral-water interactions: from microscopic to macroscopic aspects; environmental and medical mineralogy; clays and zeolites: natural and synthetic materials; crystals, ceramics and glasses with advanced physicochemical properties; and process mineralogy. CAM will be co-sponsoring applied mineralogy sessions at the ninth quadrennial ICAM meeting to be held in Brisbane, Australia, in 2008.

Richard Hagni, Chairman
Commission of Applied Mineralogy