

NEWSLETTER NOUVELLES OF THE MINERALOGICAL DE L'ASSOCIATION ASSOCIATION OF CANADA MINÉRALOGIQUE DU CANADA

Number 60, June 1999 Numéro 60, juin 1999

EDITORIAL

SOME PROPOSALS TO ENHANCE THE FUTURE OF EARTH SCIENCES

I wish to add to Jim Nicholls' thoughtful comments on the state of Earth Sciences in Canada, which appeared in the MAC Newsletter of June 1998. I shall present my views in the form of questions.

Is Geology a Science?

When science is defined as the study of Nature, and geology as the study of Earth, then it follows that

geology is a science. But many would disagree; for example Lord Rutherford is reported to have said that only physics is science — all else is stamp collecting. One approach to the question is to recall several scientific discoveries of the past — the atom (Dalton, Avogadro, Bohr), radioactivity (Becquerel), X-rays (Roentgen), the use of X-rays to determine crystal structure (von Laue, the Braggs), applications of thermodynamics to minerals (Gibbs), the electron microscope (Ruska). All of these discoveries have been important to the development of geology, especially mineralogy and petrology, but not one of the discoverers was a geologist. Even the simple discovery of growth spirals on crystal faces (beryl) — the first direct evidence for dislocations — was by a physicist, not a geologist. At the time, mineralogists were telling us that

faces are not important, only the angles between them. Another approach to the status of geology as a science is in relation to mathematics, which since Newton have played an essential role in physics and chemistry. Although mathematics have been used increasingly in geology, it is still possible to write a Ph.D. thesis in petrology that contains only one or two mathematical equations. One could argue therefore that within universities, geology belongs with geography in the Faculty of Arts, or possibly with applied science (engineering).

On the other hand, geology, although not held in high esteem by physicists and chemists, is generally accepted by them as a science. For example, geological papers will appear in each issue of the journal 'Science', published by the American Association for the

Advancement of Science. What is unique about geology (or if you prefer, Earth Sciences, which includes marine geology, atmospheric studies, and geophysics) is a concern with **natural** inorganic changes on and in the Earth, and in a sense, this places it on a level with astronomy.

Proposal: The status of geology can be enhanced by making it more quantitative and mathematical at all levels from undergraduate university courses to advanced research.

Are Mineralogy and Petrology dying?

Vacated positions in mineralogy and petrology at Canadian universities are being filled by people in other branches of geology, or remain vacant. An example of this is a geology department known to me in which there are five environmental professors but not a single professor in metamorphic petrology; this university is positioned on the margin of the largest metamorphic terrane on Earth. In this case and possibly others, the cause for the decline of petrology appears to have been poor planning. During the environmental awakening in the mid 60's, Canadian universities were very slow to react, and now, 35 years later, there is a frantic effort to introduce environmental

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This newsletter constitutes an insert to
The Canadian Mineralogist, Volume 37, Part 3

(cont'd on page 2)

programs and hire environmental staff. A more balanced situation could have been achieved.

Mineralogy has been in trouble for a long time. In the days of Werner and Haüy, the term 'Mineralogy' was useful but this field has been encroached upon by crystallography and petrology. When mineralogists recognized that the atomic structure of minerals is more interesting than other properties they became crystallographers, and when they recognized that the **behaviour** of minerals is even more interesting, they became petrologists. Even today, remaining mineralogists continue to focus on one mineral at a time, rather than on assemblages of minerals (as J.B. Thompson once remarked, this is like focussing only on celery at a banquet), and perhaps mineralogy as it was defined is disappearing. Meanwhile, as more petrologists refer to themselves as geochemists, petrology is also on the decline.

On the other hand there are several very successful journals with petrology and/or mineralogy in their titles, and some Canadian universities continue to be strong in these areas.

Proposal: Given that there is strength in numbers, it may enhance the status of the study of minerals to bring the different fields together under one heading, similar to the heading 'Material Sciences'. But what would it be (Mineral Sciences?), and is this possible?

What has happened to planetary geology?

For nearly 100 years, geologists have studied meteorites and have pondered the origin of the solar

system, and it was always understood that geology is the study of Earth and other planetary bodies. During the golden age of space exploration, geologists were in fact very active in solar-system studies, but today there are very few universities in Canada that offer courses in planetary geology. (Departments that are changing their name to Earth Sciences seem to have intentionally excluded any planets other than Earth). Moreover, interest in the solar system is very strong among certain people in neighbouring sciences and the general public.

Proposal: The status and prestige of geology can be enhanced by revitalizing research and teaching in the area of planetary geology.

4. What is the value of the geology-mining connection?

The Bre-X incident was extremely damaging to geology. The chief geologist and vice-chairman was trained at a Canadian university — did he not learn that analytical data must always be verified, especially when large sums of money are involved, and in his course on mineral deposits did he not attend a single lecture on mining ethics? The Voisey Bay find, which you also referred to, and many other mining ventures including diamonds in the NWT and gold at Yellowstone have brought into confrontation geologists and environmentalists. Which side are we on? Similar comments apply to the oil and gas industry.

Proposal: 1) The status of geology as a science will increase when research geologists distance themselves from the mining industry, and when they begin to become far more critical of mining companies and the governments

FROM THE MANAGING EDITOR

HODGE PODGE*

I am pleased to be presenting to you the first issue of the Newsletter in 1999 and we are back on track. Many thanks to all of you who have generously contributed articles, news items, or have promised to write for future issues.

The last two editorials have brought many interesting perspectives on the future of Earth Sciences from our members and we publish some of your views in this newsletter under *Debating Issues*. We also feature a guest editorial by Ralph Kretz. How fitting that the scientist to whom we have just dedicated the thematic issue of *The Canadian Mineralogist on Mineral-Scale Processes in Metamorphic Petrology* shares his views with us!

What better way to start again *Museum in the News* than by focussing on the Royal Ontario Museum and its recent opening of the Inco Limited Earth Sciences Gallery!

Members in the News highlights two people involved in the Council of your Association but I can only report on news I am aware of and I encourage you to contribute to this feature. Jim Nicholls, our president, received the Career Achievement Award of the Volcanology and Igneous Petrology section of the Geological Association of Canada one year ago. We publish the citation. Pat Sheahan has broken another barrier in her distinguished career by becoming the first woman president of the select Toronto Club.

You will find the descriptions and call for nominations of the awards given annually by MAC on page 8. We rely on our members to bring to our attention worthy candidates for these awards. Behind every medal winner, there are colleagues who have taken the time and the initiative to write a nomination and to get supporting letters. Deadline is December 31. Now is the time to start planning. ❖

Pierrette Tremblay
Managing editor

* Hodge podge is a traditional Nova Scotia recipe made with an abundance of fresh vegetables. (Cook till just tender the following fresh vegetables – potatoes, carrots, cauliflower, peas, beans. Add warmed up cream, pieces of bacon cooked to a crisp. Season with chives, salt, pepper and herbs of your choice.)

that support them. 2) All students should be required to attend lectures on professional and environmental ethics.

In conclusion, geologists do have a problem, but then so do physicists (their misguided support of nuclear power and their Hiroshima nightmares), chemists (ten

thousand toxic chemicals in the environment), bioscientists (animal rights violations and genetic manipulations), and archeologists (desecration of sacred burial sites). We must try to change our attitudes and improve our conditions; there is hope. ❖

Ralph Kretz

ASSOCIATION NEWS

HIGHLIGHTS FROM THE COUNCIL MEETING

■ As custom dictates, the MAC Council met prior to its annual meeting, held jointly with the Geological Association of Canada, in Sudbury. It was an intense day of discussion and debate. We welcomed Peter Burns, incoming councillor, and Iain Samson, incoming Finance Committee Chair. It is inspiring to see the commitment of all members of Council to the Association.

Finance

• Mati Raudsepp, treasurer, presented a sobering 1998 financial report with a deficit of \$120K. This report certainly coloured all the decisions made at the meeting. In 1998, we absorbed the printing costs of Special Publications 2 and 3 and had relatively little income for these as they were printed in the latter part of the year. We also published two short course volumes. As no such large expense is planned for 1999 and as sales of the special publications and short course volumes are doing nicely, we hope to present a large surplus in 1999-2000 to offset this deficit.

On the bright side, the IMA meeting was a financial success and MAC as the sponsoring organization gets a large share of the profit.

• At the May meeting, we usually approve the membership fee structure for the following year. However, our new Finance Chair asked to be given a little more time to



Council Members hard at work

settle into his position before making a recommendation for the fee structure for 2000. A decision will be made in September.

• MAC expects to receive about \$11000 from the profits of the Quebec 1998 meeting.

Outreach

• Dante Canil volunteered to look into the feasibility of organizing a Distinguished Lecture tour sponsored by MAC starting in 2000.

• Let it be known that organizers of Regional Student Conferences can get a grant from MAC. Organizers need to contact Jeanne Percival at jperciva@nrca.gc.ca or at 613-992-4496.

• The sub-committee set up to review outreach activities for the period 1995-1999 presented its preliminary conclusions and recommendations. Outreach activities have broken even, have enhanced the profile of MAC, and have attracted new members. It recommended

that the sales drive for the posters, postcards, and other products be continued and that additional products with wide customer appeal be developed.

Publication News

• The newly formed Publications Committee held its first meeting. The Committee was given an additional mandate: to look into the feasibility of electronic publishing for our journal. We are anxious to hear your views on the subject.

• *The Canadian Mineralogist* is still running late but we are trying hard to catch up two weeks per issue. Our plans are that, by the June 2000 issue, every issue of *Can Min* for any given month will be sent out on the last week of the previous month (for example, the June 2000 issue will be mailed in the last week of May). After a few years of changes – we have changed typesetter and printer three times in the last three years – we think we

have reached stability. We have rationalized all of our printing and typesetting costs.

• Rob Raeside accepted the position of Short Course Editor. He replaces John Jambor.

• Council approved the publication of the proceedings of an international workshop on the health effects of chrysotile asbestos (see Newsletter 58, p.8) as a supplementary issue to volume 37 of *The Canadian Mineralogist*. This will not be one of the six issues members receive. Members will be given an opportunity to buy this supplement when they renew their membership for 2000.

• Kurt Kyser's proposal for a short course on *Tracing Fluid Histories in Sedimentary Basins* was accepted. This short course will be held at GeoCanada 2000 in Calgary. The preliminary slate of speakers includes Kurt Kyser, Eric Hiatt, Fred Longstaffe, Ian Hutcheon and Bernard Marty.

ASSOCIATION NEWS

Business Office News

• The 1999 membership renewal was sent in February 1999. After discussion at the Council meeting, it was decided to send the 2000 renewal in September 1999. This decision was made because many of our corporate members establish their budget for the incoming year around that time. So when you get your renewal form, you might wonder "Didn't I just pay this?" We rely on your understanding to help us get back on track.

It has also been customary to send the first issue of the year to members of the previous year even though they had not yet sent their renewal. Council has decided that this courtesy will no longer be extended. A final notice will be sent with the December issue.

• Our web page is now on a secure server and it is safe to send in your order via the web. Please note our web site address: www.mineralogicalassociation.ca

Meet our Finance Committee Chair

Iain Samson received a B.Sc. in applied geology in 1979 and a Ph.D. in economic geology in 1983 from the University of Strathclyde. From 1983 to 1986, he was a Research Associate with the Mineral Exploration Research Institute (IREM-MERI) at McGill University. In 1986 he joined the faculty of the University of Windsor where he is currently an Associate Professor and Chair of Earth Sciences. His research interests are in the genesis of hydrothermal mineral deposits and



Members of Council 1999-2000 at the MAC luncheon. From left to right: Iain Samson, Mati Raudsepp, Eric Essene, Peter Burns, Pierrette Tremblay, Jim Nicholls, Gina LeCheminant, Roger Mitchell, Patricia Sheahan, Brian Fryer. Far right, Andy McDonald, MAC representative on the Sudbury 99 Organizing Committee. Council members not in the picture: Jeanne Percival, Dante Canil, Jonathan Fowler, Yuanming Pan, Larry Heaman.

the geochemistry of hydrothermal systems. He has published papers on a variety of mineral deposits, including SEDEX Pb-Zn, granite-related W, Mo, Sn, and Cu deposits and Precambrian Au-Ag deposits. His current research is focussed on the genesis of REE and other rare-element deposits, particularly those associated with alkalic igneous rocks, and on the microbeam analysis of fluid inclusions.

Meet the new Short Course Editor

Rob Raeside is a graduate of Aberdeen, Queen's and Calgary (B.Sc., 1976, M.Sc., 1978, Ph.D. 1982 respectively). He has worked on «kimberlites» in Montreal (although Roger Mitchell might object to the word kimberlite here!) and migmatites in British Columbia for his thesis studies. He started teaching at Acadia in 1982, and has been there ever since, serving as head of Geology since 1995. His

research interests are primarily in metamorphic petrology and tectonics. When he started at Acadia he planned to work on the petrology of Cape Breton metamorphic rocks. However, the first day in the field demonstrated that he had to map the area first – the undifferentiated schists and gneisses turned out to be diorites and tonalites. Thus began a 10-year phase of mapping and investigation of the structural geology and tectonics in the core of the Appalachian Orogen. Through his graduate students, he has also maintained an interest in the low-pressure regional metamorphism and contact metamorphism of the highly aluminous rocks of the Meguma terrane of southern Nova Scotia.

MAC Foundation Annual Meeting

The MAC Foundation held its 2nd annual meeting on May 24, 1999. The Chairman of the Foundation, Roger Mitchell, reported that

notices of the \$10 000 scholarship were sent to all Canadian Universities with a graduate department and ads were published in *The Canadian Mineralogist* and the Newsletter. An application form was designed in both French and English. The Scholarship Committee, composed of Jeanne Percival, Yuanming Pan and Jonathan A. Fowler evaluated the applications received and is pleased to announce that the first winner is Shannon Patrick Farrell, a Ph.D. student at the University of Western Ontario under the supervision of Michael Fleet.

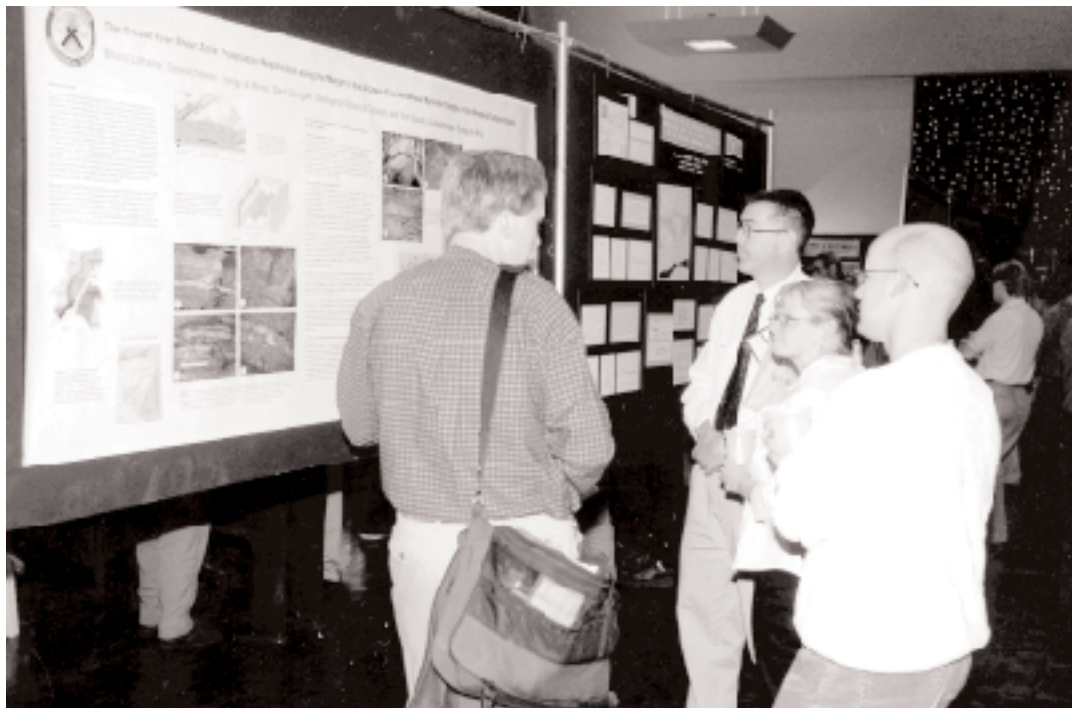
The Fundraising Committee was not active in 1998-99. Activity was deferred until the first scholarship award and the printing of a brochure. Members of the Fundraising Committee are Roger Mitchell, Pat Sheahan, Art Soregaroli, Mati Raudsepp and Jim Nicholls. In the coming year, they will be soliciting matching funds.

ASSOCIATION NEWS

HIGHLIGHTS OF SUDBURY 99

■ "I am very happy that it is over, but more so that people had a good time. To me, that is (and was) the most important aspect of the meeting. These meetings are often only three days or so, but the memories of them hopefully last a lifetime," commented Andy MacDonald, MAC representative and vice-chairman of the Sudbury 99 Organizing Committee.

Even though 1998 was an exceptional year for international meetings held in Canada, the Sudbury meeting, with a first-class scientific program and excellent pre- and post-conference field trips, drew more than 800 attendees. The weather was quite wet and cold for the pre-conference field trips



Poster sessions held in the exhibit hall generated lively discussions as usual.

but turned out beautiful for the meeting. Everyone appreciated Sudbury's fasci-

nating geology: where else can you drive by shatter cones on your way to the conference every morning?

I was impressed by the quality of the talks I attended and fascinated by the material used in the presentations. After having read Jim's editorial in the June 1998 Newsletter, I was relieved to watch talented young scientists innovating in the way they presented exciting research. Mineralogy is alive and well in Canada! The Local Organizing Committee innovated in presenting plenary sessions on a wide range of topics at the end of each morning. To be repeated.

Social events were well attended. The evening at

MAC thanks the
Sudbury 99 Organizing
Committee for a very
successful and well
run meeting.

Science North was enjoyed by all. We were privileged to get a preview of the first IMAX film made by Science North titled *Gold Fever*. Watch for it at your local IMAX theatre. It has adventure, excitement, glamour, spectacular Yukon scenery, and lots of information on this precious metal: a good mix for success. ❖

Pierrette Tremblay

APOLOGIES

At the recent GAC/MAC meeting in Sudbury, Ontario a scheduled paper by A. Stilling, P. Černý, and P.J. Vanstone entitled *Bulk Composition of the Tanco Rare-Element Pegmatite, Southeastern Manitoba and its Petrological Significance*, was mistakenly cancelled. Professor Černý, the scheduled speaker, was informed of the cancellation only at the time the talk was scheduled. The cancella-

tion caused unnecessary embarrassment and humiliation for Professor Černý and his co-authors, as well as depriving registrants to the meeting of hearing the results of their research. The Mineralogical Association of Canada sincerely apologizes to Professor Černý, A. Stilling and P.J. Vanstone. The Association will make every effort to ensure that such cancellations do not occur in future meetings.

AWARDS PRESENTATION

One of the highlights of the Sudbury 99 meeting was the MAC annual luncheon and the awards presentation. We present here some excerpts from the citations. Watch for full citations and responses in the December issue of *The Canadian Mineralogist*. We congratulate the winners on their achievements.

FRANK C. HAWTHORNE GETS PAST PRESIDENTS' MEDAL

Frank Hawthorne, University of Manitoba, began his career working on the crystal chemistry of amphiboles at McMaster University. This work led to a general interest in complex problems, and in particular those involving rock forming minerals. Consequently, he has worked on many minerals of geological importance e.g. staurolite, vesuvianite, pyroxenes, beryl, tourmaline, and in all instances has solved many outstanding structural and crystal chemical problems.

Throughout his career he has been involved in the application of novel analytical and spectroscopic methods to mineralogical problems. In particular, he has been a strong proponent of the multi-technique approach to complex crystal chemistry problems.

His principal area of interest for the last 10 years has been in the energetics of minerals. This work has been recognized as an important



The 1999 medalists. From left to right, Frank Hawthorne, Past Presidents' Medalist, Lee Groat, Young Scientist Award, Robert A. Mayanovic and Alan Anderson, Hawley Medalists and Norm Halden, Berry Medalist.

advance in solid state chemistry and crystallography.

Recently, Hawthorne and his students have worked on Cu^{2+} -oxysalt minerals in an attempt to understand the Jahn-Teller effect and electron-photon coupling in these structures.

The common thread that runs through all of Frank's work is the desire to develop a simple and intuitive understanding of complex minerals and their roles in geological processes. Although the more complex minerals are difficult to characterize and understand, they intrinsically contain more information than simple minerals on the history of the environment in which they occur. This has been the motivation

for most of Frank's work and it has had a broad influence on a variety of geological disciplines and has contributed significantly to our understanding of a variety of geological environments.

Frank Hawthorne is a scientific leader. He is the driving force behind many of the new and exciting ideas in mineralogy today. In parallel with this scientific progress, he is compelled to do as much as possible to bring this work to the attention of others. He is consistently and continually involved with the organization of conferences and symposia, activities which have been complemented by long periods of service to scientific associations.

Frank has worked with, "created", and influenced some of the country's best graduate students in the mineralogical sciences and his desire to understand complex minerals is being passed on to a new generation of mineralogists.

Roger H. Mitchell
Past President MAC

YOUNG SCIENTIST AWARD TO LEE GROAT

Lee Groat, Associate Professor of Mineralogy at the Department of Earth and Ocean Sciences, the University of British Columbia has already published almost 50 papers in highly respected periodicals such as *The Canadian Mineralogist* and the *American Mineralogist*, together with a similar num-

AWARDS PRESENTATION

ber of abstracts. These publications have established his international reputation for high quality research.

Equally important, Lee has demonstrated to mineralogists a commitment which extends beyond his own research interests in the crystallography of mercury minerals and the mineralogy of pegmatites. Thus, in 1997, he organized the MAC short course on *Biological – Mineralogical Interactions* and co-edited Short-Course Volume 25. He organized with T.S. Ercit and A. Anderson a special session on "Granitic Pegmatites" at the 1996 GAC/MAC Annual Meeting, and the trio subsequently guest-edited the 350 page special issue of *The Canadian Mineralogist*: "Granitic Pegmatites: The Černý – Foord Volume (Can. Mineral. 36, 249-680, 1998). Lee also served on MAC council from 1993 through 1995 and during his term he was notably active as Chair of the Membership Committee. Recently, he has been involved in furthering proposals urging the development of a Canadian synchrotron facility. Last year Lee completed his term as an Associate Editor of the *American Mineralogist*, but he kindly agreed to a year's extension.

Although he is still a young scientist, Lee's contributions have been formidable; not only has Lee shown that he is an accomplished researcher, but he has also demonstrated himself to be a

person of scientific generosity, one who has been willing to share his expertise and time for the success of others and the betterment of mineralogy.

Roger H. Mitchell
Chairman, MAC
Young Scientist Award
Committee

THE HAWLEY MEDAL TO ALAN ANDERSON, ROBERT MAYANOVIC, AND SAŠA BAJT

The Hawley Medal, for the best paper published in *The Canadian Mineralogist* in 1998, was awarded to Alan Anderson of St. Francis Xavier University, Robert Mayanovic of Southwest Missouri State University, and Saša Bajt of The Univer-

sity of Chicago. Their paper entitled: **A Microbeam XAFS Study of Aqueous Chlorozinc Complexing to 430°C in Fluid Inclusions from the Knau-mühle Granitic Pegmatite, Saxonian Granulite Massif, Germany** was published in volume 36, pages 511-524.

The paper was selected by the Hawley committee for its innovative approach to the study and interpretation of fluid inclusions and its influence in opening up new areas of research and for its application of synchrotron radiation. This is indeed an appropriate choice, given the recent Canadian Foundation for Innovation award to the Canadian Light Source facility in Saskatoon, to be completed by 2003. Alan and colleagues have been pio-

neers in the application of synchrotron radiation to mineralogical research. Papers such as this year's Hawley winner demonstrate the potential of the technique to complement our existing toolbox for research on solids, liquids and gases. It also gives me great pleasure to present the Hawley Medal to a mineralogist employed at a small university. The enthusiasm and diligence of scientists employed in small universities are often not recognized by granting councils and agencies. Excellent research depends on the excellence of the scientists, not their place of employment.

Jim Nicholls, President
MAC



University of Manitoba staff and alumni were well represented at the awards presentation. Professors Norm Halden (Berry Medalist), Frank Hawthorne (Past Presidents' Medalist) and alumni Peter Burns (1998 Young Scientist Awardee), Alan Anderson (Hawley Medalist) and Lee Groat (1999 Young Scientist Awardee).

CALL FOR NOMINATIONS

PAST PRESIDENTS' MEDAL

The Past President's Medal is awarded to a scientist who has made outstanding contributions to the mineralogical sciences in Canada. There is no restriction regarding nationality or residency. The medal is intended to recognize the breadth and universality of these contributions in mineralogy, applied mineralogy, petrology, crystallography, geochemistry or the study of mineral deposits rather than in a narrow area of expertise. A committee of three Past Presidents, chaired by the immediate Past President considers all nominations received. Nominations should be accompanied by a one page explanation of the merits of your nominee and forwarded to Roger Michell, Dept. of Geology, Lakehead University, Thunder Bay, Ontario, P7B 5E1 by December 31st, 1999.

Previous recipients of the medal are:

Len Berry (1982), Gabrielle Donnay (1983), Petr Černý (1984), Denis Shaw (1985), Don Sangster (1986), Peter Roeder (1987), Steve Scott (1988), Rob Kerrich (1989), Lincoln Hollister (1990), Tony Naldrett (1991), Robert Boyle (1992), Louis Cabri (1993), Roger Mitchell (1994), Hugh Greenwood (1995), Thomas E. Krogh (1996), Mike E. Fleet (1997), Fred J. Longstaffe (1998) and Frank C. Hawthorne (1999).

BERRY MEDAL

The Leonard G. Berry Medal is awarded annually for distinguished service to the Association. The award recognizes significant service to the Association in one or more areas that may include leadership or long-term service in an elected or appointed office. The medal is named after Leonard G. Berry (1914-1982), a founding member of the MAC, editor of *The Canadian Mineralogist* and its predecessor for 25 years and first winner of the MAC Past Presidents' medal. The medallist is chosen by a committee consisting of the two immediate past recipients of the medal and one member-at-large, chaired by the Vice-President (ex officio). Nominations are encouraged from the membership at large and should be sent to Dr. Brian Fryer, College of Engineering & Sciences, University of Windsor, 410 Sunset Ave., Windsor, ON N9B 3P4, by December 31, 1999.

Previous recipients of this medal are:

Les Nuffield (1988), Guy Perrault (1989), Joe Mandarino (1990), Dick Alcock (1991), John Jambor (1992), Louis Cabri (1993), Ann Sabina (1994), Bob Gait (1995), Sol Kaiman (1996), J.M. Duke (1997), Dorian G.W. Smith (1998), and Norman Halden (1999).

YOUNG SCIENTIST AWARD

This award is given to a young scientist who has made a significant international research contribution in a promising start to a scientific career. The areas of research considered are any or all of those covered by the Mineralogical Association of Canada.

- The scientist will be 40 years or younger at the time of the award.

- The scientist must be a Canadian working anywhere in the world or a scientist of any nationality working in Canada.

- The research areas include mineralogy, crystallography, petrology, geochemistry, mineral deposits, and related fields of study.

- The candidate must be nominated by a member of MAC.

- The letter of nomination must be accompanied by a statement giving the accomplishments of the candidate, the candidate's curriculum vitae, and list of publications.

- Candidates may also be identified by members of the selection committee.

- The selection committee will be made up of the Past President and three other MAC members selected by the Past President.

- The selection of the winning scientist normally will be made in January or February in order that the award can be presented at the May Annual Meeting of the Association.

- The award need not be presented in any given year if a suitable candidate cannot be found.

- Previous winners of the award are Peter Burns (1998) and Lee Groat (1999).

Nominations should be sent to Dr. Roger Michell, Department of Geology, Lakehead University, Thunder Bay, Ontario, P7B 5E1 by December 31, 1999. ❖

CATCHING UP ON MORE ASSOCIATION NEWS

MINERALOGICAL ASSOCIATION OF CANADA STUDENT AWARDS 1997-99

The following is a list of MAC Student Awards winners from 1997 to 1999. The Student Award is given annually to an undergraduate student (2nd year of study or higher) at a recognized Canadian university or institution of higher education for excellence in one of the specialties supported by MAC (mineralogy, crystallography, geochemistry, petrology and mineral deposits). The award consists of one of MAC's publications, the choice of which is left to the prize recipient, and a one-year subscription to *The Canadian Mineralogist*.

The Mineralogical Association of Canada congratulates the following students:

Jo Ann Adam, University of Windsor
Jennifer J. Adams, University of Waterloo
Matthew D. Alexander, St. Francis Xavier University
Sharyn Alexander, McMaster University
Olugbemi Amurawaiye, Lakehead University
Vaia Barkas, University of Toronto
Nicholas A. Barnes, McGill University
Laurel C. Basciano, Queen's University
Sheryl M. Beaudoin, Simon Fraser University
Regula Binggeli, Université du Québec à Trois-Rivières
Dan Block, University of Saskatchewan
Steve Boucher, École polytechnique de Montréal
Miriam Campbell, University of Ottawa
Gabriella Carrelli, Concordia University
Anna A. Cervi, University of Windsor
Rhonda S. Cochrane, Brandon University
Claire A. Currie, University of Western Ontario
Jerry C. DeWolfe, Saint Mary's University
Katherine M. Dilworth, Queen's University
Angela Dowd, Brandon University
Kristen L. Dupuis, University of New Brunswick
Nancy Duquet, Haileybury School of Mines
Jason W. Durant, University of Western Ontario
Laura Gates, University of Calgary
Courtney E. Goulder, Lakehead University
Karen D. Hincks, Okanagan University College
Greg W. Huffman, Laurentian University
Elizabeth Ilnicki, Brock University
Ashley D. De Jonge, Saint Mary's University
Peter Koekuyt, University of St. Catherines
Andrew K. Langille, Acadia University
Diana B. Loomer, University of New Brunswick
Dylan MacGregor, Simon Fraser University
Marianne M. Mader, University of New Brunswick
Lisa A. Maher, Lakehead University

Sarah Mearon, University of Manitoba
Gary G. Millard, University of Calgary
Curtis J. Moffat, University of Manitoba
Michelle Morrison, St. Mary's University
Donnette M. Mugridge, Acadia University
Brandon Ott, University of Guelph
Neil Pettigrew, University of New Brunswick
Kimberly Pieper, McMaster University
George W. Pollock, Haileybury School of Mines
Maya Rae, University of Waterloo
Michael Rees, Memorial University of Newfoundland
Sarah Richardson, Dalhousie University
Joseph T.F. Riddell, University of Western Ontario
Oliver Riffon, École polytechnique de Montréal
Brigitte A. Roy, St. Francis Xavier University
Danette L. Schwab, Simon Fraser University
Renée-Luce Simard, Université du Québec à Chicoutimi
Jeffrey J. Smith, University of Saskatchewan
Michael Surka, University of Manitoba
Alex I. Terentien, University of Toronto
Stuart Venables, Acadia University
Philippe-Alexandre Villeneuve, Université du Québec à Chicoutimi
Halan Wang, University of Toronto
Sarah G. White, Haileybury School of Mines
David A. Willms, Okanagan University College

GIFTS TO THE MINERALOGICAL ASSOCIATION OF CANADA

The Mineralogical Association of Canada gratefully acknowledges donations received from the following members:

C. Anglin	Ottawa, ON Canada
W. Baragar	Ottawa, ON Canada
H. Belkin	Reston, VA U.S.A.
M. Broekmans	Trondheim, Norway
M. Carter	Toronto, ON Canada
P. Černý	Winnipeg, MB Canada
E. Chow	Kingston, ON Canada
W. Danner	Vancouver, BC Canada
D. Gold	University Park, PA U.S.A.
B. MacKean	Denman Island, BC Canada
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A. Sabina	Ottawa, ON Canada
C. Schwab	Tampa, FL U.S.A.
J. Soles	Ottawa, ON Canada
D. Stewart	Reston, VA U.S.A.

MEMBER IN THE NEWS

PAT SHEAHAN ELECTED PRESIDENT OF TORONTO CLUB

■ In 1998, Pat Sheahan became the first woman president of the select Ontario Club. She joined the Engineers' Club in Toronto back in 1983 when women were first admitted as members and became a director in the late 1980's. When the Engineers' Club merged with The Ontario Club in 1992, Pat continued as a director of The Ontario Club and has been elected their President in 1998 and 1999. The Club is affiliated with 400 professional clubs around the world and was the first club to have a junior and intermediate category of members. The members span all facets of business, exploration, mining, brokerage, legal, banking, accounting and many entrepreneurial fields.

Pat graduated from Carleton University with a geology major and her career path was set early on while working summers for the GSC. She researched and compiled mineral occurrences for Bob Traill's Catalogue of Minerals. She then joined Selco Mining Corp. in Toronto and worked full time as a geologist for three years before 'retiring' to raise her two daughters. Her interest in 'keeping current' initiated the Scanning Geoscience Information Services for diamond and precious/base metals. Her consulting firm Konsult International Inc. has provided bibliographic compilations to exploration companies around the world for the past thirty-five years. Pat has been monitoring traditional literature and specializing in grey literature (information derived from conferences, information handed out or contained in non-traditional formats).

Her databases are unique and recently she donated her historical diamond database as well as books and paper reprints to the Mineral Deposit Research Unit of the University of British Columbia. "This has been a labour of love and I really wanted a home for the collection, one where it would be useful and appreciated" said Pat. The collection housed in more than 100 boxes is valued at \$500 000.

Over the years, Pat has volunteered her time and energy to many geological associations. She was the Publications Chair for the Mineral Deposits Division of GAC for 9 years and was instrumental in developing the popular Ore Deposit Models series of which she was co-editor. She indexed most of the GAC volumes published during that time. Pat became the Chair of Publications for the Society of Economic Geology and remained in that position for 7 years. She began the Special Publication series and was part of the editorial team of the very successful SEG Newsletter. She continues to write a column on recent publications in the SEG Newsletter. Recently, she was asked to become a councillor for MAC and was very pleased to accept. Pat is also a member of the MAC Foundation. She has been a director of the PDAC for two terms and has been on their technical committee for the past nine years.

Pat Sheahan often uses quotes in her reports. This one from Winston Churchill is one of her favorites and might have been her personal motto, as throughout her career, Pat has given selflessly to society and to her profession.

*We make a living by what we get,
we make a life by what we give.*

JIM NICHOLLS GETS CAREER ACHIEVEMENT AWARD

■ We reprint here the citation published in Geolog and written by Ned Chown "The Volcanology and Igneous Petrology Division of the Geological Association of Canada awarded its 1998 Career Achievement Medal to Dr. James Nicholls, Professor in the Department of Geology and Geophysics, University of Calgary. Several years ago the Volcanology and Igneous Petrology Division added "Igneous Petrology" to its name to better reflect the research interests of our membership. Additionally, this award was implemented as a fitting tribute to researchers in Canada who have led the way in the fields of volcanology and igneous petrology.

Jim Nicholls ranks in the forefront of petrologists not only in Canada, but on a world-wide basis. He has chosen as his field the difficult area of petrological problem-solving using mathematics and thermodynamics and in this he has been extremely successful. His work has been consistently innovative and has involved investigations in Hawaii on Kilauea volcano where he studied lava liquid lines of descent, Craters of the Moon lava field where fractionation and contamination were the focus of study, and of course here in Canada, in British Columbia on a variety of Quaternary volcanic centres.

In all of this, Jim's most outstanding research has been the application of advanced mathematical techniques to theoretical problems not previously solved. A partial list of his work gives a glimpse into this rare achievement: singular points on fractionation curves in silicate systems, the mathematics of fluid flow and magma transport, principles of thermodynamic modelling of igneous processes, Pearce element ratios and the Chayes closure problem, and Bayesian methods and hypothesis testing. The rigour of the science practised by Jim Nicholls, his colleagues and students is a model of how science should be done."



Congratulations to Dave Watkinson who received the Duncan R. Derry Medal, and Dave Lentz who received the William Harvey Gross Medal from the Mineral Deposits Division of the Geological Association of Canada at the Sudbury meeting.

CONFERENCE REPORT

THE CANADIAN MICRO MINERAL ASSOCIATION ANNUAL SYMPOSIUM

The Canadian Micro Mineral Association (CMMA) is dedicated to the study of minerals mounted for viewing in reflected light under a stereoscopic microscope. Basically an amateur organization, it was founded in 1963 as The Guild of Micromounters (a "micromount" is a mineral specimen positioned in a small box for viewing under the microscope), but adopted the CMMA designation in 1967. The membership averages about 120, of which some 45% are residents of the USA. The primary occupation of members ranges anywhere from salesman and homemaker to theoretical physicist, with a sprinkling of medical doctors, military officers and professional mineralogists. The Association has one major conference in May of each year, and for the last few years has hosted a second, smaller, get-together in late November.

The annual symposium for 1999 was held, as it has been for the last eighteen years, at Brock University in St. Catharines, Ontario. Unfortunately, the University was available only during the weekend of May 7-9, which resulted in several conflicts with other events (including Mothers' Day), leading to a reduced attendance. Normal attendance is eighty or more, but the conflicts of 1999 dropped that closer to sixty-five. In any event, the success of such an affair lies not so much on the number of people who show up, but on the number of microscopes. Most attendees bring their own. Since stereoscopic microscopes take up a fair bit of room, the symposium occupied two laboratory rooms in the Geology Building, and overflowed into the hallways with sample tables.

The symposium begins traditionally on Friday night with a wine and cheese party (after all, this is the Niagara Peninsula), the high point of which is the showing of mineral photomicrographs taken by members of the group. Because most amateur mineralogists lack access to sophisticated analytical instruments, they have to rely on simple physical tests such as density and hardness for identification. Above all, they rely on sight recognition. So many recently described new minerals are microscopic in size that recognition relies heavily on their appearance under the microscope. The result is that photomicrography has become one of the primary skills among micromounters. Some have achieved remarkable results, considering that the choice of backgrounds is limited, the position of the specimen is usually fixed by the matrix, and the depth of field is practically nil.

Early on Saturday morning, the two laboratory rooms filled with microscopes, and conference attendees began trading specimens, searching the give-away tables for hidden treasures, and browsing the sales tables for species needed to fill gaps in collections. The sales tables were of primary interest to the Mineralogical Association of Canada in this instance, since this was the first time that copies of MAC special publications, *Encyclopedia of Mineral Names*, *Glossary of Mineral Synonyms*, and *Atlas of Micromorphology of Mineral Alteration and Weathering* had been placed for sale at such a gathering.

It may surprise those unacquainted with micromounting to hear that there were give-away tables at the conference. That is one of the features that makes this hobby unique. Micromounters have a history of visiting quarries and collecting specimens with four



Rear: Marc Favre, Modris Baum, Paula Piilonen, Lois Hornblow. Front: Garry Glenn and Andy McDonald

things in mind: collecting for themselves; collecting for universities or museums in need of samples; collecting for trading with others around the world; and collecting extras for giving away to those unable to visit the quarries themselves. All of the micromount symposia held across North America each year have special tables set aside for material that is to be given away. Those tables are always filled, and always have worthwhile specimens. Amateurs who collect only cabinet specimens miss out on the wealth of micro material available for free at any micromount meeting.

The primary difference between give-away tables and sales tables is that the specimens on the sales table usually have already been mounted for viewing, and require no further preparation. Some are particular rarities or have some historical association with one of the great collectors of the past. For example, a microscopic specimen of apatite mounted by the Reverend George Gilbert Rakestraw in a small cardboard box and offered for sale through mineral dealer George L. English for 25¢ in 1895, might well fetch \$75 on a sales table today. Most modern mounts, on the other hand, sell for less than \$10, although those of rare new species can go for hundreds.

Saturday afternoon saw more of the same, with the

addition of a show of photomicrographs projected for stereoscopic vision and a silent auction of donated material. The main event, however, was saved for that evening following the annual banquet. Micromounters and scientists alike have benefited greatly from a close association through the years. One has only to look at the number of new mineral species described by George Chao at Carleton University, Frank Hawthorne at University of Manitoba, and Bob Gault at the Canadian Museum of Nature to realize just how valuable the relationship between the amateur and the professional can be. Frank Hawthorne made exactly that point himself in a speech at the Rochester Academy of Science Annual Mineralogical Symposium in Rochester, NY, in April, 1999. Where there is a tight bond of respect between the amateur and professional, both gain from the association. Nowhere is that shown more clearly than in the relationship between CMMA members and the featured speaker at the 1999 banquet. Andy McDonald, Associate Professor in the Department of Earth Sciences of Laurentian University, took his Ph.D. under the guidance of George Chao and learned at first hand how useful amateurs can be. He has retained that bond, and proved it well in his speech illustrating the still undescribed, or at least unrecognized minerals from Mont

(cont'd on page 12)

SPARKS – A feature of the Public Awareness of Science Committee of MAC

REACHING OUT TO GRADE IV STUDENTS

The Ministry of Education for the Province of Ontario has introduced a new science curriculum in Grades 1 to 8. The curriculum introduces geological concepts in Grades 4 and 7. The Province expects Grade 4 students to understand the difference between a rock and mineral, the physical properties of minerals, the difference between igneous, sedimentary and metamorphic rocks, Earth history as interpreted from the rock record, and the processes of weathering and erosion. The details of the curriculum are available on the ministry web site. Unfortunately, most schools do not have the materials necessary to cover this important curriculum properly. In addition, most teachers have little experience with the Earth Sciences and find the task of developing the class assignments difficult. If the teaching of geology is to remain in the curriculum then we must provide materials to make it a positive experience for teachers and students. We have begun a program to assemble the necessary geological materials into a kit to distribute to the schools in Ontario. The kit is designed to

cover topics over a six-week period and has been tested in two local Grade 4 classrooms. Each kit, packed in a plastic container, will include 40 specimens of rocks, minerals and fossils, a teacher guide, a student worksheet, a geological map of Ontario (supplied by the Ministry of Northern Development and Mines) and a streak plate/ glass plate/ acid bottle.

The objects that most capture the students imagination are the bottle of HCl which makes the calcite fizz and a fossil trilobite with a discussion of life in the past. It is essential that the students see a real fossil and not a cast or photo to really spark their interest. As an example of the hands-on focus of the kit, each kit will have seven pieces of limestone, seven pieces of schist and seven pieces of granite which will be placed around the room at numbered locations. The students will create a map of their classroom and then predict what rock type is under their desk. We have begun the construction of 500 kits. We have secured funds to employ a student for the period May through August, 1999. She has begun collecting materials from the Kingston region that are necessary for

the kits. The kits will be sold at cost and this is expected to be 40-50 dollars. If the 500 kits are sold more kits will be manufactured by employing undergraduate geology students throughout the year. Initially, the kits will be marketed to Grade 4 teachers in eastern Ontario. Although the kit has been designed with the Ontario Grade 4 curriculum in mind, the materials and worksheets could be easily adapted to other levels of geological education. The kits would be particularly effective if an Earth scientist were to use them in a primary school setting.

We believe that an effective introduction to Earth Sciences in primary school is very important. Canadians who have a better understanding of Earth processes will be in a good position to understand our resource-based economy and the environment in which they live. ❖

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Canada
Telephone 613-533-6180
Fax 613-533-6592

(cont'd from page 11)

Saint-Hilaire, Québec. Many of those minerals had been first collected and brought to the attention of the professionals by members of the audience he addressed.

It is worth recording that over the 36 years of its existence, the CMMA has received excellent support from a large number of professionals in the field. Speakers have included such notables as Paul Desautels, Joe Mandarino, Bob Gait, George Robinson, Joel Grice, Bob Gault, and a host of others, mostly deeply involved MAC members. Canadian mineralogists will also have fond memories of one professional who has been a regular for many years. Don "Digger" Gorman, a teacher without peer, made Sunday morning CMMA lectures his specialty right up to 1998.

Sunday of the 1999 conference brought a further round of trading, searching, and brows-

ing, and also a second lecture by Andy McDonald. Andy chose to speak on phyllosilicates, partly because so many are found at Mont Saint-Hilaire, but also because they are among the minerals least understood by amateur collectors. His presentation made clear not only the mineral structures, but the fact that his obvious ability in lecturing made him a worthy successor to Digger himself. The conference closed in the early afternoon of Sunday. For the attendees, it was a satisfying affair in knowledge gained and new species added to collections. For the MAC, it was doubly satisfying in that every one of the books taken down—more than a thousand dollars' worth—sold, and extra order forms just melted off the table. The amateurs are clearly where the interest lies.

Quintin Wight

DO YOU TEACH MINERALOGY?

The Public Awareness of Science Committee of MAC plans to develop a new poster series: *The Essential Minerals Series*. We propose to involve your students in the design of a concept for the poster through what could be an assignment in your mineralogy course. In any case, we would appreciate you bringing this proposition to the attention of your students.

Produce a poster aimed at children age 9 to 12 illustrating that minerals are essential in our daily lives. We want young people to want to put this poster up on their walls.

- There can be short texts on the poster.
- We would like to focus on high tech minerals.
- Posters can be computer-generated or drawn using any other technique.
- Explain briefly why you chose that concept.

There will be participation prizes (short course volumes or special publication volumes).

The winner will see his or her poster published and will receive a cash award of \$200.

Send your entry before March 31, 2000 to
Pierrette Tremblay
1260 de la Chaudière
Saint-Rédempteur QC
G6K 1C5

DEBATING ISSUES

Jim Nicholls' editorial in the June 1998 Newsletter hit a sensitive nerve as we received many thoughtful responses. Some of you shared his pessimism and expanded on more reasons why Earth Sciences are in crisis; others offered suggestions and provided examples of why mineralogical and petrological studies are so important. We publish some of your views.

■ "I fully share your pessimism. Indeed, I think that here in the USA the situation is even worse than in Canada. I have no suggestions for solutions. In part at least, it's a function of our (USA) society having low esteem for academic things unless they see dollar gain.

However, some of the reasons why departments don't replace mineralogists and petrologists respectively is that they've become overly specialized and don't work together so that they feel a mutual need. Hence, for example, when a mineralogist retires, the petrologists feel no urgent need to argue for replacement with another mineralogist, and vice versa. It's a sad situation when mineralogists and petrologists don't appreciate and support each other. It undercuts their collective strength in a Department. But, this split has arisen because each group works with such specialized approaches and no thought as to how their work relates to other parts of the broader field of mineralogy and petrology."

Chuck Guidotti, University of Maine

■ "You asked for suggestions about what to use to replace the ineffective arguments (resource based) on mineralogy as relating to Canadian life and the well being of Canadians. I have found that when I develop proposals, I get much more mileage when I describe mineralogy from a materials view. Developing new materials from mineral models or mineral substrates resonates among the allied sciences, including chemistry, physics, and engineering (clearly not a science, but it still works). I do it from a clay view, but the approach will work for many other mineral groups also.

Not only can one argue about minerals as materials, but most mineralogists have the ability to examine other systems that are complex—much more so than physicists and materials researchers, for example, who can only deal with hexagonal and cubic materials."

Steve Guggenheim, University of Illinois at Chicago

■ "I agree that funding is either declining or non-existent for mineralogical and petrological studies. However the importance of such studies cannot be overstated. In Nova Scotia we have vast amounts of acid rock drainage....arsenic in the environment (at least one death)...severe fish kills

over 30 years... loss of homeowners' wellwater supply... over 20 million spent on remediation efforts at the Halifax International Airport....all mostly due to either general construction activities or the building of highways. All of these problems result from a lack of understanding (and until recently, lack of interest) of basic mineralogy. Even at this stage there has not been a rigorous study done on the basic sulphide mineral identification at the Airport site even with the 20 million or so spent on remediation. And not to mention a study of carbonate mineralogy. This would be unheard of in the mining industry but continues because of a lack of awareness by the general public about the importance of mineralogy and geochemistry. The next time you hear of environmentalists pointing a finger at the mining industry....point them to my webpage at http://meguma.earthsciences.dal.ca/~dfox/acid_drainage/ard.htm

One of the biggest acid rock drainage sites in eastern Canada is the airport which is (still) publicly owned (until it is sold)."

Don Fox, Dalhousie University

■ "... First there is still a need for Earth scientists in the resource and environmental industries, both in geophysics and the other fields, so students have to be trained as researchers, using grant money just as in biology, physics and chemistry. Second, I don't think we should drop the resource-oriented justification for Earth scientists – it is really all we have. Most of the exciting problems in science today need people with training in the other sciences. Look at crystallography for example; there is little left to do in Earth sciences (in spite of Frank Hawthorne).

Some of our problems are inherent - traditionally a science student went into geology if he did not have strong quantitative skills, so geology became a largely visual discipline. That gave some useful qualities but not enough to counteract the disdain of the physicist. Most of our best Earth scientists have tried to overcome this, which explains why the J.G.R. publishes its thousands of pages as we all masquerade as geophysicists.

Of course we are all biased in favour of the things we do best, but one traditional quality that a geologist possessed was a knowledge of terrain - rocks, landscapes, past life; a lack of this quality made it difficult for a physicist or biologist to solve Earth science problems.

So I do not know what to do to restore the past. It may be that the mineralogical sciences (to use your descriptor) are in a natural decline, soon to become extinct or at least dormant - that is what happened to optics, which was once a major branch of physics."

Denis Shaw, McMaster University

■ "I agree that we as Earth scientists have gotten into some sort of mindset that we have to marry our science to the 'resources industry etc. in order to defend our profession'. While I have not read the report on the web, it is a real eye-opener to see that somebody (unfortunately the wrong committee at the wrong time) finally recognized we need not do this in the future to justify ourselves. This is an unfortunate and continually breeding psyche that has now backfired on us. I know of no particle physicist or astronomer who defends his/her science for economic reasons, and somehow this community can actually defend its efforts (and actually blossoms – c.f. Hubble telescope) based on innate curiosity about the Universe. How have we been unable to defend ourselves on innate curiosity about our planet?"

I disagree that mineralogy and petrology are particularly falling apart, although I am willing to hear more hard evidence to the contrary. You wrote «mineralogical and petrological positions in the universities, if filled, are going to other kinds of scientists». Off the top of my head, I can give 6 examples at Canadian Universities in the last five or six years who have re-hired or expanded in these fields, by re-hiring a petrologist/mineralogist replacement, or, replacing a position in another field such as economic geology, with a mineralogist.

I agree that we have been associated with the 'wrong' side of environment vs exploitation. This is again perhaps because we hail our science as most pertinent to resource exploration/exploitation. I am all for resource exploitation – in the right place at the right time. We as Earth scientists should know enough about the Earth to carry this out. Unfortunately, we have been so long on the 'other' side that we appear a suspicious bunch. After all, many resource companies are staffed with geologists.

Are the mineralogical sciences in crisis? I don't know, and use the excuse that I am too young and immature here in academia to have a long-term perspective on this. I can only say, that somehow, somewhere, we have lost the ability to communicate to the general public what we do. We got buried in the jargon and detail? This is strange because society actually has quite an innate curiosity about minerals. Give a presentation at any seniors home or grade school. I actually believe we not only poorly communicated what we do to the public, but we have also been poor at expressing our science even to other Earth scientists. Maybe too many rock and mineral names and jargon. That is maybe why we are a 'service industry' to other Earth scientists in major mega programs. Strange isn't it, that actually mineralogy is doing as well as ever in Europe." ❖

Dante Canil, University of Victoria

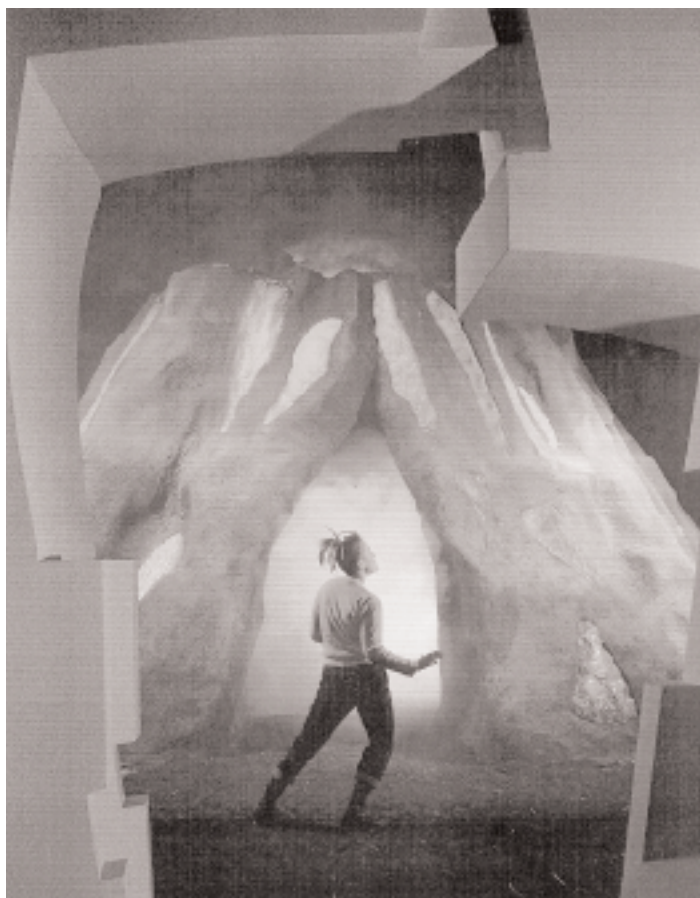
MUSEUM NEWS

FEEL THE EARTH MOVE AT THE ROYAL ONTARIO MUSEUM'S NEW DYNAMIC EARTH: INCO LIMITED GALLERY OF EARTH SCIENCES

Indeed the spectacular new gallery of the Royal Ontario Museum opened to the public on Sunday May 30, 1999 after years of planning and intense work. This newly created \$4.25 million, 14 000 square foot permanent gallery – the Museum's largest to date – comprises innovative, interactive features showcasing not only the Earth's processes and amazing products, but the story of the planet's formation and evolution. State-of-the-art lighting, sound and visual design gives visitors of all ages the opportunity to feel the awesome force of an earthquake and experience the violence of our primordial world.

Dynamic Earth highlights the interactions between Earth's major processes and demonstrates how our planet is an integrated system shaped and maintained by the geological forces of heat and pressure, plate tectonics, erosion and sedimentation, and life itself. It includes three theatres, numerous touchable interactive displays, activities and dramatic environments, as well as interesting washroom exhibits.

Visitors enter the gallery through the Crystal Cave, made with more than two tons of quartz crystals and then are led through the three sections of the Gallery. The *Restless Earth* section illustrates the geological forces at work to shape the



Entering the Volcano Theatre, where a film on Earth processes is projected on the floor.

Earth. In *Earth: the Alien Planet*, visitors experience the evolutionary stages of the planet in six experiential rooms with touchable fossils, meteorites and rocks. *Treasures of the Earth* deals more with minerals. In the *Minerals Theatre*, an audio-visual presentation "Minerals in the Making; the Inside Story" illustrates macro- and microscopic views of the growth of minerals. Visitors can explore interactive activity bays to learn about colours, shapes, and classification of minerals and gems. Commonly-asked questions are answered through stunning displays and games. The

dark, dramatic *Minerals That Glow* room of fluorescent minerals displays how ordinary-looking rocks become glamorous under ultra-violet light.

The S.R. Perren Gem and Gold room - the first phase of the Dynamic Earth Gallery, which was originally opened in 1993 – was reopened and is part of *Treasures of the Earth*. It houses 1000 of the finest gems and gold specimens in the ROM's collection. The gems are lit by state-of-the-art and energy-efficient fibre optics and the result is truly spectacular. This room was named after Dick Perren (1907-1986), an

internationally-known gem dealer who was a mentor to many young jewellers and gemmologists.

The ROM's Department of Earth Sciences was heavily involved in planning and designing this gallery along with a team of designers and illustrators. The Department employs more than 20 curators, researchers and technicians. It directs field studies internationally, and is divided into three sections:

■ **Mineralogy** builds and refines the museum's Mineral, Gem and Meteorite Collections. The ROM mineral collection ranks among the top ten in the world. It is over 100 years old and contains about 150 000 specimens from all over the world. It began with the purchase of the Ferrier collection by the University of Toronto in 1894.

Areas of research expertise include the development of microanalytical techniques for mineral characterization and the study of atoms during reactions on mineral surfaces. Research programs focus on serpentine minerals, asbestos and gem deposits, particularly emeralds, rubies and sapphires.

■ **Geology** builds the Museum's Petrology Collection. It focuses on Ontario geology, stratigraphy and ores.

■ **Geochronology** maintains and operates one of the world's leading U-Pb geochronology laboratories.

Visit the Gallery at
www.rom.on.ca/earth ❖

OUTSIDE NEWS

MINERALOGICAL SOCIETY OF AMERICA ANNOUNCES SHORT COURSE ON URANIUM: MINERALOGY, GEO-CHEMISTRY AND THE ENVIRONMENT

The low crustal abundance of uranium belies its mineralogical significance. With over five percent of minerals known today that contain uranium as an essential constituent, few «trace» elements are as significant, mineralogically or geochemically. Once thought to be rare, uranium is more abundant than mercury, antimony, silver, or cadmium. Uranium is a geochemical and geochronological indicator; U-Pb dating is one of the most important methods for dating rocks and minerals. Uranium is also an energy source, and the uranium fuel cycle has generated a great deal of interest in uranium mineralogy and geochemistry since the first controlled nuclear fission reaction nearly sixty years ago. Current interest in uranium geochemistry stems in part from the energy cycle, especially with regard to environmental issues such as coping with uranium mine and mill tailings and other uranium-contaminated sites, as well as permanent disposal of highly radioactive uranium-based fuels in geologic repositories.

The short course *Uranium: Mineralogy, Geochemistry and the Environment* will address fundamental issues such as uranium crystal chemistry, systematic uranium mineralogy, aqueous chemistry of uranium, uranium-ore genesis, and isotopic systems. More specialized subjects will also be addressed, including microbial influences on uranium geochemistry, remediation of uranium-contaminated sites, applications of uranium minerals in radioactive waste disposal, and the natural-fission reactors in Gabon. This Short Course also discusses analytical methods useful for mineralogical and geochemical research on uranium.

Location: Short Course sessions are October 22 and 23, 1999 in Golden, Colorado preceding the annual GSA/MSA meeting in Denver.

Conveners: Peter C. Burns, Department of Civil Engineering and Geological Sciences, University of Notre Dame, Notre Dame, IN 46556, USA, e-mail: pburns@nd.edu; Robert J. Finch, Chemical Technology Division, Argonne National Laboratory, 9700 South Cass Avenue, Argonne, IL 60439 USA, e-mail: finch@cmt.anl.gov.

NÉGATIF

CGA

ICDD Elects Distinguished Fellow

The International Centre for Diffraction Data is pleased to announce that Professor Walter Eysel has been elected to the ICDD list of Distinguished Fellows. Professor Eysel has been recognized by the ICDD Board of Directors for his sustained, outstanding work in the field of powder diffraction. ❖

WANTED

I would like to purchase a complete set of *The Canadian Mineralogist* (including volumes 1 to 6).

Josef Vajdak
Pequa Rare Minerals
342 Forest Avenue
Massapequa NY 11758-5707

CONFERENCES COMING UP

OCTOBER 25-28 1999

Geological Society of America Annual Meeting, Denver, CO. For details: Becky Martin. GSA Meetings Department. Box 9140, Boulder, CO 80301-9140; tel.: 303-447-2020, ext. 164; fax: 303-447-1133; e-mail: meetings@geosociety.org

MARCH 5-8 2000

PDAC's Mining Millennium 2000. Metro Convention Centre, Toronto, Ontario. For details: Prospectors and Developers Association of Canada, tel./fax 514-844-0996; www.miningmillennium.org

MAY 29-JUNE 2 2000

GEOCANADA 2000, the Millennium Geoscience Summit, joint meeting of Canada's major geoscience societies including the Mineralogical Association of Canada, the Geological Association of Canada, the Canadian Society of Petroleum Geologists, The Canadian Society of Exploration Geophysicists and others. To be held at the University of Calgary. For details: www.geocanada2000.com

MAY 27-30 2001

Geological Association of Canada - Mineralogical Association of Canada Joint Annual Meeting, St. John's, Newfoundland. ❖

Special Publication 3 of *The Canadian Mineralogist*

More than 600 stunning color photomicrographs with detailed captions illustrating all the steps of weathering, from incipient replacement along cleavages and cracks to complete replacement by secondary minerals.

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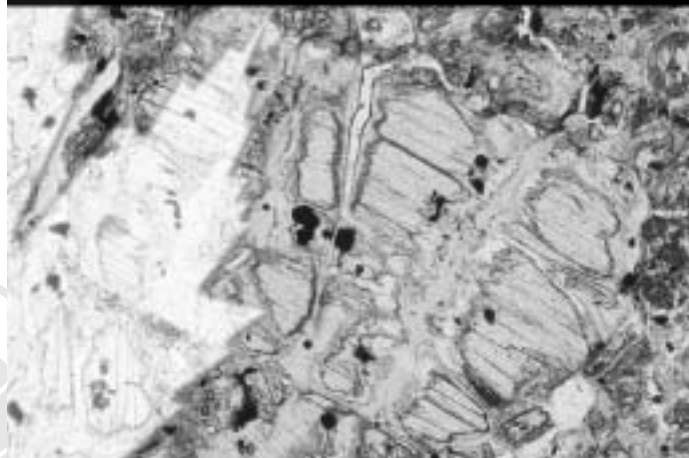
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MATLAS of Micromorphology of Mineral Alteration and Weathering

Jean E. Delvigne



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The MAC Newsletter is published twice a year by the Mineralogical Association of Canada as a service to its members.

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 mineral deposits.

Any person or organization engaged or interested in the fields of mineralogy, crystallography, petro-

logy, geochemistry and mineral deposits can become a member.

Membership benefits include: Six issues a year of *The Canadian Mineralogist*; **20% discount** on publications of the Association; special discount on registration fee at our annual meeting held jointly with the Geological Association of Canada.

Individual membership **\$90**
Institutional and corporate membership **\$310**
Sustaining membership **\$600**

Student or retired membership **\$30**
Life membership **\$1600**

For information on membership and publications, contact our business office at

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e-mail: canmin.mac.ottawa@sympatico.ca
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Graphic Design: Info 1000 Mots inc.
Printer: Nicober inc.