



August 2003

Août 2003

70

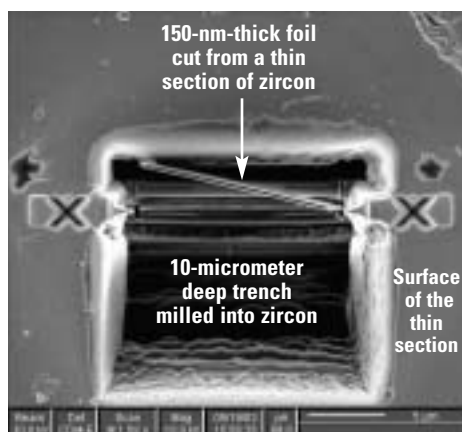
## FEATURE

### MICROMACHINING WITH A FOCUSED ION BEAM

BY ALAN J. ANDERSON<sup>1</sup> AND RICHARD WIRTH<sup>2</sup>

Proper chemical and structural characterization of inhomogeneous minerals and amorphous solids is requisite for the interpretation of many geochemical processes. It is therefore ironic that a tool with the unfortunate acronym of FIB may be the key to truthful characterization of some complex mixed materials.

The focused ion beam (FIB) is used primarily for extremely precise (submicrometer



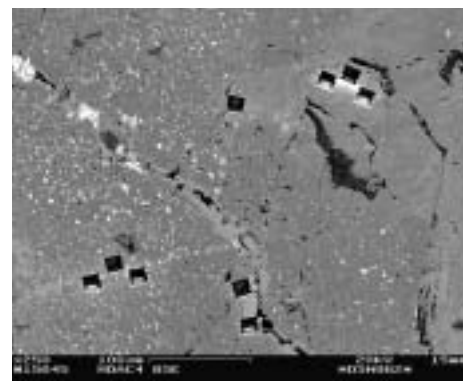
**Figure 1. Secondary electron image of 150-nm-thick foil within a milled pit in zircon.**

resolution) milling of materials. The material is most often removed by sputtering with an energetic beam of gallium or other ions that is focused to a spot size ranging between 0.05 and 1.0 micrometers. The micromachining capability of the FIB was first exploited by Overwijk *et al.* (1993) to cut thin foils from selected sites in integrated circuits for transmission electron microscope (TEM) studies. Since this development, the FIB has been used extensively in the semi-conductor industry and more recently in the Earth sciences for the preparation of TEM specimens (e.g., Heaney *et al.* 2001, Wirth & Rocholl 2003). Figure 1 is a secondary electron image of a 150-nm-thick TEM foil within a trench that was milled from a polished thin section of zircon from the Georgeville granite, Nova Scotia.

The selective extraction of minute specimens is also useful for analysis by techniques other than TEM. Such precise sample preparation may be needed in cases where the analytical volume of an *in situ* microanalytical technique, such as PIXE, SXRF, LA-ICP-MS or SIMS, exceeds the scale of heterogeneity of the sample. For example, a high-energy proton or X-ray microbeam may

interact with one or more compositional zones, intergrowths, micro-inclusions, etc. as it penetrates several tens of micrometers into the material. The spectrum obtained will therefore consist of various contributions from the different materials ionized by the beam.

Figure 2 is a backscattered electron (BSE) image of a metamict zircon containing numerous, minute, Th-rich inclusions and zones of alteration. The rectangular pits on the surface of the section mark the different sites from which thin slices were cut for chemical analysis. Some of the zircon foils reveal submicrometer-size inclusions and patchy zones, which may be separately analyzed with a suitable, high-resolution micro-analytical technique.



**Figure 2. BSE image of a zircon. The rectangular pits mark the sites where thin foils were cut using a focused ion beam.**

We have recently used the FIB at the GeoForschungsZentrum, Potsdam to micro-machine diamond anvils in a hydrothermal diamond anvil cell. The hydrothermal diamond anvil cell (HDAC) was designed and constructed specifically for the purpose of

*Continued on page 4*

<sup>1</sup> Dept. of Earth Sciences, St. Francis Xavier University, Antigonish, Nova Scotia B2G 2W5, aanderso@stfx.ca

<sup>2</sup> GeoForschungsZentrum, Potsdam, Germany

## SUMMARY

Feature **1**

From the Newsletter Editor **2**

Editorial **3**

A plea to build the MAC Foundation

Association News **5**

Council Meeting Highlights **5**

2002 Financial Statements **6**

Publications News **8**

Vancouver 2003 **12**

2003 Award Winners **13**

Students' Page **16**

People behind Mineral Names **17**

David London

Obituaries **18**

Marcelle Weber

Member in the News **19**

Pegmatite Workshop **20**

Conference Reports **21**

Sustainable Development

Metals in the Environment

Outside News **22**

This Newsletter constitutes an insert to  
*The Canadian Mineralogist*,  
Volume 41, Part 4

## FROM THE NEWSLETTER EDITOR

Newsletter 70 offers a mix of interesting articles plus the usual reports following our annual meeting. Several feature articles have been promised for the near future, but I am really pleased that this essay by Alan Anderson and Richard Wirth on micromachining with a focused ion beam came through.

### Japan

My trip to Japan was wonderful. I was amazed at how nice the people were to us. Traveling with my son was also a very positive experience. It brought us closer and now we have all these memories to share. On a geological note, we did visit Mount Aso but unfortunately, the crater accessible to visitors was blanketed in heavy fog. For the remainder of

the trip, Thomas lugged a large piece of volcanic rock from the summit of Mount Aso for his dad.

### Au revoir Marcelle

We say goodbye to Marcelle Weber, long-time member and supporter of MAC (see Obituary p. 18). Marcelle and her husband Charles lugged MAC books and copies of various mineralogical magazines to all the mineral shows they attended, to offer them to the mineral collecting community. The first time I met Marcelle was at the Tucson Gem and Mineral Show in 2000. Marcelle was so enthusiastic about her collecting trips to Mont St-Hilaire that I promised myself that I should really try to go, but I never did. So I will never have a chance to follow her around the quarry



Thomas at a lava shelter on Mount Aso

and benefit from her expertise. The last time I saw Marcelle was last April at the Rochester Mineralogical Symposium. She and Charles spent much of their time selling books at their booth while the rest of us enjoyed the symposium. How I wish I had offered to help!

### More Color

You might have noticed that Newsletter 69 had twice as much color as previous newsletters (eight pages instead of four) and that we have a new printer. I

*Continued on page 3*

# S<sup>3</sup>

## Sulfides, structures, and synchrotron light

*A symposium in honour of Mike Fleet*

This two-day symposium is being held to honour the recent retirement of Mike Fleet from the Department of Earth Sciences, UWO. In keeping with Mike's research interests, the symposium will feature both oral and poster presentations from invited and contributing authors on such diverse topics as experimental PGE geochemistry, crystal chemistry/crystallography, and diffraction and synchrotron radiation studies of minerals and mels.

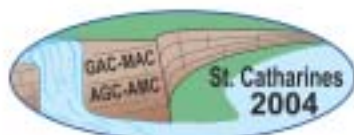
Past and present colleagues, collaborators, and students of Mike Fleet are encouraged to submit an abstract. We plan to publish contributions in a special issue of *The Canadian Mineralogist*.

Persons intending to make a submission are asked to notify Grant Henderson (e-mail: [henders@geology.utoronto.ca](mailto:henders@geology.utoronto.ca)) as soon as possible.



#### Contact:

Grant Henderson  
Department of Geology  
University of Toronto  
22 Russell St.  
Toronto, ON, M5S 3B1  
Phone: 416-978-6041  
Fax: 416-978-3938



May 12-14, 2004



**Mineralogical  
Association of Canada**  
Association minéralogique  
du Canada

**E-mail:** canmin.mac.ottawa@sympatico.ca

**Web:** www.mineralogicalassociation.ca

The Mineralogical Association of Canada was incorporated in 1955 to promote and advance the knowledge of mineralogy and the related disciplines of crystallography, petrology, geochemistry, and economic geology.

Any person engaged or interested in the fields of mineralogy, crystallography, petrology, geochemistry, and economic geology can become a member of the Mineralogical Association of Canada. Membership benefits include six issues a year of *The Canadian Mineralogist*, free access to the electronic version of the Journal, a 20% discount on publications of the Association and a discount on the registration fee at our annual meeting held jointly with the Geological Association of Canada.

Membership dues for 2004 are \$90. Membership dues for students and retired individuals are \$30 a year. Dues are in CDN\$ for Canadian memberships and in US\$ for memberships outside Canada.

Institutions and corporations may subscribe to *The Canadian Mineralogist* for US\$390 a year (outside Canada) or CDN\$390 (in Canada). Subscription includes site-license access to the electronic version at no additional cost to the institution. Institutions and corporations may also become a sustaining member of the Association for \$600 a year.

**President:** Norm M. Halden, University of Manitoba, MB

**Past President:** Brian Fryer, University of Windsor, ON

**Vice-President:** Daniel J. Kontak, Nova Scotia Department of Natural Resources, NS

**Secretary:** Andy McDonald, Laurentian University, ON

**Treasurer:** Mati Raudsepp, University of British Columbia, BC

The MAC Newsletter is published three times a year by the Mineralogical Association of Canada as a service to its members and subscribers.

**Send articles for the Newsletter to the Editor:**

Pierrette Tremblay  
1260 de la Chaudière  
Saint-Rédempteur, QC, G6K 1C5  
**E-mail:** mac.amc1@sympatico.ca

**Contributors to this issue:**

Alan J. Anderson, Dolores Durant, Al Forster,  
Gina LeCheminant, Robert F. Martin, Maryse Ohnenstetter,  
Dogan Paktunc, Jeremy Richardson,  
Iain Samson, Quintin Wight, Richard Wirth

**Revision:** Thomas Clark, Dolores Durant

**Layout:** Info 1000 Mots Inc.

**Printer:** J.B. Deschamps Inc.

The opinions expressed in this Newsletter are those of the authors and do not necessarily reflect the views of the Mineralogical Association of Canada.

**Deadlines for the next Newsletters:**

October 15, 2003 and February 15, 2004.

ISSN 0076-8936.

**MAC Newsletter  
Number 70, August 2003**

**Publisher:**

Mineralogical Association  
of Canada  
P.O. Box 78087  
Meriline Postal Outlet  
1460 Merivale Road  
Ottawa ON K2E 1B1 Canada  
Tel. and fax: 613-226-4651

## EDITORIAL

### A PLEA TO BUILD UP THE MAC FOUNDATION

BY GINA LECHÉMINANT

During my tenure of some thirteen years on Executive Council, four things stand out for me – changes that I supported, promoted, or even instigated. I want to remind you of those changes because I believe they have transformed the Mineralogical Association of Canada into what it is today.

First, Council balanced the budget in a time of declining reserves. This was controversial, as it required increasing dues for both personal and corporate or library memberships, and lowering journal costs in an environment of increasing expectations for quality and color. These decisions risked the core membership of the Association, but the outcome proved the risk worth taking.

Second, Council took the conscious decision not to anticipate a surplus from its support of Canada's premier geoscience meeting held jointly with the Geological Association of Canada. This permits budget forecasting that includes the risk of loss, but permits the Association to invest any meeting surplus in support of its charitable purpose.

Third, Council transformed the business model of the Association into what it is today. This was an important philosophical shift that recognized MAC is

not just a dues club that provides its members with *The Canadian Mineralogist*. It is, instead, an entity with a dual purpose: to provide member services, and to efficiently run a small international publishing house. Recognizing this duality permits Council to commit fully to its charitable endeavour, and at the same time plan its publishing future according to sound business principles.

Last, and perhaps what I am most proud of, was the establishment of a separate charitable entity, the Mineralogical Association of Canada Foundation, to provide scholarship awards and other financial support to graduate students pursuing geoscience research in all the areas promoted in *The Canadian Mineralogist*. The Foundation holdings now stand at some three hundred and fifty thousand dollars and support one major scholarship grant per year as well as travel grants for students to the GAC-MAC annual meeting and other meetings such as the IMA. In the coming year, the Foundation will mount a matching-dollar campaign to increase its holdings, with a short-term target of a half-million dollars and a longer-term target of one million dollars. I remain on the Board of Directors of the MAC Foundation, and I am making a personal request to you today to support, personally and in your place of work, this fund-raising campaign when it is launched.

#### FROM THE... (Continued from page 2)

asked J.B. Deschamps – our new printer for *Canadian Mineralogist* – for a bid for the newsletter and was happily surprised that their bid was the lowest. Because they print on a larger press, we can have twice as much color at a lower cost!

#### And the Winner is ...

There were two entries in my little contest in the previous newsletter. As one was from Canada and the other from the Netherlands, I thought that both contestants deserved a prize. So congratulations to Maureen Johnston

and Diederik Visser, who will both get a MAC publication of their choice. The band at the top of Newsletter 69 was taken from Figs. 2A and 2B in the article entitled **Phase-equilibrium constraints on the magmatic origin of laurite + Ru-Os-Ir alloy**, by David R.A. Andrews & James M. Brenan, *Canadian Mineralogist*, 40, 1705-1726 (2002).

So the contest is on again, but there will be only one winner this time: which picture did we use for the color band at the top of this newsletter? Please send your entry before November 15.

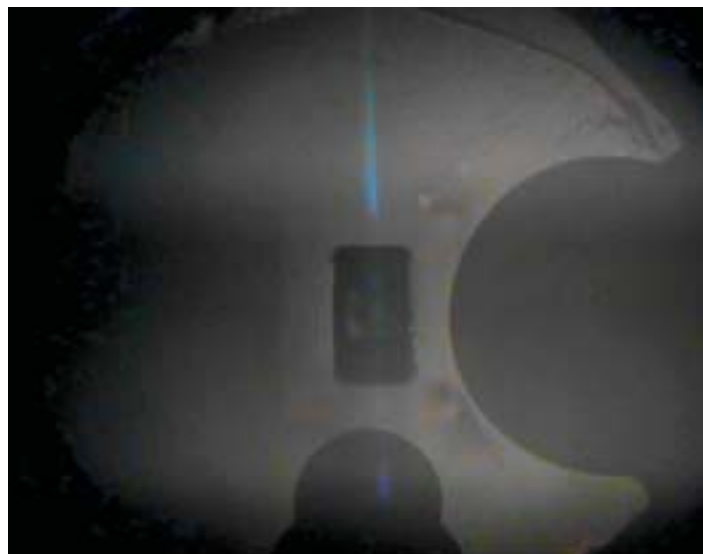
*Pierrette Tremblay*



**FEATURE** (Continued from page 1)

making observations on fluid and fluid plus solid samples at high temperatures and pressures. Bassett *et al.* (2000) and Anderson *et al.* (2002) modified the HDAC by laser drilling a sample chamber and grooves into the diamond anvil to enhance the transmission of X-rays entering and exiting the fluid sample chamber. Precise milling of diamond with a FIB is useful for removing the exact amount of diamond to optimize X-ray transmission without compromising the strength of the anvil. Figure 3 shows the visible fluorescence of the X-ray beam as it travels through the diamond and the rectangular sample chamber, which was milled using a focused ion beam.

It is also important in X-ray spectroscopic experiments with the HDAC to observe phase behavior within the sample cham-



**Figure 3. Photograph showing visible fluorescence of an X-ray beam in the diamond anvil. The rectangular sample chamber was milled using a focused ion beam.**

ber as temperature and pressure are changed. However, the optical quality of a laser-ablated sample chamber is generally non-

optimal due to the irregular surface of the floor. This problem is overcome by milling a sample chamber with a focused ion beam. Figure 4 shows a pit (114 x 108 x 65 micrometers) that was cut within 114 hours (FEI FIB200, Ga-source, 30kV, 11500pA). The smooth floor produced by FIB milling provides excellent observation of the contained sample

using a transmitted-light microscope. The precise machining of diamond as shown here opens new opportunities for designing diamond anvils to be used with various *in situ* microanalytical probes.

**References**

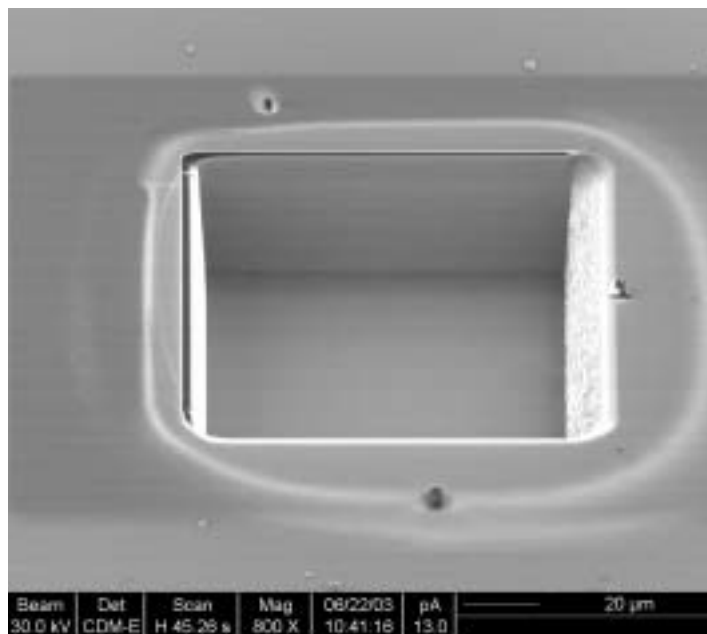
ANDERSON, A.J., JAYANETTI, S., MAYANOVIC, R.A., BASSETT, W.A. & CHOU, I.-M. (2002): X-ray spectroscopic investigations of fluids in the hydrothermal diamond anvil cell: The hydration structure of La<sup>3+</sup> from ambient to 300 C and 1600 bars. *Am. Mineral.*, **87**, 262-268.

BASSETT, W.A., ANDERSON, A.J., MAYANOVIC, R.A. & CHOU, I.M. (2000): Hydrothermal diamond anvil cell for XAFS studies of first-row transition elements in aqueous solution up to supercritical conditions. *Chem. Geol.*, **167**, 3-10.

HEANEY, P.J., VINCENZI, E.P., GIANNUZZI, L.A. & LIVI, K.J.T. (2001): Focused ion beam-milling: a method of site-specific sample extraction for microanalysis of Earth and planetary materials. *Am. Mineral.*, **86**, 1094-1099.


OVERWIJK, M.H.F., VAN DEN HEUVEL, F.C. & BULLE-LIEUWMA, C.W.T. (1993): Novel scheme for the preparation of transmission electron microscopy specimens with a focused ion beam. *Jour. Vac. Sci. Technol.*, **11**, 2021-2024.

WIRTH, R. & ROCHOL, A. (2003): Nanocrystalline diamond from the Earth's mantle underneath Hawaii. *Earth and Planet. Sci. Lett.*, **211**, 357-369.



**Figure 4. Secondary electron image of a rectangular pit in diamond tilted about 45°.**

Pegmatite  
Interest  
Group



"Get PIG-headed."

© 2002 David London

Are you interested in the mineralogy and geology of pegmatites? If so, visit the website for the Pegmatite Interest Group (PIG), hosted by the Mineralogical Society of America at

<http://www.minsocam.org/msa/Pegmatites.html>

Keep up on news, events, & information about pegmatites and their minerals. Current postings include a field guide to pegmatites in Madagascar, a report on a new elbaite-bearing pegmatite in the Italian Alps, and weekly updates on gem mining at the Cryo Genie pegmatite, southern California.

Send contributions to the PIG site in electronic formats only to Dr. David London (editor and MSA representative) at

dlondon@ou.edu

## ASSOCIATION NEWS

### COUNCIL MEETING HIGHLIGHTS

BY PIERRETTE TREMBLAY  
EXECUTIVE COORDINATOR

Council met on May 24 and 25 in Vancouver, prior to MAC's annual meeting held jointly with the Geological Association of Canada and the Society of Economic Geologists. We welcomed incoming Councilors Cliff Shaw, from the University of New Brunswick; David Fowle, from the University of Windsor; and André Lalonde, from the University of Ottawa to their first Council meeting.

#### A surplus in 2002

With a surplus of \$77,000 in 2002, the financial situation of MAC continues to be healthy. It was therefore an appropriate time to transfer some of the surplus accumulated over the years to the Mineralogical Association of Canada Foundation. The Foundation, whose main activity is to raise and disburse funds for the support of scholarships and other activities to assist students in their research work, was incorporated in 1997, following a recommendation from the Finance Committee. Council voted to transfer \$100,000 to the MAC Foundation immediately, and an additional \$100,000 was put aside to use as fund-raising leverage for the Foundation. As MAC President Norm Halden pointed out, this is our "insurance" that come lean years, we will still be able to maintain our charitable activities. Council was brimming with ideas to do more if we had more money in the Foundation. Travel scholarships and two new student research grants will be awarded for the first time next spring.



From left to right, incoming Councilors David Fowle, André Lalonde, and Cliff Shaw, with student Councilor Alison Rust (University of Oregon).

#### Looking into the future

Several factors might impact seriously on our income base in the coming years and we are keeping a close watch on them. In 2003, the bankruptcy of one of our main book agents RoweCom/Faxon/divine will affect our income base. Most libraries deal with book agents to renew their journal subscriptions. In this way, they deal with one person rather than dozens of publishers. About twenty of our institutional subscribers have paid their 2003 subscription to RoweCom but RoweCom did not forward the money to us. As you might expect, libraries are in no position to pay a subscription fee twice. We are gracing these subscriptions for 2003, hoping that these long-time subscribers will renew in 2004.

Another factor that might reduce our yearly surplus in 2004 is the increasing strength of the Canadian dollar. In January 2002, the Canadian dollar reached a low of US\$0.6381. In June 2003, it reached US\$0.7512 and it is currently worth about US\$0.71.

A large part of our income is derived from American and overseas institutional subscriptions, which are usually received in the fall of the previous subscription year and are paid in US dollars. With the current exchange rate, an estimated \$30,000 less will be in our coffers. The low value of our Canadian dollar has been a real boon for MAC in recent years, and this has made us realize to what extent balancing our budget has been dependent on our US sales.

Another factor that will come to bear starting in 2005 is Geoscience World. As you can read on page 8, this is an initiative spearheaded by GSA to develop an aggregate of online geoscience journals published by societies, university presses, and a few small commercial publishers. MAC has expressed interest in *Canadian Mineralogist* being part of this aggregate, as it seems that we have to join this bandwagon. But this could change the way we do business in a very significant way. The

income we will derive from this consortium is very uncertain, but we think it will be significantly less than the income we derive from library subscriptions. Currently, 56% of our total yearly income is derived from institutional subscriptions and 10% from individual memberships. There are many unknowns: for example, how many libraries will choose electronic-only subscriptions? at what rate will libraries let go of print subscriptions?, etc. We have been told that the demand for print will remain strong initially, but will gradually decrease until a time X at which point it will drop very suddenly. The experience of the people around the Council table was such that we do expect a rapid drop in the demand for print. Several Canadian universities have already made it a policy to drop print subscription when a reliable electronic version becomes available.

#### No Fee Increase in 2004

For the third year in a row, the institutional subscription price will remain at \$390, and for the fifth year, individual membership costs will remain at their current level.

#### Fundraising Campaign

MAC will match any donation to the MAC Foundation, up to a total amount of \$100,000 for all donations. To increase the profile of the mineral sciences, we have to invest in young people, and this is what we plan to do by awarding travel scholarships and research scholarships to deserving candidates. We ask you to seriously consider a donation to the Foundation when we send an appeal letter with the membership renewal in November.

## ASSOCIATION NEWS

### 2002 FINANCIAL STATEMENTS

As our by-laws require, we hereby publish our 2002 financial statements. Please take the time to look at them.

#### Auditor's report

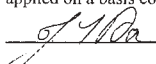
To The Members  
The Mineralogical Association of Canada

I have audited the balance sheet of **The Mineralogical Association of Canada** as at December 31, 2002 and the statements of receipts and disbursements members surplus and changes in cash for the year then ended. These financial statements are the responsibility of the society's management. My responsibility is to express an opinion on these financial statements based on my audit.

Except as explained in the following paragraph I have conducted my audit in accordance with generally accepted auditing standards. Those standards require that I plan and perform an audit to obtain reasonable assurance whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation.

In common with many charitable organizations, the organization derives revenue from donations, the completeness of which are not susceptible to satisfactory audit verification. Accordingly, my verification of these revenues was limited to the amounts recorded in the records of the organization and I was not able to determine whether any adjustment might be necessary to donation revenues, excess of expenses over revenue, assets and surplus.

In my opinion, except for the effect of adjustment, if any, which I might have determined to be necessary had I been able to satisfy myself concerning the completeness of the donations referred to in the preceding paragraph, these financial statements present fairly, in all material respects, the financial position of the society as at December 31, 2002 and the results of its operations and the changes in its financial position for the year then ended in accordance with generally accepted accounting principles, as disclosed in Note 2 to the financial statements applied on a basis consistent with that of the preceding year.

  
Joanne L. Dorman  
Chartered Accountant  
June 9, 2003

Vancouver, BC

#### The Mineralogical Association of Canada Balance Sheet As at December 31, 2002 (with comparative figures as at December 31, 2001)

	2002	2001
<b>Assets</b>		
<b>Current</b>		
Bank (Note 4)	\$ 129,740	\$ 36,446
Short-term investments (Note 5)	290,000	15,000
Accounts receivable	23,101	124,410
Accrued interest receivable	10,492	6,786
Due from the MAC Foundation	21,678	2,400
Prepaid expenses	16,158	10,630
	491,169	195,672
<b>Marketable securities (Note 5)</b>	361,654	539,695
	\$ 852,823	\$ 735,367
<b>Liabilities &amp; Members' Equity</b>		
<b>Current</b>		
Accounts payable and accrued liabilities	\$ 77,277	\$ 76,961
Deferred revenue (Note 3)	52,277	12,264
	129,554	89,225
<b>Surplus</b>		
Members' equity	723,269	646,142
	\$ 852,823	\$ 735,367

#### The Mineralogical Association of Canada Statement of Receipts and Disbursements and Members' Surplus For the year ended December 31, 2002 (with comparative figures as at December 31, 2001)

	2002	2001
<b>Revenue</b>		
Membership dues	\$ 326,416	\$ 286,933
Meetings	32,816	46,139
Publications	69,603	80,425
Short course notes	37,467	46,931
Donations	12,889	14,614
Investment income	38,165	42,422
	517,356	517,464
<b>Expenditures</b>		
Berry Summer School	1,450	-
Business office	57,612	56,740
Grants & awards	15,075	16,579
Membership	10,543	6,398
Meetings	19,274	11,228
Miscellaneous	5,268	10,764
Other administration	74,053	65,413
Publications	224,460	242,355
Publicity	12,037	15,830
Short course notes	20,457	25,962
	440,229	451,269
<b>Net income for the year</b>	77,127	66,195
<b>Members' surplus, beginning of year</b>	646,142	579,947
<b>Members' surplus, end of year</b>	\$ 723,269	\$ 646,142

#### The Mineralogical Association of Canada Statement of Cash Flows For the year ended December 31, 2002 (with comparative figures as at December 31, 2001)

	2002	2001
<b>Cash flows from operating activities:</b>		
Excess revenue over expenditures	\$ 77,127	\$ 66,195
Changes in non-cash working capital		
Marketable securities	(275,000)	88,000
Short-term investments	275,000	(88,000)
Accounts receivable	101,309	(94,195)
Accrued interest receivable	(3,706)	(1,895)
Due from related parties	(19,278)	(2,400)
Prepaid expenses	(5,527)	(556)
Accounts payable and accrued liabilities	315	21,865
Due to MAC Foundation	-	(69,742)
Deferred revenue	40,013	(139,098)
	190,253	(219,826)
<b>Cash flows from financing activities:</b>		
(Purchase) Disposal of marketable securities	(96,959)	(13,390)
<b>Increase (decrease) in cash</b>	93,294	(233,216)
<b>Cash at beginning of year</b>	36,446	269,662
<b>Cash at end of year</b>	\$ 129,740	\$ 36,446



## ASSOCIATION NEWS

### The Mineralogical Association of Canada Notes to the Financial Statements As at December 31, 2002

#### 1. Purpose of the Organization

The Association was incorporated on August 5, 1955, by Letters Patent under the Canadian Corporations Act for the purposes of advancing knowledge in crystallography, geochemistry, mineralogy, petrology, mineral deposits and allied sciences. The Association is incorporated without share capital. The Association is a registered charity under the Income Tax Act.

#### 2. Summary of Significant Accounting Policies

The accounting policies of the society are in accordance with generally accepted accounting principles. Outlined below are the policies considered particularly significant.

##### Foreign Currency Translation

The Association follows the Temporal method of translation whereby:

- i) balance sheet items are translated at the rate of exchange in effect at the balance sheet date;
- ii) revenue and expense items are translated at the rate of exchange in effect on the dates they occur.

Any gains or losses are charged directly to income.

##### Marketable Securities

Marketable securities are valued at cost, unless circumstances have indicated an impairment in value which necessitates a write-down to net realizable value.

##### Capital Assets

Capital assets are expensed on acquisition. No capital assets were purchased during the year.

##### Revenue Recognition

The Association uses the accrual basis of accounting, matching revenue with expenditures.

#### 3. Deferred Revenue

	2002	2001
Prepaid membership dues	\$ 52,277	\$ 12,264
	\$ 52,277	\$ 12,264

#### 4. Bank - consists of:

	2002	2001
Deposit on hand	\$ -	\$ 2,012
Operating account - Canadian dollar	45,535	16,345
Operating account - US dollar	17,868	2,407
Visa account	11,434	2,489
Mastereard account	19,026	4,817
RBC Dominion - cash account	35,877	8,376
	\$ 129,740	\$ 36,446

#### 5. Marketable Securities - consists of:

	2002	2001
Marketable securities	\$ 361,654	\$ 539,695
Short-term investments	290,000	15,000
Total marketable securities - cost	\$ 651,654	\$ 554,695
Total marketable securities - market	\$ 670,736	\$ 576,037

#### 6. Inventories

The Association's inventories consist of short course notes, back issues and special publications which are available for future sale. Due to the nature of the inventories, the costs are expensed as incurred when preparing short courses and publications and revenue is recognized when realized. The cost of inventories on hand is estimated by management to be \$ 749,848.

# MinIdent-Win

## - The World's Leading Mineral Identification Software -

A completely up-graded version of the original ground-breaking program, now redeveloped for Windows™ platforms.

### Features:

- An up-to-date database including the IMA-approved minerals and ~1000 unnamed minerals
- Identification on the basis of composition, X-ray data (d-values), cell dimensions, symmetry, indices of refraction, thin section colour and pleochroism, optic sign, optic axial plane orientation, dispersion of the optic axes, reflection percentages at 4 standard wavelengths, density, Mohs' & Vickers' hardness
- Automated identification from composition for electron beam analyses
- Identification from hand specimen properties for >600 of the more common minerals (colour, lustre, streak, habit, mode of aggregation, tenacity, fracture, cleavage, twinning, fluorescence characteristics)
- More than 600 high-resolution images of common minerals
- Collections facility for unlimited incorporation of users' information and images
- Synonymy containing varietal, discredited and superceded names, leading to the approved name.
- A highly intuitive interface but with 3 levels of easy-to-use help built-in
- Annual up-dates at modest cost
- Professional, Collector and Student editions available
- The prices..... for a very pleasant surprise, and to place orders, please visit our web site at:

[www.micronex.ca](http://www.micronex.ca)

No professional involved in any way with mineral identification can afford to be without this software

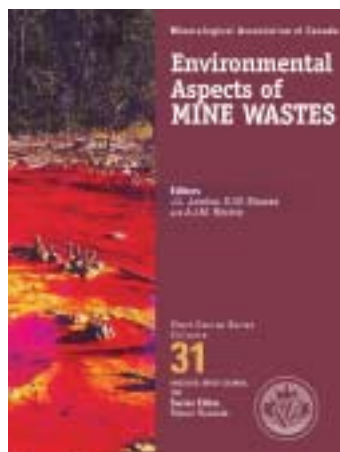
**Micronex –  
serving the  
Scientific  
Community  
for 20 years**

Windows™ is a registered trademark of the Microsoft Corporation

PUBLICATION NEWS

**Environmental Aspects of Mine Wastes: A New Volume**

Much has been learned about the environmental aspects of mine wastes since the Mineralogical Association of Canada held its 22<sup>nd</sup> short course on *Environmental Geochemistry of Sulfide Mine-Wastes* in 1994. When the accompanying volume to that short course, Short-Course Volume 22, went out of print, we consulted John Jambor about the feasibility of reprinting it, or perhaps updating it. Because of all the advances in the field in the previous decade, John did not feel it would be appropriate to reprint. Updating could not have been done without a complete re-write of much



of the 1994 text. We are very privileged that John agreed to organize a new short course along with David Blowes and Ian Ritchie, and to produce a new short-course volume entitled

*Environmental Aspects of Mine Wastes*. Several of the contributors have emphasized the decade's progress and new developments in the field of mine-waste studies.

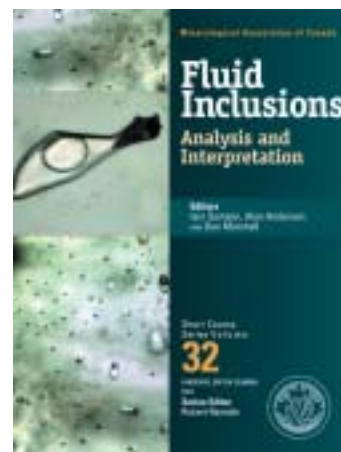
In the preface of Short-Course Volume 31, the organizers mention two examples of the significant changes that have taken place over the past decade. On the micro scale, there has been an increased use of various spectroscopic techniques for characterization of the mineralogy ensuing from reactions that occur at the surfaces of sulfides and other minerals, as well as identification of the nature of the products that have precipitated from acid mine drainage. On the macro scale, the Rum Jungle site has provided a "real life" rather than simulated example of what happens in sulfidic waste-rock piles over the long term, and of the effects that result from the emplacement of caps on such a pile.

The 450-page volume is a must for all interested in mine-waste management.

**Fluid Inclusions: Analysis and Interpretation – A New Volume**

By IAIN SAMSON

A short course on fluid inclusions was first run by the Mineralogical Association of Canada in 1981 and was accompanied by the publication of volume 6 of the Association's short-course notes. In the intervening twenty-two years, there have been many advances in the area of fluid and melt inclusions. In light of this, the Association once again sponsored a fluid inclusion short course at this year's joint annual meeting in Vancouver. This short course, entitled *Fluid inclusions: Analysis and Interpretation*, was organized by Iain Samson (University of Windsor), Alan Anderson (St. Francis Xavier University), and Dan Marshall (Simon Fraser Uni-



versity). Fourteen talks were given over two days by experts in fluid and melt inclusions. These talks covered the gamut of fluid inclusions research, from fundamental concepts to state-of-the-art chemical analysis and modeling, and included: how inclusions form; the fundamentals of petrographic analysis; introduction to aqueous, gas-bearing, petroleum and melt inclusions; bulk methods of chemical analysis; and various microbeam analytical methods.

The notes accompanying the course have been published as Short-Course Volume 32, and have been edited by Samson, Anderson, and Marshall. A glossary of terms by Larry Diamond has been included. The volume is accompanied by a CD that will contain computer software for fluid inclusion modeling, as described in the chapter by Bakker and Brown, as well as digital versions of all the figures from the volume, which can be used in teaching presentations. We are also very pleased to have included the PDF files of the original Short-Course Volume 6, *Fluid Inclusions: Applications to Petrology*, which has long been out of print and very hard to obtain.

The chapters, which mimic the talks given at the course, are as follows:

1. Introduction to Fluid Inclusions – Robert J. Bodnar

ENVIRONMENTAL ASPECTS OF MINE WASTES	
Editors	
J.L. Jambor, D.W. Blowes, A.L.M. Ritchie	
TABLE OF CONTENTS	
PREFACE	11
1. CHALLENGES FACING BY METAL LEACHING AND ACID ROCK DRAINAGE, AND STRATEGIES USED TO ADDRESS THEM	1
W.A. Price	
2. GEOENVIRONMENTAL THREATS OF MINERAL DEPOSITS DERIVED FROM MASSIVE SULFIDE AND GOLD DEPOSITS	11
E.R. Seal II & J.M. Hetherington	
13. HYDROLOGICAL AND GEOCHEMICAL TRANSPORT PROCESSES IN MINE WASTE ROCKS	51
L. Smith & S. Beckie	
4. OXIDATION AND GAS TRANSPORT IN FIELD OF SULFIDE MINERAL	73
A.L.M. Ritchie	
5. MIC. TALKING: HYDROGEOLOGY AND GEOCHEMISTRY	91
D.W. Blowes, C.J. Price & J. Jambor	
6. MINE-WASTE STABILITY AND MINERALOGICAL PERSPECTIVES OF ACID – BASE NEUTRALIZATION	117
J.L. Jambor	
7. DEVELOPMENTS IN LEACHATE-CELL TESTS AND THEIR APPLICATIONS	147
E.A. Lapakko	
8. APPLICATION OF BETHEM ANALYSIS TO ENVIRONMENTAL MINERALOGY	169
M. Radzup & E. Furr	
9. MODEL MICROBIOLOGICAL TECHNIQUES TO CHARACTERIZE MINE WASTE	181
C.G. Wilcock	
10. THE MICROBIOLOGY OF ACID MINE DRAINAGE	185
W.D. Gould & A. Kapner	
11. EFFECTS OF MICROBIOLOGICAL AND GEOCHEMICAL INTERACTIONS IN MINE DRAINAGE	227
D.K. Wehrens	
12. GEOCHEMISTRY OF CONCENTRATED WATER AT MINE-WASTE SITES	239
C.J. Price & W.D. Blowes	
13. USE OF FIELD-SCALE EXPERIMENTS AND REACTIVE TRANSPORT MODELING TO EVALUATE MINERALIZATION AGONISTS IN STREAMS AFFECTED BY ACID MINE DRAINAGE	261
R.A. Kienast, S.L. Backel & E. Wilson-Dry	
14. ADVANCES IN REACTIVE-TRANSPORT MODELING OF CONTAMINANT RELEASE AND ATTENUATION FROM MINE-WASTE DEPOSITS	285
U. Mayer, D.W. Blowes & E.D. Ford	
15. STABLE-ISOTOPE CHARACTERIZATION OF MINE WASTES AND RELATED SITES	303
E.R. Seal II	
16. PASSIVE AND ACTIVE TREATMENT OF MINE DRAINAGE	323
K. Wilson-Dry	
17. TREATMENT OF MINE DRAINAGE USING PASSIVE REACTIVE MATERIALS	361
D.W. Blowes, J.G. Barr, D.J.A. Soper & C.J. Price	
18. THE DESIGN AND PERFORMANCE OF MINE-WASTE COVER SYSTEMS	377
G.W. Wilson	
19. THE RUM JUNGLE MINE – A CASE STUDY	385
A.L.M. Ritchie & J.W. Bennett	
20. EXTREME ACID MINE DRAINAGE FROM A PASSIVE ALKALINE SULFIDE DEPOSIT: THE BURN MOUNTAIN CASE-STUDY	417
C.N. Alpin, D.K. Northey & J. Spurling	



## PUBLICATION NEWS

2. Petrographic Analysis of Fluid Inclusions – Robert H. Goldstein
3. Systematics of H<sub>2</sub>O Inclusions – Larry W. Diamond
4. Interpretation of Data from Aqueous-Electrolyte Fluid Inclusions – Robert J. Bodnar
5. Introduction to Gas-Bearing Aqueous Fluid Inclusions – Larry W. Diamond
6. Petroleum Fluid Inclusions, an Introduction – Robert C. Burruss
7. Computer Modelling in Fluid Inclusion Research – Ronald J. Bakker and Philip E. Brown
8. Re-equilibration of Fluid Inclusions – Robert J. Bodnar
9. Bulk Analysis of Electrolytes in Fluid Inclusions – Sarah A. Gleeson
10. Bulk Analysis of Volatiles in Fluid Inclusions – Stefano Salvi and Anthony E. Williams-Jones
11. Raman Spectroscopy of Fluid Inclusions – Robert C. Burruss
12. LA-ICP-MS Analysis of Fluid Inclusions – Joel E. Gagnon, Iain M. Samson, and Brian J. Fryer
13. Electron, Nuclear and X-ray Probe Microanalysis of Fluid Inclusions – Alan Anderson and Robert Mayanovic
14. Melt (Glass ± Crystals) Inclusions – Fred Anderson

### Publication Grants from Natural Resources Canada

The Mineralogical Association of Canada gratefully acknowledges the funding received from Natural Resources Canada in the past two years. The first grant received helped offset the color costs of the *Cabri* issue. It was quite fitting to receive support from NRCan, in view of the fact that Louis Cabri's distinguished career was spent at CANMET, a branch of NRCan. The second grant was received early in 2003 and contributed towards the publication costs of *Mineral Species Discovered in Canada and Species Named after Canadians*. In browsing through this volume, one is reminded of the enormous contribution of the Geological Survey of Canada and its researchers in the quest to discover Canada and its geological heritage. Many eminent GSC employees have been singled out for recognition by having a mineral species named after them.

### On Electronic Submission

As electronic submission of manuscripts seems like the "in" thing to do, why is it that we have not moved swiftly to join the bandwagon?

In our current system, authors are asked to provide three "hard" copies, ready to be put in envelopes and mailed to an associate editor. This can be accomplished in a matter of minutes. When an article is submitted electronically, figures, photographs, graphs, and the text are typically submitted in a variety of software, requiring quite an investment in time (to print the thing out), and money (the proper software is required to open all these kinds of files). In a large organization involved in publishing many journals, a member of the staff can be delegated to carry this task out efficiently. But in a lean and mean organization like *The Canadian Mineralogist*, this step is an extra burden for the editor, who already accomplishes many daunting tasks. Furthermore, it is absolutely essential to send out a copy of the manuscript that is as impressive as possible, and thus apt to show the author's work in the best possible light. Figures and tables (and even text, in some cases) reproduced on a different printer and with the available software commonly seem less impressive than the author's original. In a field like ours, accents, symbols, and bars above numbers or letters may well drop out during the transfer, and create problems that did not exist in the author's original.

For exactly the same reason, we believe that it is too much of an imposition to send an associate editor or a referee an electronic copy of a manuscript. The time a manuscript spends in the mail system turns out to be a very small proportion of the time that elapses between submission and publication. Manuscripts spend much more time in the hands of reviewers, and in the hands of the author once the reviews are in. And once the revised article does come back to the editor, it gets slotted into the next issue immediately, and there is NO delay if the article is being submitted for a "normal" issue.

Manuscripts HAVE been submitted electronically to *The Canadian Mineralogist*. However at the risk of seeming retrograde, we strongly prefer to have the onus of preparing the "hard" copies remain with the author for the time being. In doing so, the author also works with the software he or she is most comfortable with and does not have to deal with a long list of specifications on how files have to be transferred and what software has to be used.

### GeoScience World

Geoscience World, an aggregate of online society journals in the Earth sciences, is expected to be launched in 2005. It aims to provide the most comprehensive and useful database of journals in the geosciences, with the widest potential access by researchers worldwide via the Internet. It is an initiative spearheaded by the Geological Society of America (GSA), the American Association of Petroleum Geologists (AAPG), and the American Geological Institute (AGI). Four other societies have been added to the founding members to form the steering committee: the Geological Society of London (GSL), the Mineralogical Society of America (MSA), the Society of Exploration Geophysicists (SEG), and the Society for Sedimentary Geology (SEPM). Various advisory committees have been set up to examine the various aspects of the project (technical, librarian, publishers), and a business plan will be presented to all societies that have expressed interest.

GeoscienceWorld is the answer from geosciences societies to the aggregates launched by commercial publishers and in other disciplines. More and more, researchers expect fully searchable journals all available on the same platform while libraries want to deal with aggregates to reduce the workload: indeed, it is just as much work to set up e-access to a single journal as to a multi-journal aggregate.

The initial launch will feature a Millennium Collection, which will consist of a full-text, online-accessible aggregation of geoscience journals issued since 2000. Features will include searching of full-text and figure captions for all journals in the aggregation, and of all geoscience literature through GeoRef, with linking between reference and cited articles through CrossRef. Other expected features include HTML and PDF (searchable) full text, searches using a controlled vocabulary, the ability to limit searches to subsets, clear identification of journal and society "brand" identity, public access to all abstracts, links to enhanced data sets, and a good overall look to pages. It will be modeled on BioOne, which was launched last year.

At this point, 31 journals have expressed interest in participating (including *Canadian Mineralogist*) and 14 others have asked to be kept informed, pending seeing the final business plan, expected later this fall.



## PUBLICATION NEWS

### NEXT MAY IN NIAGARA: BROCK 2004

BY KEVIN ANSDELL, CHAIR,  
GAC PROGRAM CHAIR COMMITTEE

St. Catharines, Ontario, will be the site of the next joint annual meeting of the Geological Association of Canada and the Mineralogical Association of Canada. The meeting will be held May 12-14, 2004, and will be hosted for the first time by the Department of Earth Sciences at Brock University. The local organizing committee has developed a fabulous technical program built around the meeting theme "Lake to Lake". This theme is obviously related to the geographic location of St. Catharines between Lake Ontario and Lake Erie, but also emphasizes the geological, hydrological, and environmental issues related to the origin, history, and future development of the Niagara Region that will be addressed at the meeting. However, the exciting program of symposia, special and general sessions, short courses, workshops, and field trips will also cover all aspects of the geosciences. The program is detailed at the conference website, [www.stcatharines2004.ca](http://www.stcatharines2004.ca).

The meeting will be held on Brock University's scenic campus, atop the Niagara Escarpment, in new lecture rooms equipped with modern projection facilities. All sessions, lunches, and social events will be within a few minutes walk of each other, thus creating an atmosphere ideally suited to the exchange of scientific ideas. The exhibits and poster sessions will be housed in a space large enough to allow the posters to remain on display for all three days of the conference. A poster presentation will thus get increased exposure, and remember that there will be a chance to win one of the prestigious Jerome H. Remick III poster awards worth up to \$1000. Affordable accommodations, including breakfast, will be available in the university's new residences.

St. Catharines is situated close to major airports in Toronto, Hamilton, and Buffalo. A short drive from Niagara Falls, the city is perfectly located to take advantage of the sights and sounds of the Niagara region. The Niagara Escarpment, a world heritage site, is responsible for a unique microclimate, which allows the growth of some of the finest vinifera grape varieties and the production of some of the best wine in the world. A "Geology and Wine" special session, a field trip, and an evening of wine tasting spon-

sored by a local winery should spark an interest in exploring some of the region's many wineries. Other activities for attendees and guests could include a short trip to view Niagara Falls, a play at the Shaw Festival in Niagara-on-the-Lake, a trip to the new casino in Niagara Falls, or a visit to the Welland Canal linking Lake Ontario and Lake Erie. In fact, this would be a great conference at which to rent a car because on-campus parking for conference registrants will be free.

Brock University, the Geological Association of Canada, and the Mineralogical Association of Canada invite you to this major geoscience conference. It should be a great experience! Information on the conference and the St. Catharines region is available at the website, [www.stcatharines2004.ca](http://www.stcatharines2004.ca). By joining the email list, you will receive notifications of changes to the technical program and reminders of significant deadlines for abstract submission or registration. We will see you there.

#### Mineralogical Association Canada Short Course INFRARED SPECTROSCOPY IN GEOCHEMISTRY EXPLORATION GEOCHEMISTRY & REMOTE SENSING

**GOALS** ..... To update graduate students  
researchers & professional geologists  
on the current theory & practice  
in infrared spectroscopy (IR)  
from the molecular to planetary scale.

**TOPICS** .....

- ▶ Fundamentals & instrumentation used in IR spectroscopy
- ▶ IR spectroscopy of minerals & glasses
- ▶ IR spectroscopy in ore deposit exploration
- ▶ IR spectroscopy in environmental remediation  
& much more....



**WHEN?** ..... May 10-11, 2004  
**WHERE?** ..... University of Western Ontario  
London Ontario, Canada

**OPPORTUNITIES TO PRESENT YOUR RESEARCH** ....  
A special session at the GAC-MAC annual meeting  
(St. Catharines, Ontario, May 12-14) will complement  
the short course.

**For further information** please contact:  
P. King, University Western Ontario, London ON, Canada  
[penny.king@uwo.ca](mailto:penny.king@uwo.ca),  
M. Ramsey, University of Pittsburgh, Pittsburgh PA, USA  
[ramsey@ivis.eps.pitt.edu](mailto:ramsey@ivis.eps.pitt.edu)  
G. Swayze, USGS, Denver CO, USA  
[gswayze@usgs.gov](mailto:gswayze@usgs.gov)  
**Additional information** will be posted on the MAC web site:  
[www.mineralogicalassociation.ca](http://www.mineralogicalassociation.ca)

## CALL FOR NOMINATIONS

### PAST-PRESIDENTS' MEDAL

The Past-Presidents' 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 Dr. Brian Fryer, Head, Metals Laboratory, Great Lakes Institute for Environmental Research, University of Windsor, 410 Sunset Ave., Windsor ON, N9B 3P4, by December 31, 2003.

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), Frank C. Hawthorne (1999), Greg Anderson (2000), Kurt Kyser (2001), John L. Jambor (2002), and Ed Ghent (2003).

### 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 medalist 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. Daniel Kontak, Nova Scotia Department of Mines, Halifax NS, B3J 2T9 by December 31, 2003.

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), Norman M. Halden (1999), Robert F. Martin (2001), Robert T. Downs (2002), and Gina LeCheminant (2003).

### PINCH MEDAL

The Pinch medal has been awarded bi-annually since 2001 to recognize major and sustained contributions to the advancement of mineralogy by members of the collector-dealer community. This medal is named for William Wallace Pinch of Rochester, New York, in recognition of his enormous and selfless contributions to mineralogy through the identification of ideal specimens for study and by his generosity in making them available to the academic community. Nominations for the medal are to be submitted to Dr. Peter

### 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 a 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 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), Lee Groat (1999), Greg Dipple (2000), James S. Scoates (2001), James Brenan (2002), and Al Meldrum (2003).

Nominations should be sent to Dr. Brian Fryer, Head, Metals Laboratory, Great Lakes Institute for Environmental Research, University of Windsor, 410 Sunset Ave., Windsor ON, N9B 3P4 by December 31, 2003.

Burns, Dept. of Civil Engineering and Geological Sciences, University of Notre Dame, 156 Fitzpatrick Hall, Notre Dame, Indiana 46556-0767, [pburns@nd.edu](mailto:pburns@nd.edu), by October 15, 2004. Each nomination should consist of a letter describing in detail the contributions of the nominee and a list of publications resulting from the nominee's contributions (the nominee is not required to be an author of these publications); additional supporting letters are welcome. The next medal will be awarded at the 2005 Tucson Gem and Mineral Show, AZ, following the selection of the recipient by the award committee and approval by MAC Council. Previous winners are Bill Pinch (2001) and Mark Feinglos (2003).



## ASSOCIATION NEWS

### VANCOUVER 2003: A SUCCESS STORY

The dust has now settled on the very successful Vancouver 2003 meeting. More than 1000 delegates attended 540 oral and 170 poster presentations organized into 6 symposia, 27 special sessions, and 9 general sessions.

The theme *Earth Science on the Edge* was judiciously exploited by the Technical Program Committee. Special thanks go to the Technical Program chairs Bob Anderson (GAC technical program), John Jambor (MAC technical program), Steve Rowins/Dirk Tempelman-Kluit (SEG technical program), and all session organizers. The contributions of organizers included suggesting the session topics, providing session descriptions for the Circulars, selecting keynote and other contributing speakers, adjudicating abstracts for inclusion in the session's oral and poster components, organizing the talk order, proofreading the abstracts, and keeping the meeting on time. Attendees appreciated the depth, diversity, and relevance of the program. As a partial record of the science presented, proceeding volumes will be published for almost a dozen of the topical sessions. Author's abstracts are available in printed, CD-ROM, and web-accessible formats (check out: [http://gac.esd.mun.ca/gac\\_2003/search\\_abs/program.htm](http://gac.esd.mun.ca/gac_2003/search_abs/program.htm)).



Many thanks on behalf of MAC Council to Cathy Hickson, Chair, and Greg Dipple, Vice-chair and MAC representative, and Steve Rowins, SEG chair, and to all volunteers for organizing and running such a great meeting.

#### From MAC's point of view

MAC sponsored two very successful courses prior to the GAC-MAC-SEG meeting. *Environmental Aspects of Mine Wastes*, organized by John L. Jambor, David Blowes, and Ian Ritchie, had 60 participants and 19 presenters. Participants came from as far as Mexico. *Fluid Inclusions: Analysis and Interpretation* had 39 participants and 12 presenters. Both short courses had an amazing

collection of speakers, the experts in their respective topics. Isn't this the main reason to attend a short course? It is a unique chance to be brought up to speed on a given topic by the experts in the field and to get a chance to meet all of them in a relaxed setting. MAC also sponsored and co-sponsored several symposiums and special sessions. You can read an account of some of them on page 20.



Bob Pinard, subscription manager, at the MAC booth at the Vancouver meeting. "It was so nice to have enough space to exhibit our books in an attractive display. It proved to be an excellent opportunity to meet and greet members of MAC and to introduce the Association to new people and show off publications." said Bob.



Vancouver 2003 was held at the Sheraton Hall Centre Hotel in downtown Vancouver.

## ASSOCIATION NEWS

### 2003 AWARDS WINNERS

One of the highlights of the annual meeting in Vancouver was the awards presentation at the MAC luncheon. We publish here some excerpts from the citations. Watch for full citations and responses in an upcoming issue of *The Canadian Mineralogist* or on our website.

#### Young Scientist Medal to Alkiviathes Meldrum

It may seem unusual to nominate a faculty member in a physics department for the Young Scientist Award of MAC.



However, Al Meldrum, from the University of Alberta, is a mineralogist with a broad interest in solid-state research who has made important contributions to both the mineralogical and materials sciences... Al's nomination not only recognizes a talented young scientist, but also demonstrates the broad applicability of an education in mineral sciences.

Al is a very gifted, careful, and dedicated scientist. He is an expert in many aspects of mineralogy and mineral characterization including, but not limited to, transmission-electron microscopy, X-ray diffraction, and chemical analytical techniques. His M.Sc. degree on the petrology of the Cartier Batholith was done at McGill University under the supervision of Bob Martin. Al then moved to the University of New Mexico, where he did his Ph.D. with Rod Ewing. Much of his Ph.D. research was focused on the effects of radiation on crystalline structures, with applications in the disposal of nuclear waste. He conducted novel experiments on ion-beam-induced amorphization of minerals such as monazite, apatite, zircon, hafnion, thorite, and titanite. His research has also included work on numerous non-mineral ceramics, which led to the establishment of relations between crystal chemical parameters and critical amorphization doses. His discoveries include a transient liquid-like state that occurs in the displacement cascades of zircon, hafnion, and thorite, as published in



The 2003 award winners: Kurt Kyser, Ed Ghent, Dan Kontak (MAC Vice-President and Hawley Medalist), Gina LeCheminant, Jaroslav Dostal, Norm Halden (MAC President), and Daniel Layton-Matthews (Foundation scholarship awardee).

*Nature*. In short, Al's research into the crystalline-to-amorphous transition in minerals has significantly advanced our understanding of this geologically important process. His research is also key to the development of ceramics for the containment of nuclear waste in a geological repository.

Al has found ways to apply techniques learned in his mineralogical research in diverse fields of science. Al worked with a group of physicists and materials scientists during his post-doc at Oak Ridge National Laboratory, where he continued to develop his ideas concerning nanoparticles and the crystalline-to-amorphous transition. He has made very significant contributions to our understanding of nanoparticles, which of course are of considerable importance in aspects of environmental geoscience. He has even used his techniques to study chemical banding in fish otoliths!

In summary, Al is an extremely talented and productive young mineralogist who will continue to make important contributions to science (geology, mineralogy, materials science or any other discipline that he turns his hand to). He is certainly considered as a top "prospect" in the mineral physics community, and he brings great distinction to Canadian science.

#### Past-Presidents' Medal to Ed Ghent

Ed Ghent is a rarity in metamorphic petrology. During his career, he has completed experimental studies of metamorphic processes, has been a recognized leader in the analysis of metamorphic rocks and minerals, and has conducted field studies in metamorphic terrains. He has integrated all these types of studies into a research program that has deciphered metamorphic processes in terrains around the world and in metamorphic rocks that range in grade from zeolite to granulite facies. Very few petrologists have expertise in as many fields of



Ed Ghent receiving the Past-Presidents' Medal from Past President Brian Fryer.

## ASSOCIATION NEWS

metamorphic petrology or have studied metamorphic processes over such a large range of metamorphic grade.

Perhaps his most significant theoretical contribution was his development of the plagioclase-garnet- $Al_2SiO_5$ -quartz geobarometer in the early 1970s. This geobarometer, in conjunction with the biotite geothermometer, provided metamorphic petrologists for the first time with a practical, widely applicable, and relatively reliable method for determining metamorphic conditions in amphibolite-facies terrains.

The experiments he performed in collaboration with Derrill Kerrick at Penn State helped calibrate the thermodynamic properties needed to calculate mixed-volatile equilibria. These studies complemented his work with Mavis Stout on fluid inclusions in metamorphic rocks. Ghent and Stout have made significant contributions to our knowledge of metamorphic fluids.

Ed has been instrumental in developing the electron-microprobe laboratory at the University of Calgary. He has also collaborated in isotope and trace element studies with Kurt Kyser and Philippe Erdmer in Canada and numerous other workers in the USA, New Zealand, and Europe. The analytical studies he has undertaken have resulted in a better understanding of the chemistry and mineralogy of metamorphic rocks.

In addition to his scientific work, Ed has made significant contributions to our science



Dan Kontak giving his acceptance speech.



Kurt Kyser receiving the Hawley Medal from President Norm Halden, while co-authors Jaroslav Dostal and Dan Kontak look on.

by serving on NSERC and Lithoprobe committees. He has also served on the MAC Council and has helped organize and deliver short courses for both MAC and GAC.

### Hawley Medal to Kontak, Dostal, Kyser and Archibald.

The Hawley Medal for the best paper published in Volume 40 (2002) of *The Canadian Mineralogist* is awarded to the contribution entitled "A petrological, geochemical, isotopic and fluid-inclusion study of 370 Ma pegmatite-aplite sheets, Peggys Cove, Nova Scotia, Canada". The authors are Daniel J. Kontak, Nova Scotia Department of Natural Resources, Jaroslav Dostal, Department of Geology, St. Mary's University, and T. Kurt Kyser and Douglas A. Archibald, Department of Geological Sciences and Geological Engineering, Queen's University.

The Hawley Medal committee noted that "when the conventional magmatic origin for the fluids associated with the genesis of pegmatites and aplites in the South Mountain Batholith was discounted on the basis of oxygen stable isotope data, the authors proposed a novel alternate model on the basis of a multi-method analytical approach that involved meticulous field work, petrography,

isotope geochemistry, mineral chemistry, Ar/Ar geochronology, and fluid inclusion work. The authors demonstrate that the fluids involved in the petrogenesis of the pegmatites and aplites were derived by the dehydration of metasedimentary enclaves present in the granites. The importance of this finding, along with the strength resulting from the integration of the multiple methods taken by the authors, make this manuscript a most remarkable contribution." In short this paper is a superb example of the scientific method in action! The manuscript is also superbly illustrated with numerous diagrams, excellent field photographs and photomicrographs and, of course, is clearly and logically written.

### Berry Medal to Gina LeCheminant

Gina LeCheminant was awarded the Berry Medal for her selfless service to the Mineralogical Association of Canada as a member of Council and Executive over an extended time period; in fact, she served as Councilor and Secretary for 13 years. In these roles, Gina brought to MAC Council meetings an important continuity and historical perspective of the organization that proved on many occasions to be a tremendous asset – the modern vernacular for this is corporate memory, as our current president Norm



## ASSOCIATION NEWS



**Gina LeCheminant giving her acceptance speech.**

Halden likes to remind us! From discussions with several of her contemporaries who shared the round table with Gina at MAC meetings, the unanimous consensus was that Gina is blessed with an unquavering spirit and was known to provide gentle prods on issues that she took to heart. In many cases these issues were somewhat contentious because they involved change. However, Gina realized that the 1990s were a time of change and that MAC, unlike the dinosaurs, did have a choice of how to embrace some of this change. Of particular relevance were the changes in how business was being done, which was somewhat foreign to the mineralogists and academics of the time. As it turns out, this foresight was to a large extent responsible for making MAC the financially healthy organization it is today. Thus, some might say that Gina was a visionary.

Gina continues to sit as Executive Secretary on the MAC Foundation, which she was instrumental in establishing. It is

because of the healthy finances of the Association, to which Gina contributed so much, that the organization is now able, through the MAC Foundation, to provide financial support to deserving, young promising individuals.

Whereas bigger and wealthier organizations provide such visionaries with stock options, big bonuses, use of their private jets, and lavish retreats, we hope that the Berry Medal for 2003 will be accepted by Gina as a

suitable proxy. It carries with it our deepest gratitude for her efforts to guarantee a bright future for the Mineralogical Association of Canada.

### Mineralogical Society of America and Geochemical Society Short Course

#### BIOMINERALIZATION

December 6-7, 2003

Silverado Resort, Napa Valley, California, 94558, U.S.A.

Over the course of Earth history, organisms have developed the ability to produce a wide variety of complex inorganic minerals. These biominerals often have sophisticated structures and can possess chemical compositions that reflect their environments of formation. The abundance of biominerals in modern water columns, sediments and the rock record extensively chronicle the intertwined roles of biota and environment. An example of the extent and impact of biomineralization processes is clearly demonstrated in the global balance of carbon. Biomineral precipitation has sequestered a significant portion of the earth's carbon into an inert geochemical reservoir over the course of 3.5 by. This link between earth and life has governed critical shifts in ocean and atmospheric chemistry throughout earth's history.

The immense complexity of natural systems has thwarted efforts to construct a fundamental understanding of the processes employed by organisms to control mineralization. The advent of powerful new experimental and theoretical methods in geochemistry and molecular biology has enabled the scientific community to witness the first glimpses of a revolution that will unravel the complexity of mineral assembly in biological and inorganic systems. These approaches will be required to obtain unambiguous models of mineralization that are rooted in kinetics and thermodynamic properties. Linking mineralization models with the biological processes will give a fundamental and microscopic understanding of how organisms organize elements into minerals and materials. With this understanding, we will be able to overcome many of the limitations on our ability to interpret and predict longer length- and time- scale phenomena that occur in biogeochemical systems.

The subject of biological mineralization is a growing research area, as new and more established scientists focus upon biogeochemical problems at the interface between earth and life. The earth sciences are uniquely positioned to play a central role in advancing this field. To this end, a primary goal of the short course is to bring the subject of biological mineralization into an educational forum that will establish the state of the field and show new avenues for research. Our approach is to introduce the concepts that are common to biological mineralization phenomena and then to examine the major mineralization processes and their impacts on earth history. We encourage the participation of scientists from a wide cross-section of earth, biological, and materials disciplines. The short course will be followed by Biomineralization Special Sessions at the American Geophysical Union Meeting in San Francisco, California. Topics and Speakers/Authors for the short course:

#### **Establishing Cross-Disciplinary Communication**

- Overview of biomineralization: Interface between earth and life - *Steve Weiner (Weizmann Institute) and Patricia Dove (Virginia Tech)*
- Principles of molecular biology and protein chemistry - *John Evans (New York University)*
- Principles of nucleation and growth - *Jim De Yoreo (Lawrence Livermore National Laboratory)*

#### **Biological Processes and Mechanisms**

- Biologically induced mineralization (with focus on microbes) - *Richard Frankel (California Polytechnic State University)*
- Boundary organized (with focus on microbes) - *Dennis Bazylinski (Iowa State University)*

- Mineralization in an organic matrix framework (with focus on vertebrates) - *Arthur Veis (Northwestern University)*
- Supplying the ions for biomineralization (with focus on corals/forams) - *Jonathan Erez (Hebrew University)*
- Mineralization inside vesicles (with focus on coccoliths) - *Jeremy Young (Natural History Museum of London) and Karen Henriksen (University of Copenhagen)*
- Silicification (with focus on diatoms, sponges) - *Carole Perry (Nottingham Trent University)*

#### **Biomineralization Impacts on Earth Environments**

- Biomineralization and evolutionary history of organisms - *Andrew Knoll (Harvard University)*
- Impacts of biomineralization on biogeochemical cycles - *Philippe Van Cappellen (University of Utrecht)*

**Conveners:** *Patricia M. Dove*, Department of Geological Sciences, Virginia Tech, Blacksburg, VA, *James J. De Yoreo*, Lawrence Livermore National Laboratory, Livermore, CA, and *Steve Weiner*, Department of Structural Biology, Weizmann Institute, Rehovot, Israel.

**Fees & Registration:** All inclusive registration fee covers short course sessions, hotel room for two nights (double occupancy), refreshments at breaks, Saturday lunch, evening banquet at Napa Valley Grill, transportation to restaurant, and *Reviews in Mineralogy and Geochemistry* volume. Professional Registration on or before 11/1/03: Member \$420; Non-member \$475; Student Registration: Member \$220; Non-member \$240. You can register online at the MSA Home Page (<http://www.minsocam.org>). Forms are available from the MSA Business Office, 1015 Eighteenth Street NW Suite 601, Washington, DC, 20036-5212, USA. Tel: 202-775-4344, Fax: 202-775-0018, e-mail: [business@minsocam.org](mailto:business@minsocam.org).

The course is sponsored in part by the U.S. Department of Energy, Office of Basic Energy Sciences, Chemical Sciences, Geosciences and Biosciences Division, in honor of Dr. William C. Luth. The Lawrence Livermore National Laboratory and Department of Geological Sciences at Virginia Tech are also providing support for the short course and graduate student registration waivers, respectively.

## STUDENTS' PAGE

### **Congratulations to our undergraduate award winners for 2002-2003.**

- Ahmed Ahmed, St. Mary's University
- Jeffrey Beirnes, University of Waterloo
- Allison A. Brand, University of British Columbia
- Kyl B. Chhatwal, Queen's University
- Emily Delahaye, University of Victoria
- Jesse L. Dykstra, Okanagan University College
- Ian Herman, Haileybury School of Mines
- Stephen L. Hinchey, Memorial University of Newfoundland
- Melissa D. Holt, Simon Fraser University
- Josée Labelle, Université du Québec à Trois-Rivières
- Jean-Francois Larivière, Université du Québec à Montréal
- Robert Lodge, Acadia University
- Aaron Jacob Lussier, University of Manitoba
- Beverly J.S.W. Mack, University of Calgary
- Christene Martin, St. Francis Xavier University
- James Morley, University of Regina
- Geoff Newton, Laurentian University
- James C. Ouellette, University of Guelph
- Jennifer Paradis, University of New Brunswick
- Ian Power, University of Western Ontario
- Genevieve Robert, McGill University
- Dawn Rusnak, Brock University
- Dave Saucier, École polytechnique
- Derek Smyth, University of Windsor
- Markus Sulans, Carleton University
- Breanna C. Uzelman, University of Saskatchewan
- Siobhan (Sasha) Wilson, McMaster University

The MAC Undergraduate Awards are given annually to undergraduate students for excellence in one of the fields covered by MAC (mineralogy, crystallography, petrology, geochemistry, and economic geology). The award consists of one free MAC publication and a one-year subscription to *The Canadian Mineralogist*. For more information on this program, contact Jeanne Percival at [jperciva@nrc.gc.ca](mailto:jperciva@nrc.gc.ca)

## MAC Travel Scholarships for Students

The MAC Foundation will award travel scholarship to assist honours undergraduate and graduate students in the mineral sciences to

- present their research at a conference (including regional student society conferences)
- attend a short course or a field trip relevant to their field of study
- visit a facility, laboratory or field area to gather data for their research

Scholarship will offer partial support, up to a maximum of CAN\$1000 or up to 50% of the cost incurred (whichever is smaller).

### ELIGIBILITY

- Graduate students and honours students at the undergraduate levels in one of the fields covered in *The Canadian Mineralogist* (mineralogy, crystallography, petrology, economic geology and geochemistry).
- The applicant is a student member of MAC.
- Scholarship recipients will submit a report of their research activities for possible publication in the MAC Newsletter.

**DEADLINE FOR APPLICATIONS: JANUARY 15, 2004.  
SCHOLARSHIP RECIPIENTS WILL BE NOTIFIED BY MARCH 15.**

Check our website [www.mineralogicalassociation.ca](http://www.mineralogicalassociation.ca) for details of the application process, which will be posted as soon as they are finalized.

Watch also for the terms of reference of our new research scholarships for students.

## THE MOST COMPREHENSIVE PHOTO CD!

### Photographic Guide to Mineral Species

An astounding 5400 never-before-published photographs depicting 3100 different mineral species are pictured in this remarkable CD, four times the number of different minerals seen in any other product! Completely hyperlinked among species names, localities and associations, this outstanding photographic record captures many of the rarely-seen, frequently-overlooked phases in the mineral kingdom. An invaluable teaching aid and reference work, this multi-featured, dual platform CD includes Netscape Communicator 4.5 and will operate in both Windows and Mac operating systems! Only **\$69.95 plus \$5.00 shipping.**

## THE FINEST NEW BOOKS!

**LOVOZERO - by Dr. Igor Pekov** - A comprehensive study of the history, geology and mineralogy of this prolific area of the Kola Peninsula, with nearly 500 pages and fully illustrated with hundreds of color and b/w photos, maps and drawings, plus comprehensive chemical and descriptive data on the 340+ mineral species that occur there! Hardcover volume, superbly done, just **\$79.00 plus shipping.** Exclusively from us!

### LANGBAN - The Mines, Minerals, Geology & Explorers

Ed. by Holtstam and Langhof - A superb 215+ page hardcover book printed on exquisite heavy stock that tells the complete story of this prolific Swedish mineral locality. Filled with excellent color photos as well as black and white images of the rich mineralogy and history of this famous area, this book is a long-awaited masterpiece of regional mineralogy that every library should have! Full descriptive mineralogy of the hundreds of species that occur there, coupled with a marvelous historical treatment make this an instant classic! Large format (30x22cm), superb printing quality @ **\$75.00 plus shipping**

## THE BEST DATABASE! - NOW on CD!

### The Fersman Museum Mineral Database

This excellent software product is a comprehensive database of all approved mineral species through early 2000. Information for each mineral includes chemistry, mineral group, X-ray data and space group, optical data, other physical properties as well as type locality and literature references! **Most importantly, every field or combination of fields is fully searchable!** This DOS-based program works well in any Windows environment with an IBM-compatible system. We have prepared a full installation package and instruction guide for our clients, and this excellent software package is just **\$99.00 plus \$5.00 shipping.**

Use your Visa, MasterCard, or American Express card. Institutional purchase orders accepted via fax. Order these fine products exclusively from:

### **Excalibur Mineral Company**

1000 North Division Street - Peekskill, NY 10566

Tel: (914) 739-1134 - Fax: (914) 739-1257

E-Mail: [order@excaliburmineral.com](mailto:order@excaliburmineral.com)

Website: [www.excaliburmineral.com](http://www.excaliburmineral.com)

## PEOPLE BEHIND MINERAL NAMES:

### DAVID LONDON

Londonite is a rare constituent of highly evolved peraluminous granitic systems. The species has the formula  $(\text{Cs}, \text{K}, \text{Rb})\text{Al}_4\text{Be}_4(\text{B}, \text{Be})_{12}\text{O}_{28}$  and is the cesium-dominant analogue of rhodizite,  $(\text{K}, \text{Cs})\text{Al}_4\text{Be}_4(\text{B}, \text{Be})_{12}\text{O}_{28}$ , discovered in 1834 in an evolved pegmatite in the Middle Urals. Routine electron-microprobe traverses of rhodizite crystals from the Antandrokomby granitic pegmatite (Madagascar) by Simmons *et al.* led to the discovery of the Cs-dominant domains in the striking dodecahedra. Skip Simmons and colleagues proposed the name *londonite* to the IMA-CNMMN. Just who is David London, and why was he honored in this way?

"I was born on February 27, 1953, in Ardmore, Oklahoma. Though I enjoyed the traditional outdoor Oklahoma upbringing, on horseback, hunting and fishing, I did not become interested in geology until I was a college sophomore at Wesleyan University, Connecticut. I have loved experimental chemistry from the time I was six, but the chemistry major at Wesleyan would have led to a laboratory or clinical career that did not seem appealing at the time. A friend suggested that I look into geology, which I did on a certain Friday in March, 1972. I visited Jim Gutmann, professor of mineralogy and petrology at Wesleyan. Jim was then, as always, enthusiastic and encouraging of any student's interest in geology, and he invited me to accompany his class on a field trip the next morning to granitic pegmatites in the Middletown and Portland areas of Connecticut. I tore at the Strickland pegmatite dumps with the enthusiasm of someone who is used to poking around outdoors, and found specimens that were both beautiful and interesting. Jim Gutmann has one of the most expressive faces



David London

I've ever seen, and when I showed him my rocks, his looks of incredulous approval made a big impression on me: "Where did you find that? No one's found lithiophilite here in years!" "That's morganite, gem-quality pink beryl!" and so forth. I was instantly hooked and changed my major from chemistry to geology, beginning with mineralogy in the fall semester.

"My undergraduate degree at Wesleyan entailed considerable field training by any standards, and I augmented this with weekly collecting trips. I learned that I was good at finding and collecting mineral specimens, and much of my collecting was in the dumps of Connecticut pegmatites. Although I studied the chemistry of marsh soils for my senior research, pegmatites were of growing intellectual interest to me, especially because Gutmann, a former Ph.D. student of Dick Jahns, imbued our field trips with the Jahns-Burnham model. Upon graduation from Wesleyan in 1975, I met and married my wife, Elizabeth Brandt Haley, and we worked for the U.S. Geological Survey, Geological Division out of Boston, and then out of Middletown, doing a mixture of field mapping and compilation of rocks (me) and glacial deposits (her) in

the region. I owe a debt to Maurice "Mike" Pease, then director of the Boston office of the USGS, for teaching me his impeccable field mapping methods. When we decided to return to school for our graduate degrees, I knew I wanted to pursue some novel form of chemistry as applied to mineralogically interesting rocks, like pegmatites. I quickly narrowed my graduate search down to two individuals, both graduates of the J.B. Thompson "school" of geochemistry at Harvard. In the end, the choice was obvious, and I went to Arizona State University in 1976 to study with Don Burt. Don introduced me to skarns and to his own applications of theoretical chemistry, which he was just bringing to bear on pegmatites. I know I won some credibility with Don right from the start on a field trip to the Iron Cap skarns in southeastern Arizona. I found some black, bladed, striated crystals in altered skarn and showed them to Don. He puzzled over them a bit, discounted ilvaite (which I'd never heard of), and then I blurted out "maybe it's babingtonite". He gave me a look of amazement that I still remember today. I had no idea that babingtonite had been a player in Don's Ph.D. research, and that he had predicted its occurrence in skarns. It was, in fact, babingtonite, which I had first seen and identified while collecting prehnite and zeolites from basalt trap rock quarries in Connecticut.

"While a student at ASU, I continued to develop my field knowledge of rocks and minerals by working weekends for professional specimen collectors in Arizona's base-metal mines, and I spent summers employed in geological field mapping in Connecticut. I also gained considerable appreciation for Don's approach to geochemistry. The interests of most chemical petro-

logists focus on the uniform rock matter that lies inside the box. Don was interested in what bounded and shaped the box, at the edges of chemical and petrological systems. Evolved granitic pegmatites, especially where they intrude amphibolites (as in the White Picacho district, Arizona, where I conducted research for my M.S. degree), proved to be as good an example of the limits of natural chemistry as one could hope for. Don also liked systems that evolved sharply from initial states far from chemical equilibrium (*e.g.*, skarns). Though I didn't understand it at the time, pegmatites, whose textures are remarkably similar to those of skarns, follow from the same process. David B. Stewart (USGS), Dan Appleman (NMNH), and Hatten S. Yoder, Jr.\* (Geophysical Lab) all gave me the lab space I needed in 1980 to complete my Ph.D. while my wife worked for the USGS in Reston.

"Upon my graduation from ASU in 1981, Hat Yoder offered me a postdoctoral research fellowship at the Geophysical Laboratory that really launched my career in experimental petrology. Hat gave me unbridled freedom to pursue my interests in pegmatite mineralogy, and to complete work on the lithium aluminosilicate phase diagram. I also had full leeway to work at the USGS, where Ed Roedder had offered his lab and advice for my initial foray into fluid inclusion analysis. I started with inclusions in the Tanco pegmatite, Manitoba, which in hindsight was as complex a magmatic-fluid system as I have ever seen or heard report of. My study of Tanco led to a fruitful professional collaboration with Petr Černý, produced a new mineral species (diomignite), and began what has now become two decades of research into the geochemistry of rare alkalis (especially cesium), beryllium, boron, phosphorus, and fluorine in



## PEOPLE BEHIND MINERAL NAMES:

granitic systems. The honorary naming of londonite,  $\text{CsAl}_4\text{Be}_5\text{B}_{11}\text{O}_{24}$ , was not just a personal thrill for me, but a perfect fit with my geochemical specialization.

"I returned to Oklahoma in 1983. The move began my teaching career in the School of Geology & Geophysics at the University of Oklahoma, and it gave me an important opportunity to help my parents through the remainder of their lives. Oklahoma may not seem like a logical place to launch a career in pegmatite studies, but the University and the various directors of the School have provided exceptional support for my research. The fact that my work is largely experimental, and my field interests global, makes Oklahoma as viable a place as any. The small but steady flow of students and postdocs through my laboratories has provided much of the fuel on which my pegmatite engine has run. I've had a particularly rewarding collaboration with George B. Morgan VI, my first graduate recruit, since 1984. In the past few years, our group has focused on crystal dissolution, crystal growth, diffusion of elements through silicate melt, and partitioning of trace elements between crystals and melt. We have calibrated buffering mineral-melt reactions for a variety of lithophile elements, and have now completed fairly large portions of their geochemical cycles from anatexis to the solidification of granitic pegmatite. We are now combining experiments and natural rock slices, in fact complete sections of pegmatite dikes, to elucidate the fractionation process that promotes sharp chemical zonation within pegmatites. I have invigorated the Pegmatite Interest Group (PIG) on the website of the Mineralogical Society of America, and I hope that it fosters new interest among students of these rocks."

David has been somewhat modest in his narrative. I was a

student of Dick Jahns and C. Wayne Burnham, and was brought up "living and breathing" the Jahns-Burnham model. To say that it was ingrained is putting things mildly. These days, when I teach about granitic pegmatites, I encourage debate about *two* competing models. What now has become known as the London model challenges the basic tenet of the Jahns-Burnham school, that bodies of granitic pegmatite form from batches of felsic magma that have achieved early saturation in an aqueous fluid. By careful modeling based on experimental findings and checked against field occurrences, David has proposed that felsic magmas develop the pegmatitic texture *prior to saturation* in a fluid phase. Talk about upsetting the apple cart! Readers interested in reading about the evidence and the new model should consult David's 1992 paper in *Can. Mineral.* and his 1996 review paper in the *Transactions of the Royal Society of Edinburgh*.

In their justification of the name *londonite*, Simmons *et al.* wrote: "in recognition of his experimental studies of evolved granitic melts and his contributions to our understanding of the origin and patterns of crystallization of granitic pegmatites." David has had a great impact on the development of the field, and will undoubtedly continue with well-illustrated and meaningful contributions to this exciting area of igneous petrology.

Robert F. Martin

### References

LONDON, D. (1992): The application of experimental petrology to the genesis and crystallization of granitic pegmatites. *Can. Mineral.* **30**, 499-540.

LONDON, D. (1996): Granitic pegmatites. *Roy. Soc. Edinburgh, Trans.* **87**, 305-319.

SIMMONS, W.B., PEZZOTTA, F., FALSTER, A.U. & WEBBER, K.L. (2001): Londonite, a new mineral species: the Cs-dominant analogue of rhodizite from the Antandrokomby granitic pegmatite, Madagascar. *Can. Mineral.* **39**, 747-755.

\* Deceased August 2003.

## OBITUARY

### MARCELLE JUANITA HORN WEBER, 1918-2003

Marcelle Weber, a long-time MAC member, died of cancer of the lung and kidney on July 8, 2003. Marcelle was an amateur mineralogist, whose influence in mineralogy was significant and will be felt far into the future.

Born on September 19, 1918, to George Bertrand and Vera Ethel Pratt Horn, in Randolph County, Indiana, Marcelle attended high school in Fairfield, Connecticut. She later returned to Indiana, where she earned an A.B. in business administration from Indiana University (1940), and won her wings as a pilot. She returned to Fairfield, however, to work for Remington Arms, and in 1942 married Charles Henry Weber Jr. Together, she and Charlie forged careers and lives as rewarding as anyone could desire.

Proud of her heritage, Marcelle was actively involved in national, state, and local chapters of several lineage societies, including Daughters of the American Revolution, Women Descendants of the Ancient and Honorable Artillery Company, Daughters of Colonial Wars in Connecticut, U.S. Daughters of 1812, Colonial Dames of America, National Society of New England Women, The Flagon and Trencher, Society of Descendants of the Colonial Clergy, and the Huguenot Society of Connecticut.

Her almost lifelong passion for mineralogy led to Marcelle's recognition as one of the most knowledgeable and respected amateur mineralogists in the U.S. and Canada. Marcelle was an avid photomicrographer, lecturer, and author, taking her message to micromount symposia and conferences throughout North America. As a result of her work, she was inducted into



Marcelle behind her microscope at the 2000 Tucson Gem and Mineral Show.

the Micromounters Hall of Fame in 1992. It is significant with respect to her reputation in mineralogy that she was nominated for election to the Hall of Fame by Paul Desautels, former Curator at the Smithsonian Institution. She was an active member of Friends of Mineralogy, Micromounters of New England, the Tucson Gem and Mineral Society, the Mineralogical Association of Canada, the Baltimore Mineral Society, the Canadian MicroMineral Association, and the New Haven and Stanford Mineral Clubs.

Marcelle had a wide interest in minerals and mineral locations generally, but in the 1960s she and Charlie turned to the developing quarries at Mont Saint-Hilaire, Québec. Whenever a collecting date at Mont Saint-Hilaire was available, they would drive, rain or shine, from Connecticut to the quarries. There, Charlie would do the heavy rock-breaking work while Marcelle searched for specimens. They were usually very successful. Word soon got around among the other collectors that the best way to find minerals at Mont Saint-Hilaire was to follow Marcelle. She had an eagle eye for spotting the rare and unusual, and it did not take long for her reputation to spread through the amateur and professional communities.

## OBITUARY

In the early 1990s, on one of their Mont Saint-Hilaire trips, Charlie and Marcelle found a new mineral that was ultimately named *charmarite* in their honour. The Smithsonian Institution and the Canadian Museum of Nature, among others, hold specimens from their extensive collection.

Although knowledge and capability were keys to her achievements, the success itself came through the exercise of leadership. She was a long-term contributor to the funding of the *Mineralogical Record* and the Rochester Mineralogical Symposium, wrote a column in the *Mineralogical Record* on behalf of the Friends of Mineralogy, traded in micromounts worldwide, maintained an extensive library on micromounting, and in general was always in front of the pack.

Marcelle leaves Charlie, her husband of 60 years, two daughters, a son, seven grandchildren, and one great grandchild, in addition to many nieces, nephews, colleagues, and friends. She will be greatly missed.

A memorial service will be held in the fall. In the meantime, Charlie has asked that donations be made to a mineral acquisition fund in her name at the Canadian Museum of Nature. Donations should be sent to Canadian Museum of Nature, P.O. Box 3443, Station D, Ottawa, ON K1P 6P4, Canada. ATTN: Mr. Robert Gault – confidential.

Quintin Wight

**BOYLE, ROBERT. W.,**  
Ph.D, F.R.S.C., F.R.G.S.  
Royal Canadian Artillery (1939-1945)  
Geological Survey of Canada  
(1952-1985)

Decorated WW II veteran, respected research scientist, and a beloved and loving family man, Bob Boyle left this world

peacefully on August 5, 2003. Mourning his departure are his adored wife of 57 years, Marguerite; daughter Heather Robinson (Winnipeg); daughter-in-law Christy Vodden; and grandson Matthew Boyle. He was predeceased by his son Dan Boyle and sister Barbara Delmotte. He will be greatly missed by his many relatives, friends, and colleagues around the world.

Bob was born in 1920 in southwestern Ontario on a farm neighbouring that of his wife's family. A love of the outdoors and a questing curiosity about the world shaped his future as one of Canada's most respected geologists. Bob served overseas with great distinction during WW II with the Royal Canadian Artillery, after which he started his studies at the University of Toronto, obtaining his Ph.D in 1953. He joined the Geological Survey of Canada in 1952, where he became a world expert in gold and silver deposits, and developed geochemical prospecting methods specifically suited to the Canadian environment and, through experience gained in the field, made them truly practical tools in mineral exploration. He was a prolific author, who published major works on precious metals, notably "Gold: History and Genesis of Deposits" in 1987. Bob was active in many professional associations at both the national and the international levels, and lectured at Carleton and numerous other universities. He received many honours and awards throughout his career, starting with his election as a Fellow of the Royal Society of Canada in 1957 through to his induction into the Canadian Mining Hall of Fame in 1997.

He was a long-time member of MAC and he received the Past-Presidents' Medal in 1992. He also had the distinction of having a mineral named in his honor, *boyleite*.

## MEMBER IN THE NEWS

### Fred Longstaffe receives Logan Medal

Dr. Frederick J. Longstaffe was awarded the GAC Logan Medal, the highest award bestowed by the Geological Association of Canada. It is awarded to an individual who has made outstanding contributions to geoscientific knowledge in Canada.

In the quarter-century since he graduated with a McMaster doctorate, Frederick John Longstaffe has built for himself a distinguished academic career in the universities of Alberta and Western Ontario. In research, Fred Longstaffe has propelled himself to international preeminence as a geochemist by pioneering the use of stable isotopes to improve fundamental understanding of processes operating on and within the Earth. He has addressed such diverse issues as the evolution of ancient crustal rocks, clay-mineral genesis, fluid movement in sedimentary basins, formation and exploitation of heavy oils and oil sands, natural generation of greenhouse gases, plant biomineralization, and paleoclimatic reconstruction. A teacher of high repute, his pedagogical skills have been manifest not only in the university classroom, but also, nationally and internationally, on the lecture circuit and in short courses offered with almost biannual regularity. A university department head and dean, Fred Longstaffe has also served his professional community loyally and well, as a former President of the Geological Association of Canada, Director of the Earth, Ocean, and Atmospheric Division of the Royal Society of Canada, Chairman of NATO's Advisory Panel on Advanced Study Institutes, and chairman or member of more than fifty other organizational bodies in the geosciences outside his university.

In their totality, Fred Longstaffe's accomplishments amount to an academic *tour de force* richly deserving of recognition at the highest level.

### Sandra Barr incoming GAC President



Sandra Barr, new GAC  
Vice-President

Long-time MAC member Sandra M. Barr was elected Vice-President of the Geological Association of Canada at the annual meeting in May in Vancouver. Sandra is a professor in the Department of Geology, Acadia University, Wolfville, Nova Scotia, where she has taught since 1976. Originally from St. Stephen, New Brunswick, she completed her B.Sc. with honours in geology at the University of New Brunswick in 1968, and her Ph.D. in geology at the University of British Columbia in 1973. After two years of post-doctoral work at Dalhousie University and Bedford Institute of Oceanography, Sandra taught at Chiang Mai University in northern Thailand for two years as a CUSO volunteer. She returned to Canada in 1976 to assume a faculty position in the Department of Geology at Acadia University. She currently teaches courses in introductory geology, igneous petrology, global tectonics, geological mapping, and Appalachian geology, and has supervised over 60 undergraduate and graduate thesis projects.

Continued on page 20



## PEGMATITE WORKSHOP HELD IN POLAND, MAINE IN MAY/JUNE 2003

BY AL FALSTER

The Second Pegmatite Workshop was held at the Poland Mining Camp in Poland, Maine for one week from the end of May to early June, 2003. The group attending the workshop totaled 24. The workshop was convened by Dr. Wm. B. Simmons from the Department of Geology and Geophysics, University of New Orleans, and Raymond Sprague of Andover, Maine. Courses were taught by Wm. B. Simmons, Karen Webber, Alexander Falster, and James Nizamoff with guest lectures by Raymond Sprague, Frank Perham, and Gary Freeman. The workshop differed from other specialized pegmatite meetings (for example, the memorable 1982 *Workshop on Granitic Pegmatites in Science and Industry* held in Winnipeg, Manitoba, or the *First International Workshop on Petrology, Rare Minerals, and Gemstones of Shallow-Depth Pegmatites* in Milano, Italy, 1997) by following a step-by-step sequence of lectures designed to provide background information for all participants and by including basics such as fundamental tectonics and crystallography. The goal of our workshop was to supply interested amateurs, miners, or students with a broad



**Figure 1. Collage of images taken during the Second Pegmatite Workshop.**

overview of all topics related to pegmatites.

Below is an outline of topics covered at the 2003 workshop.

- Introduction to the nature of pegmatites
- Introductory concepts of igneous rock formation and mineral composition
- Overview of pegmatite mineralogy
- Pegmatites in relation to other igneous rocks
- The roles of volatiles and fluxes in the crystallization of pegmatitic melts
- The structural and textural variations within pegmatites
- The origin and classification of pegmatites
- How to assess the gem and mineralogical potential of pegmatites
- Mineral associations in Maine pegmatites

• "Pockets" in pegmatites, their formation and mineralogy

Lectures were held each morning and were followed by field trips to pegmatites in Oxford Co., Maine. Pegmatites visited this year included the Hole-in-the-Ground, Harvard, Hayes, Mt. Marie, Bennett, Orchard, and Emmons pegmatites. Information pointing out important features of each pegmatite was given out before the field trip as well as on site. Sample collection by participants was possible and made the visits to the pegmatites even more interesting. Figure 1 is a collage of photographs of various activities during the workshop.

Evenings were made lively by many discussions of pegmatite-related topics. Other events included an ugly shirt contest with prizes, an art show by artist Fred Wilda, a book show by Gary Baril, and numerous opportunities to examine special specimens brought in by local miners and participants. Binocular microscopes were set up, allowing participants to examine the day's finds as well as oddities brought by participants for 'show and tell'. Meals were provided (including a Cajun crawfish etouffe dinner and a lobster feed on two nights). A 'rainy day' was included in the program and allowed participants to visit the beautiful mineral display at the Poland Springs Museum and local mineral dealers. It was a fun and informational week and many participants are already making plans to attend the third workshop next year, which will be held from May 29 to June 6. For information on the third workshop, check <http://homepage.mac.com/rasprague/PegShop>

### MEMBERS IN THE NEWS (Continued from page 19)

Sandra's research is focused on the geological evolution of the northern Appalachian mountain belt of Nova Scotia and New Brunswick, with strong emphasis on field mapping. She also has projects in Labrador and Thailand. In 1995, she was awarded the Gesner Medal of the Atlantic Geoscience Society in recognition of her contributions to the geosciences in Atlantic Canada.

Sandra has been a member of MAC since 1980, and served as Secretary from 1984-88. She also served MAC as Vice-Chairman for the

Wolfville '92 annual meeting. Sandra has served on numerous earth science committees over the years, including the NATMAP Coordination Committee (1998-2002) and the NSERC Grant Selection Committee for Solid Earth Sciences (1994-1997). She was a member of the Canadian delegation to International Geological Congresses in Beijing (1996) and Kyoto (1992). She has been co-editor of the Atlantic Geoscience Society journal *Atlantic Geology* since 1986, and is a member of the Local Organizing Committee for the Halifax 2005 GAC-MAC-CSPG meeting, in the role of chair of the Field Trip Committee.



## CONFERENCE REPORTS

### Sustainable Development in the Mineral Resources Sector: An Oxymoron or Golden Opportunity?

BY JEREMY RICHARDS  
JEREMY.RICHARDS@UALBERTA.CA

On May 28, 2003, at the GAC-MAC Annual Meeting in Vancouver, the MAC co-sponsored (along with GAC and the Society of Economic Geologists) a symposium on sustainable development in the minerals industry. The symposium followed on from a workshop with a similar theme held in conjunction with the CIM Annual Meeting in Vancouver, May 2002, and was organized under the aegis of the Canadian Geoscience Council Standing Committee on Sustainable Mineral Resources Development.

The symposium featured seven presentations, and was attended by 40 to 50 people. Needless to say, the prejudice of the organizer was confirmed, and sustainable development was found indeed to be a golden opportunity for the minerals industry.

The symposium began with an excellent keynote presentation by Professor F.-W. (Fred) Wellmer, from the Federal Institute for Geosciences and Natural Resources (BGR), Hannover, Germany. Dr. Wellmer discussed sustainable development in the context of finding functionally equivalent alternatives for materials usage, and stressed the need for research and technological development to achieve these goals. Dr. Wellmer's talk generated much discussion, which, due to the non-appearance of the second speaker, he kindly agreed to extend for a further 15 minutes, thus well earning the contribution towards his travel costs offered by the sponsors!

Dr. Wellmer's marathon session was followed by a series of talks with regional foci, ranging from California, to Vietnam, British Columbia, and Nunavut. Dan Leavell (Ohio State University, Newark) discussed the novel use of waste graphitic slate produced from old gold mining operations in the Mother Lode district as a filler in asphalt seal coatings for protection from UV degradation. He also discussed the transformation of this classic old mining district into an up-market residential and wine-growing region.

Jeremy Richards (University of Alberta) presented a case study of the Nui Phao poly-

metallic skarn deposit in northern Vietnam, which is being developed by a Canadian junior mining company, Tiberon Minerals Ltd. The development plan contains numerous examples of practical applications of sustainable development principles, and the Vietnamese government sector seems well suited to ensure that this project meets all the criteria for sustainable social, economic, and environmental development.

Rolf Schmitt (BC Ministry of Sustainable Resource Management) brought the focus of the final set of talks back to Canada by presenting a case for a sustainable development strategy for mining in British Columbia. He noted that mining had provided an important historical foundation for the province, but that change was needed to bring the industry into line with modern thinking on sustainable development. The Ministry is providing leadership in this direction, in partnership with industry, First Nations, and other social groups.

Norman Duke (University of Western Ontario) and Wayne Johnson (Nunavut Tunngavik Incorporated, NTI) put on an impressive double act to illustrate their program of grass-roots collaborative exploration in Nunavut, involving partnering with industry, academia, and NTI. An important aspect of this program was the direct employment of young Nunavummiut in the exploration programs, with the objective of encouraging them to pursue education and careers in geosciences.

David Scott (GSC) continued the theme of northern Canada with a presentation on the role of geoscience in sustainable development in Nunavut. He noted that Nunavut has the fastest growing population in Canada, but also its lowest education, income, and life expectancy levels, and highest level of unemployment. These statistics make an urgent case for sustainable development, and the minerals industry offers the only viable solution. Nunavut is well endowed with mineral resources, but to date has been underexplored and the level of basic geological information is very low. Scott argued that improving the framework of geological knowledge is an essential first step in promoting mineral development, which in turn will underpin broader sustainable development goals in the community.

Gordon Mackay, from the Nunavut Department of Sustainable Development, brought the symposium to a close with a presentation on the Nunavut government's view of sustainable development. He described the government's objectives to improve the quality of life for Nunavummiut through improvements in environment, health, economy, and self-determination, and assurance of sustainability of these goals into the future. He described ways in which mining development projects would be tested against these goals, in order to ensure that the community benefits appropriately from development in the region.

In conclusion, the symposium brought together a wide range of scientists with a shared view of the importance of sustainable development principles, combined with an optimistic view of how the mining industry can help achieve these objectives (rather than being their nemesis). It is hoped, by keeping these issues in the spotlight through symposia such as this, that this message will be heard more widely, both in industry and government circles, as well as in the community. The organizer thanks the MAC, GAC, and SEG for their support of this symposium, and all the presenters and their co-authors for their excellent contributions.

### Metals in the Environment

BY DOGAN PAKTUNC (DPAKTUNC@NRCAN.GC.CA)  
AND JOHN JAMBOR

The MAC-sponsored symposium on *Metals in the Environment* was held during the GAC-MAC-SEG Annual Meeting, May 25-28, 2003 in Vancouver. The symposium, chaired by Dogan Paktunc, featured fifteen oral presentations. Both the symposium and the companion all-day special session on *Environmental Studies of Mine Wastes*, chaired by Leslie Smith on the preceding day, were attended by more than 60 registrants. The symposium presentations covered a wide spectrum of topics including adsorption of radionuclides to goethite and clay minerals for nuclear waste repositories, bacteria-metal interactions, metalliferous aerosol particles, and CO<sub>2</sub> sequestration by geological materials.

## CONFERENCE REPORTS

The one-day symposium featured the following subjects: Gd adsorption onto goethite and nontronite (by Scott Wood); Adsorption of Cs on clay minerals (by Reg Ejeckam); Metalliferous airborne particulate matter in urban and industrial sites (by Teresa Moreno); Metal enrichments in atmospheric deposition (by Kevin Telmer); Estimation of trace element distribution in biota (by Elena Hozhina); Reactivity of bacteria-water interface (by David Fowle); Biofouling of metal surfaces (by Bhavleen Kaur); A novel chemical speciation technique (by Eric Hoffman); Linkages between metals bioavailability and chemical extraction techniques (by Shuangquan Zhang); Respirable particulates in a Hg mine (by Wes Gibbons); Hg- and Sb-contaminated soils (by Alain Plouffe); Hg contamination from small-scale placer gold mining (by Kevin Telmer); Remote sensing techniques to track acid rock drainage mineralogy (by Phoebe Hauff); Use of asbestos residues for CO<sub>2</sub> sequestration (by François Huot); Evaluation of serpentinite for CO<sub>2</sub> sequestration (by Dawn Kellett).

The special session consisted of the following oral presentations: Kimberlite tailings from Ekati Diamond Mine (by Andrew Rollo); Water flow within a waste rock pile (by Joseph Marcoline); Infiltration through the cover of a waste rock pile (by Ian Ritchie); Aluminosilicate transformation in heap-leach piles (by Barbara Sherriff); Remote-sensing of mine wastes (by Phoebe Hauff); Geochemical characterization of the Britannia mine wastes (by Heidi Pass); Secondary Cu-sulfides in a metal-mining polishing pond (by Alan Martin); Heavy metal contamination of reef sediments from submarine tailings disposal in Indonesia (by Evan Edinger); Effect of vegetation on mine tailings (by Lena Alakangas); Geochemical stability of secondary Fe sulfates in mine wastes (by Nikolay Sidenko); Dehydration of minerals in mine wastes (by Ronald Peterson); Speciation and characterization of arsenic in gold ores and tailings by XAFS (by Dogan Paktunc); Synchrotron-based micro-XRD and micro-XANES on As-bearing mine

wastes (by Heather Jamieson); Reactive transport modeling study of the Fault Lake tailings area (by Connie Romano); Mineral assemblages forming in slags (by Nikolay Sidenko); XAFS investigation of an hydrated Fe-Al arsenate solid solution (by Tom Kotzer); XAFS characterization of As-bearing minerals in uranium tailings (by Tom Kotzer); Assessment and prediction of metal leaching and ARD in Gallowai Bul River mineral prospect (by Michele Lepitre).

The papers presented during the symposium, along with a selected number from the special session on Environmental Studies of Mine Wastes, will be published in a special issue of *The Canadian Mineralogist* following regular peer review.

### Fluid and melt inclusions to understanding geologic processes

BY IAIN SAMSON

To complement its short course on fluid inclusions, MAC sponsored a special session at Vancouver 2003 entitled "The application of fluid and melt inclusions to understanding geologic processes", organized by Iain Samson and Alan Anderson. This session comprised 12 talks and 1 poster. The presentations covered a broad range of applications of fluid and melt inclusions, including the application of melt and fluid inclusions to understanding a variety of mineral deposit types: porphyry Cu-Mo deposits, VMS deposits, rare-metal pegmatites, calcite and barite vein deposits, and vein gold deposits. Other contributions examined metal partitioning in vapor-brine systems, phase equilibrium thermodynamics, X-ray computed tomography analysis of inclusions, melt inclusions in peridotites, fluid inclusions in granulites, and paleoclimate data from fluid inclusions in halite. Two of these presentations were given by keynote speakers: Bob Bodnar from Virginia Tech and Larry Diamond from the University of Bern.

## MEETING CALENDAR

### Nov. 2 - 5, 2003

**GSA Annual Meeting**, Seattle WA USA. Further information can be obtained at [meetings@geosociety.org](mailto:meetings@geosociety.org) or [www.geosociety.org/meetings/index.htm](http://www.geosociety.org/meetings/index.htm)

### January 5-7, 2004

**Geothermal Processes**, a joint annual meeting of the Applied Mineralogy, Geochemistry, Metamorphic Studies and the Volcanic & Magmatic Studies Groups of the Mineralogical Society, Bath, England. Abstract deadline: October 31, 2003. For more information, [www.minersoc.org](http://www.minersoc.org) or e-mail [info@minersoc.org](mailto:info@minersoc.org)

### May 12-14, 2004

**Joint annual meeting of the Geological Association of Canada and the Mineralogical Association of Canada**, Brock University, St. Catharines, Ontario. For additional information, visit [www.stcatharines2004.com](http://www.stcatharines2004.com)

### May 17-21, 2004

**Joint Meeting of AGU and the Canadian Geophysical Union (CGU)**, Montreal, Quebec, Canada. For information, [meetinginfo@agu.org](mailto:meetinginfo@agu.org) or [www.agu.org/meetings](http://www.agu.org/meetings)

### June 6-12, 2004

**14th V.M. Goldschmidt Conference**, Copenhagen, Denmark. More information can be obtained at [goldschmidt@geol.ku.dk](mailto:goldschmidt@geol.ku.dk) or [www.goldschmidt2004.dk/](http://www.goldschmidt2004.dk/)

### June 26-28 2004

**5th International Conference on MINERALOGY & MUSEUMS**, Paris, France. Details: Conference Secretariat, SFMC, Tour 16, Casier 83, 4, place Jussieu, 75252 Paris Cedex 05 France [www.ensmp.fr/Fr/Actualites/Agenda/PDF/MM5.html](http://www.ensmp.fr/Fr/Actualites/Agenda/PDF/MM5.html)

### August 20-28, 2004

**Italia 2004 – From the Mediterranean Area Toward a Global Geological Renaissance**, Florence, Italy. 32nd International Geological Congress. For more information, [www.32igc.org](http://www.32igc.org) or [secretariat@32igc.org](mailto:secretariat@32igc.org)

### September 19-22, 2004

**8th International Congress on Applied Mineralogy (ICAM 2004)** Aguas de Lindoia, Sao Paulo, Brazil. Abstract deadline: October 1, 2003. For more information, [dpaktunc@NRCan.gc.ca](mailto:dpaktunc@NRCan.gc.ca) or visit [www.icam2004.org](http://www.icam2004.org)

For an exhaustive listing of meetings of mineralogical interest, consult Dr. Andrea Koziol's web page at <http://homepages.udayton.edu/~koziol/meetings.html>

## OUTSIDE NEWS

### NEWS FROM IMA

BY MARYSE OHNENSTETTER  
MOHNEN@CRPG.CNRS-NANCY.FR

#### The Council meeting in Nice

The IMA Council met in Nice on April 5, 2003, before the first EGS-AGU-EUG Joint Assembly (April 6-11). The Council meeting was held in the University of Nice whose buildings are within the Parc Valrose, close to the old town. Arrangements for the meeting room were made by Professor Raoul Caruba from the University of Nice. For nearly five hours, councilors reviewed the various activities of IMA, notably those related to the IMA commissions and working groups, since the last General Meeting held in Edinburgh in September 2002. The minutes of the three Council meetings held in Edinburgh were approved. In the future, the IMA will become more involved in international meetings favoring communication between mineralogists and geochemists.

#### Next Business meeting in Florence, 2004

The Council considers that the involvement of IMA in the 32nd IGC meeting in Florence is good for the unity of Earth sciences. Nearly all the IMA commissions and working groups will help organize symposia and/or sessions. IMA is organizing a symposium on mineralogy (G15) comprising twelve sessions. It is also sponsoring a session on the Earth's interior and four sessions on mineral deposits. Besides this, IMA is co-sponsoring thirteen sessions distributed among nine symposia. Detailed information can be obtained at [www.32igc.org](http://www.32igc.org).

An ordinary business meeting will be held during the 32nd IGC in Florence. The chairmen and secretaries of new working groups proposed since the Edinburgh General Meeting will be elected by delegates during the Second Business Meeting. The procedure for the election of officers of working groups is described in the Constitution, article 13b. Candidate nominations should be submitted before April 2004. The achievements and performance of IMA commissions and working groups will be reviewed in accordance with the recommendations made during the Edinburgh General Meeting. Annual reports from commissions and working groups are to be sent to the Secretary of IMA before the end of November 2003. During the business meeting in Florence, the venue of the 20th IMA General Meeting will be decided. Two locations have been proposed, Budapest and Paris.

Other meetings in which IMA is involved are mentioned on the IMA website. The International Council for Applied Mineralogy (ICAM) is organizing jointly with the IMA Commission on

Applied Mineralogy (IMA-CAM) the 8th International Congress on Applied Mineralogy, ICAM 2004 (September 19-22). ICAM 2004 will be held in Aguas de Lindoia, 170 km from Sao Paulo, Brazil.

#### Competition for the IMA logo

The logos of mineralogical societies affiliated with IMA are illustrated on the home page of the IMA website. When no mineralogical society exists, the logo from the geological society hosting the mineralogy group is shown. These logos may help you when designing a logo for IMA. Remember that the competition to create a logo for IMA is open to all members of any mineralogical society or group that subscribes to IMA. Full information on the competition is available at the new IMA website: [www.obs.univ-bpclermont.fr/ima](http://www.obs.univ-bpclermont.fr/ima).

#### CREATE A LOGO FOR IMA AND WIN US\$200 PLUS FREE REGISTRATION AND ACCOMMODATION AT IMA 2006 IN KOBE, JAPAN

The International Mineralogical Association is the only truly international organization promoting mineralogy. It is supported by subscriptions from 38 mineralogical societies and groups worldwide.

The Council of IMA invites any member of one of the subscribing organizations to design a logo to be used in the Association's official and promotional material. The winning design will be selected by the IMA Council, at the IUGS meeting in Florence in August 2004.

Designs, in both coloured and black-and-white versions, should be submitted electronically to the Secretary of IMA, Dr Maryse Ohnenstetter at [mohnen@crpg.cnrs-nancy.fr](mailto:mohnen@crpg.cnrs-nancy.fr) no later than March 31, 2004.

For information about IMA, rules of the competition, and technical details to which the designs must conform, visit the IMA website at [www.obs.univ-bpclermont.fr/ima](http://www.obs.univ-bpclermont.fr/ima).

Information can also be obtained from your IMA national representative or from the secretary of your national mineralogical organization.

#### ICDD NEWS

To encourage promising graduate students to pursue crystallography-oriented research, the International Centre for Diffraction Data (ICDD) has established the Ludo Frevel Crystallography Scholarship Fund. Multiple recipients are selected on a competitive basis, each

receiving an award of \$2,250. Applications must be received by October 31, 2003.

Qualifications of the applicant: The applicant should be enrolled in a graduate degree program during the 2004 calendar year with major interest in crystallography, e.g. crystal structure analysis, crystal morphology, modulated structures, correlation of atomic structure with physical properties, systematic classification of crystal structures, phase identification, and materials characterization. There are no restrictions on country, race, age or sex. The term of the scholarship is one year.

To apply, submit:

- Curriculum vitae, listing degree(s) held and degree(s) sought.
- A one-page summary by the graduate student describing the type of crystallographic research being pursued in satisfying the requirements of an advanced degree, and the applicant's expected date of graduation.
- A support letter from the sponsoring professor at an accredited university or an institute of technology, on institution letterhead.

to Scholarship Committee, c/o Corporate Secretary, International Centre for Diffraction Data, 12 Campus Boulevard, Newtown Square, PA 19073-3273 U.S.A.

#### ICAM 2004

The 8th International Congress on Applied Mineralogy (ICAM 2004) will be held in Aguas de Lindoia, Brazil, from September 19 to 22, 2004. ICAM 2004 is organized by the International Council for Applied Mineralogy (ICAM) and at the International Mineralogical Association - Commission on Applied Mineralogy (IMA-CAM).

The scientific program covers the following fields:

- advanced materials
- gem materials
- analytical instrumentation
- industrial minerals
- biominerals and biomaterials
- mineral exploration
- ceramic, glasses, and cements
- oil reservoirs
- cultural heritage
- ore mineralogy
- environmental mineralogy and health
- process mineralogy

The abstract deadline is October 1, 2003. For more information, you can write to Don Paktunc [dpaktunc@NRCan.gc.ca](mailto:dpaktunc@NRCan.gc.ca) or visit [www.icam2004.org](http://www.icam2004.org)





# NEW PUBLICATIONS 2003

## MINERALOGICAL ASSOCIATION OF CANADA

### Environmental Aspects of Mine Wastes

Editors: J.L. Jambor, D.W. Blowes & A.I.M. Ritchie  
Short-Course Volume 31, 2003

This volume covers a wide spectrum of environmental issues related to mine-waste solids and effluents. Topics include mine-waste geology, hydrology, mineralogy, geochemistry, microbiology, drainage prediction, remediation, advances in ARD modelling, and case studies. The volume provides entry-level familiarization with the various topics of primary concern in studies of mining-related wastes, but also covers advances that have been made in these and related fields over the past decade.

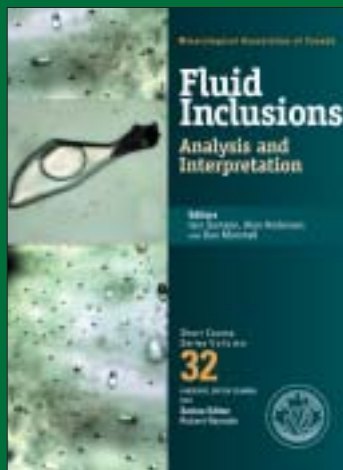
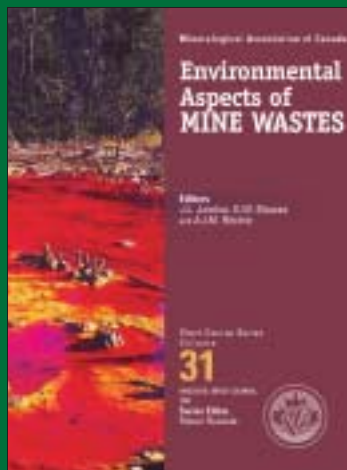
ISBN 0-921294-31-X  
SC31, 430 PAGES, 2003  
**US\$50\*/CANS50\*\***  
(member price US\$40/CANS40)

### Mineral Species Discovered in Canada And Species Named after Canadians

By L. Horváth

This annotated and illustrated compendium focuses on the 206 mineral species discovered in Canada or redefined from Canadian localities in the last 222 years. It also highlights 30 minerals named after Canadians but discovered outside Canada, and includes a section on obsolete names of mineral species first described from Canadian localities. The book also gives a brief historical overview of works documenting mineralogy in Canada from its beginnings in 1752 to the present. Appendices cover the chronology of mineral discoveries, individual type-localities, type-mineral specimens and their repositories, chemical classification of type-minerals, an author index, and general references.

ISBN 0-921294-40-9  
SP-6, 382 PAGES PLUS A 16-PAGE COLOR INSERT,  
HARDCOVER, 2003  
**US\$45\*/CANS45\*\***  
(member price US\$36/CANS36)



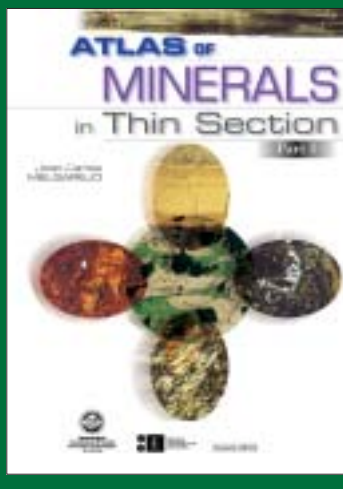
### Fluid Inclusions: Analysis and Interpretation

Editors: I. Samson, A. Anderson  
& D. Marshall  
Short-Course Volume 32, 2003

This short-course volume covers all the basic and many advanced aspects of the analysis and interpretation of fluid inclusions. It outlines what fluid inclusions are, what types of data can be obtained from them, the approaches and techniques that can be used to analyze fluid inclusions, how data are processed and interpreted, and where the limitations and pitfalls of the various techniques lie

ISBN 0-921294-32-8  
SC32, 384 PAGES, 2003  
**US\$45\*/CANS45\*\***  
(member price US\$36/CANS36)

**20 % discount for members**



### COMING IN THE FALL 2003 Atlas of Non-Silicate Minerals in Thin Section

J.C. Melgarejo, Coordinator  
Special Publication 7

The most complete atlas of non-silicate minerals in thin section (transmitted light).

More than 350 non-silicate minerals described.

Prices include shipping by surface mail  
\* outside Canada  
\*\* in Canada



Mineralogical  
Association of Canada  
Association minéralogique  
du Canada

P.O. Box 78087, Merilene Postal Outlet, 1460 Merivale Road,  
Ottawa ON Canada K2E 1B1  
Tel. & fax: (613) 226-4651

For each entry, the book features high-quality color photographs, a listing of all optical characteristics, an extensive list of occurrences and references.

Accompanying CD with all the photographs.

A joint publication with Edicions Universitat de Barcelona

ISBN 0-921294-39-5  
SP7, MORE THAN 350 PAGES, HARDCOVER

For additional information on our publications (table of contents, reviews) or to

**ORDER ONLINE**

**www.mineralogicalassociation.ca**