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## Mineralogical Association of Canada

### MAC-SPONSORED SPECIAL SESSIONS AND SYMPOSIUM AT MONTREAL 2006

The Mineralogical Association of Canada sponsored three special sessions and one symposium at Montreal 2006, its annual meeting held jointly with the Mineralogical Association of Canada, from May 14 to 17. Here are some highlights.

#### *Alkaline Igneous Systems: Dissecting Magmatic to Hydrothermal Mineralizing Processes*

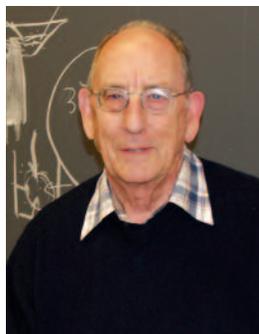
This highly successful symposium attracted over thirty oral and ten poster presentations and ran for all three days of the conference. It was organized by David Lentz (University of New Brunswick), André E. Lalonde (University of Ottawa), Stefano Salvi (LMTG, Toulouse), and Jeanne Paquette (McGill University). Keynote speakers included I.V. Veksler, G.N. Eby, A.N. Mariano, and A.E. Williams-Jones. The program was complemented by the MAC short course Melt Inclusions in Plutonic Rocks, organized by James Webster (AMNH); by a three-day post-meeting field trip to the Monteregian Hills, led by Nelson Eby (University of Massachusetts), David Lentz and Adrian Park (University of New Brunswick), and Serge Lavoie (NIOCAN); and by a one-day pre-meeting field trip to Mont Saint-Hilaire, led by Charles Normand (UQAM) and Peter Tarassoff (Redpath Museum). The presentations by this international group demonstrated that melt and fluid inclusion research is a common thread in discerning the relative roles of magmatic and hydrothermal processes from the deep mantle source regions to the near-surface formation of many ore deposits associated with alkaline magmatic systems.



Dave Lentz (left) and Ian Coulson welcoming participants

The first day of presentations was kicked off by an overview of the setting and origins of alkaline provinces by Kevin Burke (University of Houston) and his collaborators. Jeff Keith's research group (Brigham Young University) made two presentations related to metal enrichment associated with sulfide melts and degassing of alkaline magmas. Ilya

Veksler (GFZ Potsdam) presented new experimental studies on immiscible silicate and carbonatite melts, using new rapid-quench centrifuge methods. Roger Mitchell (Lakehead University) and Bruce Kjarsgaard (GSC) used experimental equilibria to test hypotheses on crystallization of natrocarbonatite. The remaining day focused on more primitive parts of these magmatic systems and included several case studies on the source and fractionation history of specific settings. On the second day, Nelson Eby provided an overview of the Monteregian (Canada) and Chilwa (Malawi) alkaline provinces, highlighting areas of current and future research in these interesting regions. The remainder of the second day evolved into presentations with ore deposit formation themes, highlighted by the keynote address on REE and Y deposits by Anthony Mariano (consultant) and James Hedrick (USGS). The final day included a particularly informative presentation by Carol Frost (University of Wyoming) on the new classification of alkaline rocks; it is part of a new IGCP project 510 started last year ([www.igcp-510.org/](http://www.igcp-510.org/)). The remaining talks focused on the petrogenesis of mineralization associated with various alkaline complexes, with an excellent keynote talk entitled "Rare-Metal Mineralization in Alkaline Igneous Rocks: The Role of Hydrothermal Processes" by A.E. Williams-Jones (McGill University) and S. Salvi (LMTG, Toulouse).



John Gittins

Papers on talks presented at the symposium are currently being solicited for publication in a special issue of *The Canadian Mineralogist*. This special issue will be edited by Roger Mitchell, Anton Chakhmouradian (University of Manitoba), and Dave Lentz and will honor the fundamental contributions of Professor John Gittins (now Emeritus Professor, University of Toronto) to the field of carbonatite petrology. We were very lucky to have John attend the meeting too. He, Roger Mitchell, and Keith Bell (Carleton University) initiated a lot of interesting discussion. Thanks gentlemen!

**David Lentz**  
University of New Brunswick  
and **André Lalonde**  
University of Ottawa

#### *Advances in Micro- and Nanoscale Analysis and Characterization of Earth Materials*

The objective of this full-day session, organized by Alan Anderson (St. Francis Xavier University) and Penny King (University of Western Ontario), was to introduce new and classic analytical techniques to geoscientists who share a common need to examine their samples at the nano- and microscale. Twelve different techniques were featured with application to a wide range of geological research topics, such as dissolution of uranium minerals, zircon geochronology, structural and chemical analysis of glasses and melts, mineral exploration, and radiation damage in minerals.

The advantages of sample preparation using a focused ion beam (FIB) and nanoscale characterization of materials using transmission electron microscopy were emphasized in a keynote address by Dr. Richard Wirth of the GeoForschungszentrum, Potsdam. Four other presentations demonstrated the capabilities of synchrotron radiation for spectroscopic analysis of glasses, fluid inclusions, and samples at extreme pressures and temperatures in a diamond anvil cell.

The session attracted a large and eclectic audience. The participants also learned about some new instrumentation in Canada and made the contacts needed to access these state-of-the-art laboratory facilities.

**Alan Anderson**  
St. Francis Xavier University

Abstracts of all talks presented at the meeting are available at:  
[www.gac.ca/ANNMEET/2006Abstracts.html](http://www.gac.ca/ANNMEET/2006Abstracts.html)

### Earth's Mantle: New Insights from Diamonds and Xenoliths

The special session "Earth's Mantle: New Insights from Diamonds and Xenoliths," organized by Maya Kopylova and Don Francis (McGill University), opened with an invited talk by Dr. L. Barron on the parentage of alluvial diamonds. Dr. Barron uses new techniques, such as diamond strain birefringence and Raman spectroscopy, to gauge the remnant pressure exerted on mineral inclusions by diamond entrainment. These techniques enable one to reconstruct a diamond's P-T path and thus distinguish between different P-T regimes of diamond formation, such as cold subducted slabs, cratonic upper mantle, and the lower mantle. Based on these methods and on the mineralogy of garnet, alluvial diamonds of southeast Australia were proposed to originate from a buried ultrahigh-pressure terrain.

The session continued with several talks on the redox state of mantle processes, such as melting and metasomatism. A novel conclusion was reached in the talk by Canil, Johnson, and Mihalynuk. The authors estimated the oxygen fugacity of formation of ophiolite peridotites using the variation of Sc and V as a proxy, and found it to be independent of the degree of melting. Such a pattern is inconsistent with closed-system behavior of oxygen, in which the redox state of the residue reflects their degree of depletion because  $\text{Fe}^{3+}$  is more incompatible than  $\text{Fe}^{2+}$ . On the contrary, the observation supports melting in a system that is open to oxygen, in

which oxygen fugacity is buffered externally, presumably by a mobile fluid.

Several presentations were devoted to inclusions in diamonds. Kopylova and Hayman showed that Fe-rich ferropicroclase in Rio Soriso diamonds may be enriched in Fe due to an origin at the base of the lower mantle in equilibrium with the post-perovskite phase. Donnelly et al. and De Stefano et al. presented new data on diamond inclusions in the Diavik and Jericho kimberlites, which are mainly peridotitic at Diavik and eclogitic at Jericho.

Many talks dealt with the petrology of peridotite and eclogite xenoliths in rocks ranging from the Muskox kimberlite (Schulze, Valley, and Hetman) to the Kirkland Lake kimberlite (De Hoog and Schulze) and the Cape Verde basalts (Shaw). A talk by Stachel et al. posed a provocative question: should we abandon one of the main paradigms of diamond exploration? Traditionally, exploration targets with harzburgitic (G10) garnets were considered more prospective than targets with lherzolitic garnets. Stachel et al.'s study of diamondiferous garnet xenocrysts from Diavik demonstrates that Ca metasomatism is not destructive to diamonds, and therefore lherzolitic garnets from refertilized former harzburgites may also coexist with diamonds in the mantle. The session was well attended and enjoyed by all participants.

**Maya G. Kopylova**  
University of British Columbia

### Metamorphism, Crustal Fluids, and Experimental Petrology: A Tribute to George Skippen

Dan Marshall (Simon Fraser University), Fred Ford (Inco), and Jo-Anne Goodwin-Bell (Carleton University) convened this special session to honor George Skippen, who recently retired from Carleton University. Keynote speaker Greg Dipple from the University of British Columbia gave a talk entitled "Physical Consequences of Mineral-Fluid Carbon Exchange: Examples from Metamorphism, Mineral Deposits, and Carbon Sequestration." The talk was an excellent blend of classic and modern metamorphic petrology. Professor Dipple did an exemplary job of summarizing Skippen's early work on carbonate metamorphism. He then built upon that work to explain how he and his group, working on  $\text{CO}_2$  sequestration, have used metamorphic petrology to study carbonate reactions in mine

tailings and how they propose to use those reactions as a partial solution to the ever-increasing global greenhouse gas budget.

Other talks in the session comprised an eclectic mix of metamorphic topics, including classic metamorphic phase relations (Ford), mapping (Goodwin-Bell), and the algebraic manipulation of metamorphic components (Gordon). The chairs, speakers, and audience did a wonderful job keeping the session entertaining and on time. Thus the group was able to move to a local "fluids lab" to continue the session. There they enjoyed a 50-year perspective on George's contributions given by Dave Watkinson (a friend and colleague of Skippen's) from Carleton University.

**Dan Marshall**  
Simon Fraser University



From left to right, the guest of honor, George Skippen, and session chairs Ian Hutcheon, Richard Moore, Terry Gordon, and Fred Ford

## CALL FOR NOMINATIONS FOR THE 2007 MINERALOGICAL ASSOCIATION OF CANADA AWARDS

### 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 scientist must be 40 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.

### 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.

### BERRY MEDAL

The Leonard G. Berry Medal is awarded annually for distinguished service to the Association. The award recognizes significant service 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 MAC, editor of *The Canadian Mineralogist* and its predecessor for 25 years and first winner of the MAC Past-Presidents' medal.

### PINCH MEDAL

The Pinch Medal is awarded every other year 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 through his generosity in making them available to the academic community.

**DEADLINE: December 31, 2006 (October 30 for the Pinch Medal)**

Check our website for additional details:

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