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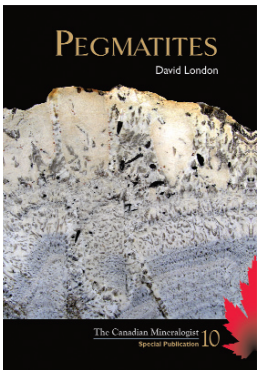
Mineralogical Association of Canada

INTRODUCING SPECIAL PUBLICATION 10
PEGMATITES



Pegmatites, by David London, is a lavishly illustrated, hard-cover, 368-page volume. It provides a thorough review of the current "state of the art" in pegmatite studies. In part I, "Geology," London provides a primer on the mineralogy, geology, and classification of pegmatites. A gallery of excellent specimen portraits illustrates fundamental characteristics of the most widespread mineral constituents. Field photos accompany the description of internal structural features of pegmatite bodies and detailed comments on specific deposits, and relationships to plutonic granites also are amply documented.

But the center of gravity of this treatise is in part II, "Origins," in which London consolidates his petrological model of internal pegmatite evolution and compares it with other concepts. The model was developed throughout some 25 years of realistic experimental work, the results of which closely simulated paragenetic and textural features of natural pegmatites. London makes a solid case for rapid disequilibrium-induced crystallization from liquidus-undercooled and commonly (though not necessarily) volatile-oversaturated melt as the principal pegmatite-forming process. This concept not only provides the best-to-date internally consistent explanation of all aspects of individual pegmatite bodies, but it also fits regional relationships in large populations of pegmatites, the connection to plutonic bodies, and metamorphic environment. One reason that the experimental results have yielded so much useful information is that throughout his career, London has used field-based observations to guide the experiments, and in turn to serve as tests of their applicability.

London concludes by listing key areas where studies are too few or even completely lacking. These include the relations of pegmatites to their source materials, their host rocks, and the timing and structural environment of their emplacement. He also points to some of the glaring holes and gaps in the field and laboratory databases, which include our knowledge of individual pegmatite bodies! A modern, thorough, multifaceted analysis of representative, well-exposed examples of diverse types of pegmatites is essential for further progress. So, far from being the last word on the subject, London's book aims to be a springboard for the next generation of mineralogists, petrologists, geochemists, and structural geologists, whose input is so critically needed in the realm of pegmatite studies.

A compact disk containing the illustrations accompanies the book. The copyrighted illustrations are provided for the purpose of educational instruction. As a bonus, the compact disk also contains Mineralogical Association of Canada Short Course Handbook 8 (1982), *Granitic Pegmatites*. Though some of the Handbook 8 chapters have been superseded by subsequent publications, one very important chapter is not: chapter 11, "Internal Evolution of Granitic Pegmatites," by Richard H. Jahns. This was Jahns' last publication on the subject and one of a very few with sole authorship.

2008 AWARDS

Hawley Medal to D. Barrie Clarke

The Hawley Medal is awarded to the authors of the best paper to appear in *The Canadian Mineralogist* in a given year. The award is named in honor of Dr. J. E. Hawley (1897–1965) who was a distinguished professor of mineralogy at Queen's University in Kingston, Ontario. The Hawley Medal Committee judged that of the many excellent papers published in 2007, the one written by Dr. D. Barrie Clarke of Dalhousie University, Halifax, Nova Scotia, was most deserving of the Hawley Medal. Entitled "Assimilation of Xenocrysts in Granitic Magmas: Principles, Processes, Proxies and Problems" (volume 45, pages 5–30), the paper provides an overview and sets the stage for a special issue of the journal entitled "Contaminated Granites," of which Barrie was one of the co-editors. This topic has immense relevance to petrologists, as the issue of primary melts forms one of the cornerstones of igneous petrology regardless of the composition of the system, basaltic through to felsic. Although the former has been at the center of igneous petrology for decades, relatively little attention has been devoted to rigorously assessing the degree of contamination in granitic rocks, hence the use of several p-words in the title of the paper—principle, processes, proxies, and problems.

The paper commences with a historical account of previous work, extending back to the time of Hutton and bringing us to more recent advances. The author then boldly asserts that uncontaminated granites do not exist, while at the same acknowledging that proving this assertion is a difficult task. What follows is a forensic account of documentation of the evidence supporting widespread contamination in granites. The paper addresses the issue of contamination based on field observations, meticulous petrography and mineral chemistry, and application of chemical thermodynamics and phase equilibria. The author utilizes several personal case studies from his years of working on the well-documented, peraluminous, and thoroughly contaminated South Mountain Batholith, in Nova Scotia, Canada. Tables and figures summarize and illustrate the myriad of processes involved in contamination—disintegration, assimilation, decomposition, diffusion, peritectics, ionic exchange, etc.—and a flowchart provides a comprehensive account of what might happen when foreign matter meets granitic melt. Although the paper focuses on granites, the principles have application to other petrological systems and, in this sense, should serve as a template for assessing the degree of contamination in other suites.

In summary, the Hawley Medal goes to the author of a paper that embodies all the criteria for an excellent scientific contribution: an eloquent presentation summarizing a diverse array of high-quality scientific data and observations that collectively address an important and relevant topic.

Young Scientist Award to Andrew J. Locock

The MAC Young Scientist Award is given to a young scientist who has made a significant international research contribution as a promising start to a scientific career. The winner for 2007, Andrew Locock, fulfills this requirement with his innovative research in the field of the structural mineralogy of uranyl phosphates and arsenates.

Andrew received his bachelor's and master's degrees at the University of Alberta in 1990 and 1994, respectively. He then spent several years working in industry on gold and diamond exploration projects in North and South America. He subsequently pursued his PhD at the University of Notre Dame with Dr. Peter Burns, where he was assigned the task of solving the crystal structures of a group of uranyl phosphates and arsenates—those brilliantly colored uranium minerals that mineral collectors prize, referred to as autunite-group minerals. Despite their abundance and adequate size, the structures of these important minerals remained unresolved due to their tendency to easily dehydrate upon exposure to air, with concomitant loss of crystallinity. As these minerals are now recognized as potentially playing an important role in the remediation of groundwater contaminated with uranium, resolution of their structures was becoming important. What Andrew did was both ingenious and simple: he kept the minerals in contact with an aqueous medium from the beginning to the end. Thus, he designed a purely hydrous experimental procedure that allowed him to synthesize his mineral of choice from a gel grown in an aqueous solution. Then he carefully loaded the synthesized crystal into a capillary while it remained in contact with its mother solution. Andrew collected an abundance of data from these minerals and for the first time elucidated their structures. His first papers based on this method, published in 2002, addressed the crystal structure of autunite, the namesake of the entire group. This publication was followed by a flurry of over 20 papers in 3 years, many published in *The Canadian Mineralogist*, which led to providing the definitive rewriting of this mineral group and characterizing more than 40 uranyl phosphates, arsenates, and chromates.

In summary, Andrew Locock's novel and creative approach provided the key to unlock the crystal structures of an important group of uranium minerals. This unique approach has been adopted by numerous researchers outside North America, and his work is widely cited. His contribution has in a very short time made a significant impact in mineralogical science and has also provided environmental science with some important insight into these minerals.

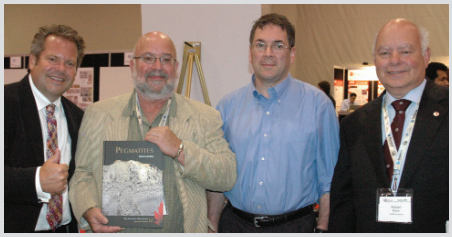
Berry Medal to Iain Samson

The Leonard G. Berry Medal is awarded annually for distinguished service to the Association. Iain Samson served the Association as finance chair for nine years. He took over the position of finance chair at a time when the MAC Foundation was in reasonable shape but when publishing costs were changing, *The Canadian Mineralogist* was expanding, and the effects of electronic publication, aggregation, and library budgets were unknown. At this time, the income of the Association was further impacted by the increasing value of the Canadian dollar. Iain's steady oversight of the budget kept the Association on the right track. Iain has also been a significant contributor to the intellectual and scientific health of the Association. He contributed to the MAC-sponsored PACROFI conference, was a co-organizer of a short course on fluid inclusions in 2003, and was a co-editor of the short course volume entitled *Fluid Inclusions: Analysis and Interpretation*.

Iain is a full professor in the Department of Earth and Environmental Sciences at the University of Windsor. His research interests revolve around the geochemistry and mineralogy of hydrothermal systems and the origin of hydrothermal mineral deposits.

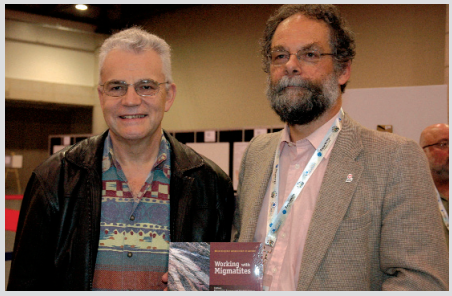
Read about our Peacock Medalist on page 152.

The Mineralogical Association of Canada launched its two latest special publications at its annual meeting in Quebec City. A special book-signing event was held on Tuesday, May 27.



FROM LEFT TO RIGHT, Brad Kitchen (President, Eagle Hill Exploration), David London (University of Oklahoma), Lee Groat (University of British Columbia), and Bob Martin (McGill University). Eagle Hill Exploration provided a substantial grant-in-aid of publication to help with the printing costs of *Pegmatites*. We thank Brad and his associates heartily for this generous gesture and Lee Groat, who was instrumental in arranging this grant.

Editor Bob Martin with Ed Sawyer, author of *Atlas of Migmatites*



Michael Brown and Ed Sawyer organized a very successful short course on migmatites, which was held immediately prior to the GAC-MAC meeting, and co-edited the accompanying short course volume 38, *Working with Migmatites*.