NEWSLETTER OF THE MINERALOGICAL ASSOCIATION OF CANADA

NOUVELLES DE L'ASSOCIATION MINÉRALOGIQUE DU CANADA

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EDITORIAL

NOT ALL IS DOOM AND GLOOM: SOME LIGHT

This is my last editorial as President of the Mineralogical Association of Canada. It has been a pleasure and honor to serve as President of the Association. The amount of volunteer service performed by Members of Council and the Executive is phenomenal. This service amounts to another part-time job (or more) freely offered to the Association. It has been a pleasure to work with these dedicated people. I sincerely thank them all for their advice and support.

My earlier editorial on the state of the mineralogical sciences obviously struck a cord. The number of comments and replies was more than I ever expected. Most of these were printed in a previous Newsletter. Most of the comments indicate a concern for the state of the mineralogical sciences. Concern for the state of science in general is increasingly brought to our attention. For example, the recent ruling of the Kansas board of education regarding evolution is causing the concern to be discussed in several forums, for example the latest issue of Geotimes. The attack was not just against evolution, as we understand the term, but was expanded to include something called 'Macroevolution.' A topic that falls in the 'Macroevolution' category is the Big Bang description of the origin of the Universe.

However, not all is doom and gloom. Several initiatives are underway or being planned to do something about the situation. In Canada, the big news is the announced funding for the Canadian Light Source facility in Saskatoon, a source of synchrotron radiation for X-ray studies of materials. Another is the plan for several sessions and symposia at the coming meeting in Calgary on the present state and future development of the Earth sciences. Your Association is a co-sponsor of several sessions on the present state and future prospects for several areas of Earth sciences. I would urge all members (and other readers of this Newsletter) to look at the web page for GeoCanada 2000 and, if possible, contribute to the discussion by attending the meeting. The web page can be viewed at http://www.geocanada2000.com.

The Canadian Light Source is a major research facility that can profoundly affect research in the Earth sciences. Because the intensity of the radiation is so high, the structures of small samples can be determined. In addition, the wavelength of the radiation can be selected to ensure that the best structural data are obtained. Don Baker of McGill University is coordinating a drive to place an X-ray microprobe on a beam line at the Canadian Light Source. The funding scheme, as is common in this day and age, requires matching funds, preferably from the private sector. Raising such funds is a difficult task. If you could help in any way, I am sure Don would welcome it. He can be reached at donb@eps.mcgill.ca

Again, thank you for allowing me to serve as President of the Association; it was an honor that I will always remember. I wish all a great new millennium and look forward to seeing as many of you as possible in Calgary this spring for GeoCanada 2000. ❖

Jim Nicholls, President
nicholls@geo.ucalgary.ca

SUMMARY

This newsletter constitutes an insert to
The Canadian Mineralogist, Volume 37, Part 6

FROM THE MANAGING EDITOR

Last September, I had the chance to take part in the annual Friends of the Grenville field trip. It was a special week-end as my son David was accompanying my husband and I. It was David's second Friends of the Grenville trip. The previous one was 20 years ago when he was a 10-month old, happily bouncing along in the backpack. How time flies!

David (right) and his dad

I always marvel that such an informal organization as the Friends of the Grenville Club can survive but it does. And every year a group of 30 to 50 friends of the Grenville gather in Quebec, Ontario or the United States. These annual field trips offer a wonderful opportunity to have ideas tested and to benefit from the expertise of a large number of Grenville experts all gathered in one spot. Next fall's field trip will be led by Sharon Carr of the University of Ottawa and two years from now, Bob Dymek and Tomas Feininger plan to take us to visit the anorthosites east of Quebec City. If you want to be kept informed of upcoming field trips, please get in touch with Louise Corriveau (lcorriv@nrcan.gc.ca) or Tony Davidson (tdavidso@nrcan.gc.ca) who will gladly put you on the electronic mailing list.

One of the most enthusiastic members of this informal group dedicated to fostering and maintaining communication between geoscientists working throughout the Grenville Province was Jamie Bourne, professor at Université du Québec à Montréal. Many will remember Jamie for his caring attitude, his wonderful laugh. Jamie passed away in November. We will all miss him.

This year's offering was in the Western Hudson Highlands of southern New York where we examined the Reading Prong, a Grenville re-entrant in the Appalachians, about 30 km north of New York City. The weather was truly glorious. We had many opportunities to walk along trails and to admire the breathtaking scenery and the lush vegetation. Geologywise, this trip had more than its share of disagreement. It was a real eye-opener for the students on the field trip who did not realize the extent to which geologists can disagree. Was the hot question whether or not there was subduction around 1,3 Ga? No, it was a lot more basic: did these rocks represent a metavolcanic sequence?

The field: a great place to teach. Louise Corriveau and students.

This really brought home the fact that the ultimate test is looking at the rocks in the field and that high-grade metamorphic terranes represent a real challenge for the field geologist and are not for the faint of heart. My petrology professor F.F. Osborne used to say: "Describe what you see. Interpretations can change but a good description will always stay."

In closing, I would like to remind you that this is your Newletter. It is a forum to address issues, to share information with your peers. So use it! ❖

Pierrette Tremblay
Mac_amc@hotmail.com

Wilderness at New York's door

ASSOCIATION NEWS

THE CANADIAN MINERALOGIST SOON ON THE WEB

At its last meeting, MAC Council gave the go-ahead for electronic publishing of *The Canadian Mineralogist* in parallel with the publishing of a paper version starting with the January-February issue of 2000. We have retained the Research Press of the National Research Council to host our web site and to look after the electronic publishing of our journal. With your 2000 membership fee, you will have access to the electronic version of the journal at no additional cost.

Last May, the Publications Committee was given the mandate to make recommendations to Council about electronic publishing. Things are moving extremely fast in the field of parallel publishing of journals. What seemed a distant possibility just a couple of years ago is now at our door. Here are some of the things we found.

All commercial publishers are on-line or will be shortly. Among mineralogical journals, the *Mineralogical Magazine* is going on-line at the beginning of 2000 and the *Journal of Petrology* has been on-line since the beginning of 1999. MSA has started an electronic-only journal while maintaining *American Mineralogist* as a paper-only journal.

Enquiries to libraries have shown that they expect journals to be available both on-line and in a paper version. Even though nobody can predict the future, most people feel that libraries will subscribe to paper copies until they feel secure that archival problems have been solved; that is, until they are sure that the electronic files will still be accessible fifty years from now. Electronic publishing has in fact increased costs to libraries, not decreased them, so there is an even greater pressure on ever decreasing funds. Some libra- ries have access to additional funds for subscribing to electronic journals

Electronic publishing will not be free access. It will still be costly since a large part of the cost in publishing a journal is for editorial activities, lay-out, and archiving. And when an organization publishes both a paper and an electronic version, costs are actually higher.

The National Research Council of Canada (NRC) Research Press has been publishing scholarly journals since 1929. NRC, a not-for-profit government organization, has made significant investments in developing electronic publishing capabilities. It started investigating electronic publishing in 1996. All of the fourteen journals it publishes are now available in both paper and electronic format. NRC also hosts six other electronic journals on its web site and provides access to an other one. It also offers its expertise to Canadian scientific organizations.

We expect to continue the publication of the paper version of *The Canadian Mineralogist* pretty much as we do now. Once an issue is ready to be sent to the printer, a cd-rom of all the files will also be sent to NRC Research Press. The issue will be on the web within two weeks. So you will have access to the web version a few weeks before you receive your paper copy or a few months if you are an overseas member. A real bonus for you, our members.

We see many advantages to form an alliance with the NRC Research Press to develop the electronic version of our journal:

- We take advantage of the expertise developed by the NRC Research Press (millions of dollars later). In getting all of its fourteen journals on-line, it has most likely ironed out the bugs.
- This allows us to move toward electronic publication quickly and efficiently for the first issue of 2000.
- The close links between NRC Research Press and the National Library of Canada ensure that volumes of *The Canadian Mineralogist* will be archived indefinitely.
- The continuity that an organization devoted to the support of scientific societies in our country could give to this new project seems important to us.
- We will be able to take advantage of new developments (search capabilities). So far NRC journals are available as PDF files, so you can print a copy that is identical to the Journal. NRC is also investigating HTML-type language.

How will it work? To access the journal, you will have to go to the MAC web site and get to the journal page. Abstracts will be accessible to all. If you want to access a paper, a window will appear and ask you for your password. This password will have been provided to you by NRC.

How much will it cost ? For 2000, access will be free to all our members. MAC has not yet finalized a fee structure for 2001. As an example, here is the fee structure NRC has worked out for its publications and that we will certainly consider. For individual members, the electronic version would be provided free with the printed version. People wishing an electronic version only would pay 90% of the price of the paper copy.

We are very excited to start 2000 with a bang and we look forward to receiving your comments and feedback.

Pierrette Tremblay
Publications Committtee Chair

Robert F. Martin
Editor, *The Canadian Mineralogist*

DID YOU KNOW THAT:

Of the more than 3700 mineral species,

- 45% are named in honor of a person, typically a geologist or mineralogist
- 23% allude to discovery localities
- 14% are named for their chemical composition
- 8% refer to distinctive physical properties
- 8% owe their names to a combination of personal, geographical, chemical or physical terms

From Encyclopedia of Mineral Names

ASSOCIATION NEWS

HIGHLIGHTS OF THE OCTOBER 1999 COUNCIL MEETING

The October meeting of MAC Council was held at the University of Calgary. Council met the Local Organizing Committee of GeoCanada 2000, to be held at the University of Calgary from May 29th to June 2nd. This year, the abstracts will be available on a CD-ROM. The Local Organizing Committee estimates that more than 5000 scientists will attend the meeting. The Sudbury meeting in 1999 was financially successful with an anticipated surplus of $75,000.

IMA 98 meeting

The IMA 98 meeting sponsored by MAC ran a surplus of $122,409.26. Twenty percent of that sum will be returned to the local organizing committee at the University of Toronto. A request from IMA to provide them with $25,000 out of that surplus was granted. A sum of $20,392 will be transferred to the general operating fund of MAC to cover the cost overun of the short course run at IMA. The remaining surplus will be deposited in the MAC Foundation Fund, to provide scholarships for students.

From the Treasurer and the Finance Committee chair

Ian Samson conducted a revenue versus expenditure analysis on the past years of operations and recommended no increase in membership fees for 2000. This will have to be reviewed for 2001 in light of our financial status at the end of 1999 and of the increased costs of publishing electronically in addition to a paper version.

The audited 1998 financial statement presented by Mati Raudsepp, Treasurer, is included in this newsletter on p. 8-9. As you will see, the 120K deficit mentioned in the previous Newsletter has shrunk to 91K. The printing cost of Special Publication 2, published in February 1999, had been placed by error in the 1998 fiscal year.

Publications coming up

The proceedings of a workshop on *The Health Effects of Chrysotile Asbestos* will be published shortly as a supplement to *The Canadian Mineralogist*. Watch for it!

Short-course Volume 28 on *Tracing Fluid Histories of Sedimentary Basins* will be available in May 2000.

Nominations for 2000-2001

The Nominating Committee has made the following recommendations for 2000-2001. Norm Halden has been nominated as incoming vice-president. Greg Dipple, Ron Peterson and Alan Anderson have been nominated councillors for the years 2000-2003.

■ **Norman M. Halden** graduated with a Ph.D. in Geology from Glasgow University in 1983. His thesis was on the emplacement of granites in the deep levels of a wrench fault zone in central Finland. In 1983 he took up a faculty position at the University of Manitoba with responsibilities for teaching in geochemistry and petrology and management of the geochemical analytical facilities. He has gone on to contribute to the development of microbeam analytical techniques, principally high- and low-energy PIXE, and image analysis. He is currently working on dynamical modeling of oscillatory zoning patterns in minerals and maintains an active field-based research program in the Thompson Nickel Belt and Eden Lake district of northern Manitoba. His work on zoned minerals and microbeam analysis also underpins a new research thrust on using otoliths to assess trace element analysis in the environment. He is currently Professor and Head in the Department of Geology at the University of Manitoba.

■ **Greg Dipple** is a metamorphic petrologist and an Associate Professor in Earth and Ocean Sciences at the University of British Columbia. He examines the chemical, thermal, rheological, and mineralogical consequences of fluid flow in the crust by deciphering the history of fluid flow recorded in exhumed rocks. Towards this end, he employs two complementary research strategies: **1)** analytical and numerical modeling of heat flow, fluid flow and mineral reaction, and **2)** field-based study of mineralogical, chemical and textural evidence for fluid-rock interaction. Recent work has focused on the role of mineral reactions in creating and destroying permeable networks during metamorphism. Essential to these studies is documentation of the identity and distribution of mineral assemblages in field areas such as the Horsethief Creek contact aureole and the Isk wollastonite skarn (both in BC). Greg hails from Pembroke, Ontario, and received a B.Sc. from Indiana University and an M.A. and a Ph.D. from Johns Hopkins University (under the tutelage of John Ferry). He has been a faculty member at UBC since 1992.

News from the subscription manager

More and more orders are received via the web site (www.mineralogicalassociation.ca). The office staff is looking forward to working with a new database that should simplify reporting and keeping track of operations. Here are some interesting membership statistics. The mainstay of our organization is the corporate membership, so make sure you encourage your library or your company to keep subscribing to the journal.

	Corporate Members	Individual members	Student and retired members	Life members
Canadian	48	148	85	18
USA	247	111	47	13
International	169	140	39	17
Total	465	399	171	46

ASSOCIATION NEWS

■ **Ron Peterson** (H.BSc., Western,1974, M.Sc. McGill, 1977, Ph.D. Virginia Polytechnic Institute and State University, 1980) is an Associate Professor in the Department of Geological Sciences and Geological Engineering at Queen's University. Dr. Peterson specializes in X-ray and neutron diffraction using both powders and single crystals. He has investigated a wide variety of mineralogical problems, including order/disorder behavior in spinels, quantitative analysis of mineral mixtures with Rietveld refinement of powder diffraction data and the crystal chemistry of metal sulfates occurring in mine waste. Dr. Peterson recently designed and built a teaching kit to help grade 4 teachers present the geology requirements of the new science and technology curriculum of the Province of Ontario. The kit weighs 10 Kg and includes 43 rocks, minerals and fossils as well as teaching guides and worksheets for 6 weeks of study. Currently Dr Peterson is the Director of Continuing and Distance Studies for Queen's University. Ron loves to play hockey and sail and lives with his wife JoAnne and Eric, Mary and Molly on Wolfe Island which is the largest of the Thousand Islands.

■ **Alan Anderson** received his Ph.D. from Queen's University, Kingston, Ontario. In 1989, he joined the faculty of St Francis Xavier University where he is currently an Associate Professor and Department Chair. From 1991 to 1993, he was a visiting scientist at Virginia Tech in the Fluids Reseach Laboratory. His research focuses on the study of late stage magmatic and hydrothermal ore-forming processes, the development and application of fluid inclusion methods, and synchrotron radiation spectroscopic studies of hydrothermal fluids using the hydrothermal diamond anvil cell and synthetic and natural fluid inclusions.

Student prize

Kristina H. Giles from Acadia University was one of our student award winners in 1999. Our apologies for not having included her in the list published in the previous Newsletter.

THE MAC FOUNDATION AWARDS ITS FIRST SCHOLARSHIP

In June, a subcommittee composed of Jeanne Percival, Yuanming Pan and Jonathan Fowler studied all the applications received for the MAC Foundation award and recommended that the first scholarship be awarded to Shannon Farrell, a Ph.D. student at the University of Western Ontario.

Shannon Farrell, first winner of the $10 000 MAC Foundation award

For his Ph.D. thesis research, under Dr. Michael Fleet, Shannon Farrell is using synchrotron radiation X-ray Absorption Spectroscopy (XAS) (Sulfur K- and L-edges XANES and EXAFX) and X-Ray powder and single–crystal diffraction to investigate the chemical states and structure of sulfur in metal sulfides, basaltic glasses, and oxidation products of sulfides. He is particularly interested in understanding the detailed features of the near-edge X-Ray Absorption Near-Edge Structure (XANES) and proposes to do this by systematic study of monosulfide solid solution series, as well as through multiple scattering calculations. Synchrotron radiation XANES spectra are obtained at the Canadian Synchrotron Radiation Facility on the Aladdin storage ring, University of Wisconsin. The S XANES spectra give information on both the chemical state of S and the participation of metal 3d orbitals in M-S bonding. He is also investigating the chemical state and coordination of S in basaltic glasses. Sulfur has a critical role in magmas, both as an important component in redox equilibria and as a complexing agent for precious and base metals. The ore-forming potential of magmas is closely related to the content and chemistry of S. The chemical state of S is little understood, and synchrotron radiation XAFS is the most promising tool yet to investigate it. The remediation of mining waste is a significant problem in modern mining operations. Farrell uses S XANES to study the chemical state of S in various metal sulfides oxidized both in air and hydrothermally in sealed silica glass tubes. His research topic is leading edge for mineralogy and geochemistry and very relevant to Canada's resource-based economy. The first of these studies is now published [S.P. Farrell and M.E. Fleet, Solid State Communications 113 (2000) 69-72].

Shannon graduated from St. Francis Xavier University in Antigonish, Nova Scotia, his home town, with a B.Sc. in chemistry in 1994. During his final year, he took geology as an elective and got interested in the potential applications of chemistry in geology. He did a master's thesis at Lakehead University, Thunder Bay, where he studied perovskites under the supervision of Dr. Roger Mitchell. He started his Ph.D. in the fall of 1997. Patrick loves to travel and play outdoor sports. He has becomes heavily involved with the outreach activities at the University of Western Ontario, which has given him a taste for teaching.

THE EDITOR'S CORNER

PRODUCING THE CANADIAN MINERALOGIST : A TEAM EFFORT

For this fireside chat, I imagine myself in a big rocking chair right next to the fireplace. What an appropriate setting two days before Christmas! The last-minute shopping is finally done, but many Christmas cards are not yet sent, and the final exams are not yet corrected. But certain things can wait, can't they? What does have priority in this very hectic time of the year is the preparation of the December issue of *The Canadian Mineralogist.* I have worked very hard lately to get back on track. At this point, all proofs of articles destined for the final issue of volume 37 of our journal are out there, the last ones being mailed out to the respective authors yesterday. I will get these proofs back from the authors in early January. Note that I have already read those proofs, and have transmitted MY corrections to **Jean-Claude Côté**, our typographer, who lives in Lévis, near Québec. In this way, most (>90%) of the corrections will have been made by the time the authors return their proofs to me in January. As usual, it will be up to Pierrette Tremblay later to go over the final proofs, looking over Jean-Claude's shoulder to make sure that everything is fine before the big red button is pushed. I really value Pierrette's final look at the proofs of every issue. In my opinion, it is important to have someone there with geological training to make sure that the technical terms are properly corrected, in cases where there are last-minute questions about my handwriting.

The complication in producing the December issue lies with the production of the annual index, which must await the full pagination of the December issue before being completed. As in past years, **Dr. J. Douglas Scott**, consulting geologist and mineralogist residing in Timmins, compiles the annual Subject and Author index. Doug must of course work quickly. What he transmits to me arrives in an electronic format. Both of us spend the time that it takes to provide as flawless an index as possible. Our philosophy clearly departs from other operations we know about!

My point in going over these details is to demonstrate, if any demonstration still is necessary, that the production of *The Canadian Mineralogist* is definitely a team effort. Many other people spend a lot of time, effort, and money (courier costs, *etc.*) in making it happen. I am referring to the numerous referees that exercise quality control by ensuring timely reviews of the manuscripts that they have accepted to review, and to the people who choose those referees in the first place, the sixteen Associate Editors. And of course, there is the unwavering support of Vicki Loschiavo who sees to it that what the author sends in gets massaged into the proper format before the typographer gets the manuscript in electronic form.

May I take this opportunity to thank the four Associate Editors who are stepping down after finishing their three-year term of office? I am very grateful for their time, freely given to contribute to the success of this major venture (and adventure!). **Professor Luke L.Y. Chang**, of the University of Maryland, has covered the area of sulfides, sulfosalts, sulfates and carbonates, including the area of phase-equilibrium studies. **Professor Giorgio Garuti**, of the University of Modena, Italy, covered the fertile field of the platinum-group minerals. I am not letting him go so easily. He has accepted to help me with the bulge of submissions anticipated in about nine months, in connection with the Louis J. Cabri special issue, just conceived. More about that at another time. Then there is **Andrew C. Roberts**, of the Geological Survey of Canada, who specializes in new mineral species, and in particular secondary oxysalts of selenium, tellurium, chromium and mercury. As our hard-working national representative on the Committee on New Minerals and Mineral Names of the IMA, he was very well placed to contribute valuable expertise to the Editorial Board. I should add that this is the end of Andy's second three-year term of office. And finally, there is **John F. Slack**, of the U.S. Geological Survey in Reston, specialist in ore deposits, and in particular those of exhalative (volcanogenic) type. John has a soft spot in his heart for tourmaline-group minerals, having published widely on their role in such exhalative deposits. I shall miss his expert advice and, of course, that of the other members stepping down next week.

How do I propose to continue, without input from these Associate Editors? Well, I have had to scan the horizon for others who are committed to excellence in one or more of the five branches of the Earth Sciences covered by the journal, *i.e.*, crystallography, geochemistry, mineralogy, petrology and ore deposits. Thus I am very pleased to introduce to you the five people who have accepted to serve the Association in this way. **Professor James E. Mungall**, of the University of Toronto, will cover igneous petrology and magmatic ore deposits. He also has experience in the areas of metasomatism and transport properties of silicate melts, so will have the breadth expected of an Associate Editor. **Dr. Ole Johnsen**, of the University of Copenhagen, became a candidate by the very fact that he chose *The Canadian Mineralogist* to publish three strikingly illustrated articles on eudialyte-group minerals in 1999. He will cover the area of mineralogy and structural crystallography, with a particular focus on the mineral species found in alkaline complexes, Mont Saint-Hilaire, for example. Of course, I can keep him busy! **Dr. Nigel Cook**, of the Geological Survey of Norway, is a specialist in gold, platinum-group elements, and related mineral species. He brings expertise in a central area of activity for this journal, the mineralogy of sulfide minerals. His expertise will certainly come in handy in connection with the Cabri issue. **Professor Mickey Gunter**, of the University of Idaho, specializes in physical properties and crystal chemistry of minerals, and is particularly fond of zeolite-group minerals. Although he is overworked, like the rest of us, he just couldn't say no. Finally, I am pleased to introduce **Professor Filippo Vurro**, of the University of Bari, in Italy. Filippo is a specialist in hydrothermal geochemistry and the mineralogy of sublimates. He has characterized new mineral species found in high-temperature fumaroles on Vulcano, in the Eolian Archipelago in the Tyrrhenian Sea,

THE EDITOR'S CORNER

off the coast of Sicily. He will cover, in particular, the area of sulfosalts, having recently coauthored two papers on exotic species of sulfosalts (and published in his favorite journal!).

I would be remiss if I didn't take this opportunity to express my thanks, on your behalf, to the other associate editors who are contributing to the impact of *The Canadian Mineralogist* on the world scene. Now entering their third year of a three-year stint are the following: **Peter C. Burns**, a regular contributor to this volume, is a structural crystallographer from the University of Notre Dame who has set out to systematize the secondary minerals of uranium. His work has obvious socio-economic impact when one considers the environmental implications of storing spent radioactive fuel. **Daniel J. Kontak**, with the Nova Scotia Department of Natural Resources in Halifax, is an economic geologist and geochemist who handles submissions dealing with mineralization, and in particular with fluid-inclusion studies. **Peter Lightfoot**, with Inco Exploration in Copper Cliff, Ontario, provides valuable expertise in the area of magmatic ore deposits involving Ni-Cu-PGE mineralization, for example. **Catherine McCammon**, like Peter Burns an expatriate Canadian, is based in Bayreuth, Germany; she covers applications of Mossbauer spectroscopy, and thus studies iron-rich minerals. She also handles papers in structural crystallography of iron-bearing minerals, and papers dealing with other spectroscopic techniques. **Roger H. Mitchell**, from Lakehead University in Thunder Bay, Ontario, is in the midst of his second term, covering alkaline rocks, kimberlites, crystal chemistry of oxides and silicates, geochemistry of carbonatites, and the list goes on. **George W. Robinson**, from the Michigan Technical University in Houghton and formerly of the Canadian Museum of Nature in Ottawa, brings valuable expertise in "classical" mineralogy, crystal chemistry, and also structural crystallography.

What about those who are beginning year two of their mandate? In alphabetical order, there is **James R. Craig**, who is a leading expert in the crystal chemistry and textural development of sulfide minerals, but also publishes on gold, electrum, and the products of their alteration. He hails from Virginia Tech in Blacksburg, Virginia. **Giancarlo Dell Ventura**, of the University of Rome III, covers the active field of infrared spectroscopy, as applied to the crystal chemistry of silicate minerals. He also is well placed to handle papers on exotic accessory minerals containing high-field-strength elements. **Lee A. Groat**, of the University of British Columbia, mainly covers submissions in structural crystallography, of which, as you know, there are quite a few. Lee also is very much involved in his own research in the study of granitic pegmatites and gemstone deposits. **John M. Hughes**, another hard worker who is in the midst of his second term of office, is well known for his work on the crystal chemistry of apatite-group minerals. He is a structural crystallographer based at Miami University, Oxford, Ohio, and gets quite a variety of papers thrown his way. Finally in this group, **Gregory Lumpkin**, with the Nuclear Science and Technology Organisation in Menai, Australia, covers submissions in the crystal chemistry of accessory minerals, expecially those that occur in evolved granites and granitic pegmatites. He also is well placed to handle papers on uranium- and thorium-bearing species, which commonly are partly metamict.

There are three more people that should be mentioned at this point. One is Associate Editor **Frank W. Dickson**, formerly of Stanford University (Yeah! My alma mater!), the University of California at Riverside, and now retired at the University of Nevada in Reno. Whereas most people in their retirement wish to drop out of the picture, Frank in fact volunteered his services when Associate Editor Eugene Foord passed away two years ago. He expressed the wish that he be considered to complete Gene's term of office. Since then, Frank has expressed the wish to stay on, covering hydrothermal geochemistry, gold mineralization, and granite petrology. I am delighted to be able to count on Frank's expertise and experience. Another is **Frank C. Hawthorne**, of the University of Manitoba, a return customer and former Associate Editor, who has taken the initiative to coordinate a thematic issue (or part issue) on those papers presented at the IMA meeting in Toronto in 1998 on the theme Mineralogy in the New Millennium. We hope to bring you those papers during the coming year. Finally, I mention **Robert T. Downs**, of the University of Arizona, another product of the brain drain, who volunteered his services many years ago to thoroughly check the contents of each structure-analysis paper. This in fact means taking the basic data, which are the fractional coordinates of each atom in the unit cell, and the symmetry operators imposed by the space group, and re-derive all interatomic distances, bond lengths, bond angles, etc. This is a labor-intensive process that uncovers in many cases inconsistencies and real errors, which the authors are instructed to clear up prior to publication. This is quality control at its best!

Do you as a reader sense that the journal continues to be in good hands? I hope that you do. Remember that as a society-run journal competing in many ways with the likes of Elsevier, the journal relies on the incredible generosity of a few people around the world. But you all have an important role to play in being part of the team. Your job is to try to boost our membership. Speak to students and fellow staff members about the benefits of a personal subscription to this journal. Compared to the Elsevier journals (as an example), a yearly subscription is very affordable. But at the same time, think of associates in third-world countries, for whom a yearly subscription is out of reach. Why don't you GIVE a professional colleague in a third-world country a subscription?

I had better wind down, or else the Newsletter Editor will do it for me! But I will be back in the next issue of the Newsletter for another installment of my fireside chat. I seriously doubt that I will run out of things to say. I must now return to the frenzy of getting ready for Christmas! I wish you and yours a happy and healthy New Year. And as one of my colleagues at McGill says so well, "Life is performance art, watch my show!".

Robert F. Martin
Editor

ASSOCIATION NEWS

FINANCES

As our by-laws require, this Newsletter includes our financial statements for 1998. Please take the time to look at them.

AUDITOR'S REPORT

To the Members of the Mineralogical Association of Canada

I have audited the balance sheet of the General Fund and the net assets of the Treasury Reserve Fund of the Mineralogical Association of Canada as at 31 December 1998 and the statements of revenue and expenditures and changes in cash resources for the year then ended. These financial statements are the responsibly of the organization'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 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 the financial position of the Mineralogical Association of Canada as at 31 December 1998 and the results of its operations and changes in its cash resources 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
Vancouver, BC
17 May 1999

THE MINERALOGICAL ASSOCIATION OF CANADA
BALANCE SHEET
as at 31 December 1998

	notes	1998	1997
CURRENT ASSETS			
Bank	4	$246,911	$197,076
Short term investments		26,556	91,000
Accounts receivable		59,297	24,716
Accrued interest receivable		4,912	7,979
Prepaid expenses		31,643	29,519
		369,319	350,289
Marketable Securities	5	352,419	322,275
		$721,738	$672,565
CURRENT LIABILITIES			
Accounts payable		44,683	88,113
Deferred revenue	3	140,101	56,309
		184,784	144,422
SURPLUS			
General fund		(91,459)	(1,851)
Treasury reserve fund		628,413	529,994
		536,954	528,143
		$721,738	$672,565

THE MINERALOGICAL ASSOCIATION OF CANADA
STATEMENT OF REVENUE and EXPENDITURES
GENERAL FUND
year ended 31 December 1998

		1998	1997
REVENUE			
Annual meeting		-	$33,000
Corporate		-	1,256
Donations		4,257	2,015
Special Publications 1		14,384	17,778
Special Publications 3		5,289	-
Grants & awards		6,000	-
Membership fees		51,832	53,484
Other		1,653	4,849
Posters		2,502	6,827
Short course notes		58,221	40,531
		$144,138	$159,740
Expenditures			
Annual dues		1,487	2,810
Bad debts		-	1,770
Bank charges		6,071	3,146
Foundation		644	2,282
Grants & awards		2,971	307
IMA 98		11,158	-
Insurance		4,361	-
Loss(gain) on exchange	5	7,312	1,570
Meetings		13,024	6,753
Office expenses		18,722	21,731
Postage & shipping		12,230	8,830
Promotion		21,530	21,435
Professional fees		6,029	2,800
Special Publications		58,752	52,556
Short course notes		63,731	18,555
Travel		5,724	7,135
		233,746	151,681
Excess (expenditures) over revenues		(89,608)	8,059
Surplus (deficit), beginning of year		(1,851)	(9,910)
SURPLUS (DEFICIT), END OF YEAR		($91,459)	($1,851)

THE MINERALOGICAL ASSOCIATION OF CANADA
STATEMENT OF REVENUE and EXPENDITURES
TREASURY RESERVE FUND
year ended 31 December 1998

	1998	1997
REVENUE		
Net earnings from the Canadian Mineralogist (schedule A)	68,672	(13,472)
Interest income	29,747	30,191
	98,419	16,719
NET ASSETS - BEGINNING OF YEAR	529,994	513,275
NET ASSETS - END OF YEAR	$628,413	$529,994

ASSOCIATION NEWS

THE MINERALOGICAL ASSOCIATION OF CANADA
SCHEDULE A - THE CANADIAN MINERALOGIST
STATEMENT OF REVENUE and EXPENDITURES
year ended 31 December 1998

	1998	1997
REVENUE		
Back issue. and miscellaneous issue sales	$6,640	$6,428
Donations	-	1,000
Grants	-	1,500
Membership fees	207,330	215,135
Reprints	19,863	15,085
	$233,833	$239,148
EXPENDITURES		
Editorial assistance	26,223	29,558
Grants & awards		-
Office Expenses	22,564	22,303
Postage & shipping	22,713	16,398
Publication	93,661	184,361
	165,161	252,620
NET EXPENDITURES OVER REVENUE	$68,672	($13,472)

THE MINERALOGICAL ASSOCIATION OF CANADA
STATEMENT OF CHANGES IN CASH RESOURCES
year ended 31 December 1998

	1998	1997
NET INFLOW (OUTFLOW) OF CASH RELATED TO THE FOLLOWING ACTIVITIES:		
OPERATING		
Excess expenditures over revenue for the year - General Fund	($89,608)	$8,059
Excess revenue over expenditures for the year - Treasury Fund	98,419	16,719
NET CHANGE IN NON-CASH WORKING CAPITAL ITEMS	6,724	85,014
Increase (decrease) in cash resources	15,535	109,792
INVESTING ACTIVITIES		
Acquisition of marketable securities		-
Disposal of marketable securities	34,300	50,000
Cash from (applied to) Investing activities	34,300	50,000
INCREASE IN CASH	49,835	159,792
Cash, beginning of year	197,076	37,284
CASH, END OF YEAR	$246,911	$197,076

NET CHANGE IN NON-CASH WORKING CAPITAL ITEMS

Decrease (increase) in marketable securities	64,444	40,725
Decrease (increase) in short term investments	(64,444)	(40,725)
Decrease (increase) in accrued interest receivable	3,067	199
Decrease (increase) in accounts receivable	(34,581)	9,313
Decrease (increase) in prepaid expenses	(2,124)	(14,769)
(Decrease) increase in accounts payable	(43,430)	56,397
(Decrease) increase in deferred revenue	83,792	33,874
	$6,724	$85,014

THE MINERALOGICAL ASSOCIATION OF CANADA
NOTES TO THE FINANCIAL STATEMENTS
year ended 31 December 1998

1. PURPOSE OF THE ORGANIZATION

The Association was incorporated on 5 August 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. SIGNIFICANT ACCOUNTING POLICIES

REVENUE RECOGNITION
The Association uses the accrual basis of accounting, matching revenue with expenditures. Membership fees are allocated 20% to the General Fund and 80% to the Treasury Reserve Fund.

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

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.

3. DEFERRED REVENUE

	1998	1997
Prepaid membership dues	140,101	56,309
	$140,101	$56,309

4. BANK

	1998	1997
Deposit on hand	19,285	-
Operating account - Canadian dollar	97,519	72,245
Operating account - US dollar	113,880	5,383
Visa account	6,543	6,793
MasterCard account	3,438	29,117
RBC Dominion Securities - cash account	6,246	83,538
	$246,911	$197,076

5. MARKETABLE SECURITIES

	1998	1997 note 7
Market value of all marketable securities, including short term investments	397,687	433,518
	$397,687	$433,518

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 $785,116.

7. COMPARATIVE FIGURES

The comparative figures are based upon financial statements which were reported on by another auditor.

FEATURE

CHARGE-COUPLED DEVICE (CCD) DETECTORS OF X-RAYS REVOLUTIONIZE MINERAL STRUCTURE DETERMINATION

The underlying atomic arrangement, or crystal structure, of a mineral governs its stability and therefore its occurrence. However, a detailed understanding of the relationships between crystal structures and mineral occurrences is still lacking. The extraordinarily complex mineral assemblages typical of low-temperature deposits challenge our understanding of mineralogy. However, the discipline of mineralogy has much to offer the Earth Sciences in this area: an understanding of the complex paragenesis of minerals based upon the underlying crystal structures is attainable. However, the structures of many minerals remain unknown, owing mainly to our limited ability to determine the structures of very small crystals, crystals that are twinned, and crystals with unusually large and complex crystal structures.

For the past 30 years, automated four-circle X-ray diffraction systems have been the mainstay of mineralogists interested in characterizing crystal structures. Although notable advances have occurred in diffractometer automation and crystal structure solution and refinement software, the basic approach to collecting data has remained unchanged. Many minerals refuse to give up their secrets easily. A major advance in our understanding of mineral structures requires a new technique. The introduction of CCD-based detector systems of X-rays to mineral structure studies promises to revolutionize the way mineralogists study crystal structures.

Owing to their short wavelength, X-rays are diffracted through crystal structures, in some ways analogous to the diffraction of light through a grating. However, as a crystal structure consists of a three-dimensional array of atoms, a three-dimensional diffraction pattern composed of many spots results when X-rays irradiate a crystal. To solve crystal structures using X-ray diffraction, it is necessary to accurately measure the locations and intensities of each of the spots. For a complex structure, several thousand to tens of thousands of spots must be measured. A conventional diffraction system utilizes a mechanical device (called a goniometer) to precisely position the crystal for the measurement of each diffraction spot in turn. Each spot is measured by an X-ray detector, typically a scintillation counter, by positioning the crystal so as to cause the diffraction spot to fall onto the detector. The spots are collected in serial, thus the time required for collection of the data for structure solution is dependent upon the number of unique diffraction spots associated with the crystal. This, in turn, depends upon the crystal symmetry and the size of the unit cell. Lower-symmetry crystals with large unit cells possess the most diffraction spots, and collection of data in serial for such a crystal typically requires several days to weeks of machine time.

In sharp contrast with a point detector, a CCD detector is an area detector that simultaneously measures X-ray intensity over a large area. This is achieved by using a phosphor to convert incoming X-ray photons into light photons. The light photons are collected in a fiber optics taper that delivers them onto a CCD chip, similar to those found in camcorders and digital cameras. The fiber optics taper consists of a bundle of fiber optics containing on the order of 100,000 individual components. Each of these components, or optical tapers, corresponds to a single pixel on the CCD chip. Thus, an electronic signal that may be downloaded to a computer is generated by the CCD chip that corresponds to the incidence of X-ray photons on the detector. An advantage of this detector system, as compared to a conventional point detector, is that it permits simultaneous observation of large slices of diffraction space. As such, the collection of data is actually done in parallel (i.e., many spots are collected simultaneously), greatly reducing the time required for data collection.

In some ways the collection of data using a CCD-based detector is a throwback to earlier days, when data was collected on a series of photographic films. However, whereas it might take several hours to obtain a single film exposure, followed by time in the darkroom, the CCD-based detector provides the same image in digital format in only a few seconds. Crystal structure determinations done with a CCD-based detector are based upon several thousand such "photographs», a prohibitive task using film techniques.

Collecting data using a serial diffractometer requires a knowledge of the exact orientation of the crystal because the crystal has to be positioned such that each spot falls onto the detector in turn. This prohibits the collection of data using very small crystals, as it is often impossible to obtain sufficient information to derive the precise orientation of the crystal. On the other hand, when using a CCD-based diffraction system, instead of collecting specific diffraction spots, all diffraction space is systematically collected, resulting in an electronic image of the diffraction character of the crystal. It is possible to collect data for a very small crystal, followed by the detailed analysis of the entire data set to derive the crystal orientation. This, in combination with superior sensitivity to X-rays, allows the CCD detector to be used for the solution of structures of crystals that are much smaller than were tractable using a conventional machine.

It is often difficult or impossible to isolate a perfect single crystal of a mineral of interest, owing to crystal intergrowths and twinning. Because the CCD-based detector is used to collect all diffraction space, it is often straightforward to handle imperfect crystals. Following

FEATURE

collection of the data, the location of all strong spots can be derived automatically, and subsets of spots corresponding to different crystal orientations can be identified. This makes it possible to determine the relations among the different components of the specimen, and in the case of twinning, the twin law may be identified. A subset of the data corresponding to one crystal orientation can often be derived, and may lead to the successful solution of the unknown structure.

Another advantage of the CCD-based detector for mineral structure analysis stems from the high resolution that can be attained. In the event that the structure has a long primitive unit-cell length, the serial diffractometer equipped with a point detector fails to resolve individual diffraction spots, and it becomes difficult to determine the structure. With the CCD-based detector, structures with primitive unit-cell lengths as long as 100 Å are attainable.

The introduction of the electron microprobe to mineralogy revolutionized our understanding of the chemistry of minerals, while substantially increasing the number of new species. This is because the electron microprobe permitted examination of rocks with superior spatial resolution. Although the CCD-based detector provides a huge improvement over conventional techniques in a laboratory setting, in combination with the intense X-rays available from a synchrotron, the CCD detector opens up new frontiers in mineralogy. Synchrotrons generate X-rays by manipulating beams of charged particles, either electrons or positrons, traveling near the speed of light in a storage ring with a circumference on the order of 1 km. The X-ray beam is many thousands of times more intense than can be generated by an X-ray tube in a laboratory, thus it is possible to study very small crystals. In much the same way as the electron microprobe did earlier, CCD based detectors, in combination with synchrotron radiation, will revolutionize our understanding of mineral structures by permitting the analysis of crystals as small as one micrometer in maximum dimension. New frontiers in mineralogy are within reach.

Low temperature minerals of environmental significance are receiving ever-increasing attention. Many of these minerals occur only as tiny crystals, and the structures have been unattainable using conventional techniques. Where the structures of these low-temperature minerals are known, our understanding is curtailed because structural studies have typically only been conducted for one crystal. It is therefore impossible to understand mechanisms of chemical variations in the structures, making it difficult to elucidate the relations between the structures and mineral occurrences. Now, owing to the speed with which data can be collected using a CCD-based detector, it is feasible to collect data for multiple crystals of the same mineral, permitting the development of a fundamental understanding of structural variability.

Unfortunately, the cost of a CCD-based diffraction system is very high: approximately $250,000 to $300,000 U.S. Mineralogists interested in applying this new technology to their research, but who do not have sufficient needs to justify an instrument, may be able to arrange collaborative research with one of the two laboratories in North America that have CCD-based systems that are dedicated to mineralogical research. These are the Environmental Mineralogy and Crystal Structures Laboratory at the University of Notre Dame and the X-ray Diffraction Laboratory at the University of Manitoba. When only very small crystals are available for study, synchrotron radiation will be required. The development of a micro crystallography facility at the GeoSoilEnviroCARS (GSECARS) sector of the Advanced Photon Source at Argonne National Laboratory, Argonne IL, is near completion. Researchers may apply for beam time, and beam-line scientists will be available to assist in the collection of data.

The application of CCD-based detectors to mineral structure analysis is in its infancy. There is little doubt that CCD-based detectors will become increasingly dominant in mineral structure analysis.

Peter C. Burns,
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REVIEWS

GLOSSARY OF MINERAL SYNONYMS

In January 1999, MAC published Glossary of Mineral Synonyms by Jeffrey Le Fourestier. We are pleased to reprint the following review, published by Rocks and Minerals. *We thank the editor of* Rocks and Minerals *for granting us the permission to do so.*

Glossary of Mineral Synonyms, 1999, by Jeffrey de Fourestier, Special Publication No. 2, Mineralogical Association of Canada, Ottawa, Canada, 448 pages, 21.5 x 30 cm hardbound, $50 Cdn (within Canada), $50 US (USA and overseas). (ISBN 0-921294-44-1).

To anyone interested in mineral taxonomy and nomenclature, whether from a professional viewpoint or that of the amateur mineral collector, the advent of a new book correlating obsolete, foreign, local, or rejected names with those now accepted by the International Mineralogical Association (IMA) must be welcomed with open arms. This work, an impressive volume designed as a companion to the recently published Mineralogical Association of Canada (MAC) Special Publication 1, Encyclopedia of Mineral Names, follows the same pattern as that text, and contains an astounding 35,000 entries cross-matched to their appropriate IMA designations.

A great deal of work went into this volume. The author's linguistic abilities include English, French, German, Spanish, Italian, Russian, and Chinese and his researches were carried out in libraries around the world. The introduction states that the information is intended for: "private collectors, museum curators, researchers, and those in the gem trade…" That puts it squarely in the realm of the readership of *Rocks & Minerals*. In fact, it pretty much requires readership at the level of the knowledgeable amateur because, as outlined below, it is a text which needs some interpretation to reach its full potential.

The major section of the book is, as one might expect, an exhaustive alphabetical listing of "All names of material that could be or has been misconstrued as a mineral". Each entry begins with the synonym, varietal, or discredited name in question in normal typeface, followed by an equals sign, then the modern, accepted name in boldface. Where there is additional information, such as the name of the person responsible for the synonym, it is added in parentheses, usually accompanied by "of". For example, the entry for "Pecherz" reads: "Pecherz = a) (of Karsten) Uraninite [Pitchblende], b) (of Hintze) impure Cuprite. Square brackets designate things such as other synonyms. Group names, such as Biotite, are both boldface and italicized. As far as the modern names are concerned, the book follows the IMA guidelines (Nickel & Grice 1998), although the author does prefer to capitalize mineral names.

In any research work of this nature, I think it fair to say that there are bound to be some questionable calls. For the most part, the terms are relatively simple, such as "Blockite = Penroseite". That's where the true value of this volume lies. If an old label reads "Blockite", there's a pretty good chance that the mineral so designated is penroseite. At the same time, while the 35,000 entries are unquestionably of immense value in determining names, there is no denying that a certain amount of interpretation may be required from time to time. For example, there are twenty-eight possibilities for "Bleispießglanze". To determine precisely what is meant by that term for any particular specimen or label, therefore, implies that other knowledge must be brought into play. The precise meaning may have to be worked out by a process of elimination through knowledge of locality, association, paragenesis, or whatever other factors may be available. As long as that is well understood, this book can be used to great effect.

In compiling this listing, the author has had an impressive array of contacts with professionals. There is a preface by Dr. Hugo Strunz, recognizing the work as one of importance as a helpful tool and quick reference. Acknowledged in the author's foreword are many others, including such notables as Dr. J. A. Mandarino, Dr. J. S. Coombs, Dr. Alexander P. Khomyakov, and the late Drs. Eugene Foord and Michael Fleischer.

Each new section or letter of the alphabet is headed by a fine black and white drawing of a mineral specimen executed by Russian mineralogist and artist Dr. Gregory Y. Ivanyuk, a researcher at the Geological Institute of the Kola Science Centre of the Russian Academy of Sciences (Apatity Murmansk Region). The book is rounded off with a bibliography of journals and texts, among which appear most of the major works concerned with mineral nomenclature in one way or another.

It would be hard to stress too much the usefulness of a book such as this. While others, such as Egleston (1892) and Clark [Hey] (1993) certainly exist, they are either out of date, incomplete, or very expensive. This is a much needed volume providing up-to-date information at a good price. If I have emphasized some aspects requiring special consideration, it is merely to ensure that the user is aware that there are few absolutes in the world of nomenclature. It is cheap enough to be affordable by individuals and institutions alike, and deserves a place on any serious collector's shelf.

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AN INTERESTING BOOKMARK

This web site can link you to 163 sites, almost all devoted to minerals, professional organizations, mineral dealers, mineral collectors, museums, Earth Science Departments, journals and more. A good starting point.

www.icrdl.net/yisabel/liens.htm

MEMBERS IN THE NEWS

NEW ROCKS FOR PETER RUSSELL'S GARDEN

Peter Russell has been recognized by University of Waterloo (UW), not only as an Honorary Member of the University of Waterloo – a title bestowed at the spring convocation – but also with the renaming of the Geological Garden, now officially known as the Peter Russell Rock Garden. The designation was approved by UW senate last spring.

The geological collection between the Biology and Math buildings began to germinate in Russell's mind in 1981 as a project for UW's 25th anniversary celebrations the following year. With funding from the Canadian Geological Foundation, Wintario, and a bequest from UW alumnus Malcolm Heaton, the first 20 tonnes of rock were planted in the garden in 1986.

Since then, the garden has blossomed with new donations every year – from mine owners, in memory of UW students and staff, and to mark the 40th anniversary of the co-op program at Waterloo – now bringing the total to more than 50 tonnes. Each specimen is marked with a cast bronze plaque providing information about the rock, as well as the donor.

In 1999, three new rocks were installed in the Peter Russell Rock Garden. The donations commemorate the life of Harry Verney Warren, known as the "father of biogeochemistry" and the recipient of an honorary degree from UW in 1975. Warren, who was not only a noted scientist but also an athlete and member of Canada's track team at the 1928 Olympics in Amsterdam, died on March 14, 1998, at the age of 93.

Two of the three specimens are from Warren's home province of British Columbia: Cascade coral granite, a "mountain-shaped" piece from Beaverdell, B.C., donated by Don Gunning and the quarry owners, Margranite Industries Ltd.; nephrite jade, a boulder from Wheaton Creek, B.C., with a dark green polished surface, donated by Jedway Enterprises Ltd.; and pink rhodonite, from Evelyn Creek, Yukon, from Jedway Enterprises Ltd. Assistance with the donations was also provided by Jim McDougall of Richmond, B.C., and Peter Morris of Waterloo.

Peter Morris, who donated funds to pay for the shipping of this specimen, and Peter Russell (right)

Russell retired from the Earth Sciences department in 1996 after nearly 30 years as a rock preparation technician, draftsman, and administrator-curator. Now that he's retired, Russell has limited his on-campus activities to serving as curator of the Earth Sciences/Biology Museum, where he conducts tours and talks for visitors; curator of the rock garden; co-editor of *Wat on Earth*, the Earth Sciences newsletter; and a contributor to *Waterlog*, the Earth Sciences alumni newsletter. In his spare time, he handles other public relations duties for the department, including conferences, brochures and tours

Peter in part of his garden

DEBATING ISSUES

I would like to comment on the discussion and proposal 4) What is the value of the geology-mining connection? as presented by Dr. Kretz in his guest editorial.

The research geology-mining company connection is a synergistic co-operation between two active facets of geology and should not be severed. I consider it to be a viable example of the science-technology interface. Technology builds on the research information generated by science, and further returns valuable research information back to science for further refining and modifying principles outlined by "basic science" research. The information gained through research and study of mineral deposits during exploration and mining has immensely contributed to our understanding of existing deposit models, led in the generation of new deposit models, and modified the way in which many geologic processes are viewed and understood. Consider for example, the increased understanding of many geologic processes (including such things as alteration, water flow, metamorphism, geochemistry, intrusive cooling, stable isotope systematics) brought about by the study of economic porphyry systems. Further, mining companies have been instrumental in funding and conducting research on various environmental issues including groundwater contamination, acid rock drainage, and possible health hazards of natural materials.

I do not consider the Bre-X scandal damaging to the discipline of geology. Cons and scams are a possibility in any life situation and vocation when large sums of money are involved. Private sector geologists I have worked with are careful to verify results and fully document their activities.

Confrontation between geologists and environmentalists cannot be simplified to a mining is bad, no development is good perspective. Our standard of living requires mining as an activity. Geologists play a role in the mining industry from exploration through remediation and mitigation. Cooperation between research and industry should be encouraged to improve our ability to more fully remediate mining sites.

Lee Pigage,
Yukon Government

WHY THE CANADIAN EARTH SCIENCES CRISIS?

As a long-time MAC member I have been an admirer of Canadian mineralogy and petrology for years; in my view these disciplines are still strong and are being enriched through geochemical and isotopic studies of the same or similar materials. Any decline in level of effort that has taken place mirrors the changes of emphasis in the same fields as in the US, and reflects the refocussing of governmental and academic research efforts in both countries away from resource development toward environmental and hydrologic issues. However, despite these evolutionary changes, in my opinion, Canada's contribution is not as apparent as it should be were it to be more effectively represented in published research.

To make my point, let me discuss the extraordinary Canadian Lithoprobe Initiative. For more than two decades, NSERC with considerable support from the academic, governmental and provincial surveys, and the mineral resource and energy communities, has funded an exceptional array of large regional Earth science studies, which though emphasizing geophysical sciences (seismic reflection and refraction, magnetic and gravity fields, etc.), also supports related topical studies, many within the sciences of special importance to MAC that are funded by an additional funding component. I have served on the international panels that evaluated Lithoprobe proposals and have strongly supported these with only some reservations having to do with taking on more data collecting tasks than there is expertise available to process and interpret the data. I have also been asked by NSERC for letter commentary on Lithoprobe progress reports. It is my opinion that the Lithoprobe research effort is a world-class program, and should have the potential to foster the development of an earth scientist of Tuzo Wilson's stature in almost every province. If these contentions are true, the research results of the Lithoprobe project alone should place Canada in the top few countries of the world in Earth Sciences. Why do some think that is not the case?

I believe that it is partly because the results have not been forthcoming in published papers that emphasize not only the specific regional Earth Sciences problems resolved, but their synthesis and application to global problems of a similar kind. Lithoprobe data have not been promptly published: typically 10 years elapse before a synthesis of a regional Lithoprobe project appears in CJES, and most of the component projects are well behind schedule and are significantly understaffed in both academic and governmental laboratories. CJES runs more than 6 months behind its publication schedule; much Lithoprobe-derived data is published there, given time. *The Canadian Mineralogist* is just beginning to catch up to its publication schedule, but I looked through the index for the last couple of years to see if Lithoprobe-related papers are of any significance to the contents, and they are not. If such a major national effort as Lithoprobe fails to attract the reader's attention because its results are not available in a timely way, is it a surprise that Canadian Earth Sciences suffers in comparison to worldwide science?

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DID YOU KNOW THAT

Tranquillityite was named after its discovery locality, in the Sea of Tranquillity, Moon. It was collected during the Apollo XI Mission

Encyclopedia of Mineral Names, p. 306.

OUTSIDE NEWS

INTERNATIONAL CENTER FOR DIFFRACTION DATA CLINICS ON X-RAY FLUORESCENCE SPECTROMETRY AND X-RAY POWDER DIFFRACTION

Fundamentals of X-ray Fluorescence Spectrometry
May 1-5, 2000
Covering basics of X-ray spectra, instrumentation design, methods of qualitative and quantitative analysis, specimen preparation and applications for both wavelength and energy dispersive spectrometry.

Advanced Methods in X-ray Fluorescence Spectrometry
May 8-12, 2000
Emphasizing quantitative methods, use of automated X-ray spectrometers, review of mathematical matrix correction procedures, and new developments in XRF.

Fundamentals of X-ray Powder Diffraction
June 5-9, 2000
Covering instrumentation, specimen preparation, data acquisition, and qualitative phase analysis.

Advanced Methods in X-ray Powder Diffraction
June 12-16, 2000
Emphasizing computer-based methods of data collection and interpretation, both for qualitative and quantitative phase analysis.

FOR FURTHER INFORMATION, PLEASE CONTACT:
Jeanne Ginsburg
Education Coordinator
International Centre for Diffraction Data
12 Campus Boulevard
Newtown Square, PA 19073-3273
Tel: (610) 325-9814
Fax: 610/325-9823
E-mail: clinics@icdd.com
Web-site: www.icdd.com/education/clinics.htm

INTERNATIONAL MINERALOGICAL ASSOCIATION COMMISSION ON ORE MINERALOGY

Announces a short course on
"MODERN APPROACHES TO ORE AND ENVIRONMENTAL MINERALOGY"
to be held at the **Geological Survey of Finland & Helsinki University of Technology , Otaniemi, Espoo, Finland, 11-18 June, 2000**

PRELIMINARY SHORT-COURSE PROGRAMME

Monday, June 12

ORE MICROSCOPY AND PHOTOMETRY A.J. Criddle

ORE TEXTURES AND ORE DEPOSITS C.J. Stanley & A.J. Criddle

TEXTURAL ASPECTS OF METAMORPHOSED SULFIDE ORES F.M. Vokes

TEXTURES OF SKARN ORE DEPOSITS N.J. Cook

OPTICAL MICROSCOPY IN STUDYING ORES AND MINERAL PROCESSING SAMPLES B. Grguric

Tuesday, June 13

ENVIRONMETAL INFLUENCE OF SULFIDE-RICH FORMATIONS K. Loukola-Ruskeeniemi

MINERALOGY OF OCHREOUS PRECIPITATES FORMED FROM MINE EFFLUENTS L. Carlson

ENVIRONMETAL MINERALOGY; MINERAL CHANGES DURING WEATHERING R.Herbert

THEORY AND APPLICATIONS OF MINERALOGY IN ENVIRONMENTAL STUDIES OF SULFIDE-BEARING MINE WASTES J. L. Jambor

THE LOW-VACUUM SEM: A PRACTICAL TOOL FOR ORE MINERALOGY B. Robinson

IMAGE-ANALYSIS APPLICATIONS TO MINERAL PROCESSING R. Lastra

Wednesday June 14

OPTICAL SPECTROSCOPY-ABSORPTION MEASUREMENTS AND INTERPRETATION U. Hålenius

IR AND MÖSSBAUER STUDIES IN ORE MINERALOGY H. Skogby

MODERN ELECTRON PROBE MICRO-ANALYSIS – PRINCIPLES AND PRACTISE B. Robinson.

THE PROTON MICROPROBE IN ORE MINERALOGY (MICRO-PIXE TECHNIQUE) L.J. Cabri

THE SIMS TECHNIQUES IN ORE MINERALOGY L.J. Cabri

HRTEM, AFM AND STEM TECHNIQUES IN MINERALOGICAL STUDIES D.Vaughan

OPEN-DAY PRESENTATIONS AND POSTERS

Thursday, June 15, will be reserved for the participants' oral and poster presentations.

PRACTICAL SESSIONS

Practical sessions in ore microscopy will be organised during the afternoons of June 12-14, 2000. Visits to various research laboratories in the Otaniemi campus area will be arranged during the practical sessions for those who cannot be accommodated because of limited number of ore microscopes.

FIELD TRIP

A one-day excursion on Friday, 16 June 2000 will be arranged in Tampere area, Southern Finland to the Proterozoic Kutemajärvi telluride gold mine operated by Outokumpu Mining Oy and to the Viitaniemi complex pegmatite quarry in Orijärvi.

On Saturday, June 17 special workshops will be arranged on:

1. DIAMOND INDICATOR MINERALOGY; FROM THEORY TO PRACTICAL STUDIES

2. PLATINUM GROUP MINERALOGY: FROM EXPERIMENTAL RESULTS TO PROCESSING OF PGE ORES

3. IMAGE ANALYSIS TECHNIQUES AND APPLICATIONS

FEES

Registration fee for the Short Course (including meals) $500 (US); Field trip participation fee (one day) $150 (US); Workshops $150 (US); One day participation (lectures/open day sessions/workshops) $150 (US).

LANGUAGE The official Short-Course language will be English. No simultaneous translation will be offered.

DEADLINES Extended Abstracts (maximum four pages) of the presentations on the open day of the Short Course should be submitted to the Short-Course Organisers by March 15th, 2000.

ENQUIRIES

Dr. Kari K. Kojonen
email: kari.kojonen@gsf.fi
Web page: www.hut.fi/Units/Geophysics

WHY COME TO GEOCANADA 2000?

- Oppportunity to take a look at the state of geosciences in Canada
- Get an overview of major national research initiatives
- See and hear strong technical and poster programs
- Learning experience through core sessions, field trips and short courses
- Exhibit floor of latest technologies
- Opportunity to see some of the classic geology surrounding Calgary
- Opportunity to network with colleagues and top professionals in the Earth Sciences
- Superb entertainment program planned
- Calgary and area tourist attraction

GEOCANADA 2000

The cross disciplinary millennium summit for Canada's geoscience leaders

May-29 – June 2, Calgary, Alberta

Mineralogical Association of Canada Short Course **GeoCanada 2000**, Calgary

Tracing Fluid Histories of Sedimentary Basins

*May **27-28** 2000*

Editor Kurt Kyser

Speakers

Eric Hiatt, Department of Geological Sciences and Geological Engineering, Queen's University,

Fred Longstaffe, Department of Geological Sciences, University of Western Ontario

Gerry Ross, GSC, Calgary

Ian Hutcheon, Department of Geological Sciences, University of Calgary

Bernard Marty, CNRS, Nancy, France

Kurt Kyser, Department of Geological Sciences and Geological Engineering, Queen's University,

Mineralogical Association of Canada
Association minéralogique du Canada

The purpose of the course is to illustrate the methods, techniques and approaches used to trace the fluid flow histories of sedimentary basins and demonstrate how to use this information to evaluate the economic potential (both metal and petroleum) of large basins. The results from these studies are prerequisite for constraining large – and restricted – scale flow models, understanding the evolution of the crust, and refining exploration and exploitation strategies for mineral and petroleum deposits. The specific basins to be discussed include Proterozoic basins in Canada and Australia, Phanerozoic and Mesozoic basins in Western Canada, and Mesozoic and Cenozoic basins in Europe.

Most of the material presented will be at a level of understanding for most upper undergraduate and graduate students although recent results and ideas presented throughout the presentations will appeal to both pure and applied researchers working in sedimentary basins.

Presentations will consist of 1-2 lectures from each speaker (an introductory lecture and one related to current results and ideas) so that the short course will last for 1.5 days, prior to the regular meeting.

Outline

- Tectonics and basins types of basins, tectonic settings, mechanisms of basin evolution and origin of fill, relation between size and tectonics, relation between economic potential and tectonics
- Actualistic and non-actualistic effects and tectonics-comparison of tectonic styles of Cenozoic, Mesozoic, and Phanerozoic basins
- Sedimentation and basin fill-sedimentology and stratigraphy—energy and source terrain evaluation
- Modern-ancient differences and similarities in sedimentation and style of fill
- Paragenesis of minerals in basins-field relations, petrographic techniques
- Fluid inclusions in detrital and authigenic minerals-quartz, the early fluids, salinities and temperatures, estimates of pressures
- Timing of fluid events-principles of radiometric dating, what does an "age" really signify, radiouraninite, salts, phosphates, sulfides, paleomagnetism as a fluid tracing tool, fission track and other techniques
- Stable isotopes as tracers of fluids
- Mineral reactions and equilibria-determining the chemical and physical properties of fluids in basins
- Tracing relatively recent basin histories-noble gas geochemistry, heat flow in basins, what do fluids present in basins reflect
- Paleo- and Meso-proterozoic basins
- Neoproterozoic basins
- Western Canadian basin
- Paris basin

Cost is **$ 353 CDN** (**$ 150 CDN** for students).
For additional information, see www.geocanada2000.com or contact kyser@geol.queensu.ca

CONFERENCES COMING UP

MARCH 5-8 2000

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

MAY 29-JUNE 2 2000

GEOCANADA 2000, Calgary.
The Millennium Geoscience Summit, joint meeting of Canada's major geoscience societies including the Mineralogical Association of Canada, the Geological Association of Canada, the Canadian Society of Petroleum Geologists, the Canadian Society of Exploration Geosphysicists, the Canadian Geophysical Union and the Canadian Well Logging Society.
See www.geocanada2000.com

JUNE 24-29 2000

The Clay Minerals Society 37th annual meeting,
Chicago, Illinois, Water Tower Campus of Loyola College, Chicago

Theme : Clays in the Past and Future Millennia

Symposia: Redox processes in clays, Archeology and clays, Agrichemicals and Clays, Vermiculites, Nanocomposite materials for the next millennium, Clays in the human future, Geology, Clay minerals in glacial stratigraphy

Field trip: Urban clays with stops at the Art Institute, gasoline station barriers, and Argonne National Lab

Workshop (Saturday June 24th) : Industrial uses of clays

General Chair:
Dr. Alanah Fitch,
Loyola University of Chicago,
6525 N. Sheridan Road,
Chicago, IL 60626;
tel.: 773-508-3119;
fax: 773-508-3086;
e-mail: afitch@luc.edu

AUGUST 6-17 2000

31st International Geological Congress,
Rio de Janeiro, Brazil.
For info:
Secretariat Bureau,
31st International Geological Congress, Av. Pasteur,
404. Anexo 31ICG, Urca,
Rio de Janeiro, RJ,
CEP 22.290-240, Brazil.
E-Mail: 31igc@igc.org.br
Website: www.31igc.org.br

SEPTEMBER 3-8 2000

Goldschmidt 2000,
Oxford.
For info:
P. Beattie,
Cambridge Publications,
Publications House,
PO Box 27,
Cambridge CB1 4GL Tel/Fax:
01223-333438.
Website: www.compublic.co.uk/science/conference/Gold2000

NOVEMBER 13-16 2000

Geological Society of America Annual Meeting,
Reno, Nevada.
For details:
GSA Meetings Department,
box 9140, Boulder, Co 80301-9140;
tel. 303-447-2020;
fax: 303-447-1133;
e-mail: meetings@geosociety.org

The Mineralogical Society of America

announces the 2001

GRANT FOR RESEARCH IN CRYSTALLOGRAPHY

From the Edward H. Kraus Crystallographic Research Fund with contributions from MSA membership and friends

and the 2001

MSA GRANT FOR STUDENT RESEARCH IN MINERALOGY AND PETROLOGY

from an endowment created by contributions from the MSA membership

The Grant for Research in Crystallography is a $3500 grant for research in crystallography. There are no restrictions on how the grant funds may be spent, as long as they are used in support of research. The only restrictions on eligibility for the grant are that the applicant must have reached his or her 25th birthday but not yet have reached his or her 36th birthday on the date the grant is given, and that the person is not a MSA Counsellor.

MSA Grants for Student Research in Mineralogy and Petrology are two $3500 grants for student research in mineralogy and petrology. Students, including graduate and undergraduate students, are encouraged to apply. There are no restrictions on how the grant funds may be spent, as long as they are used in support of research.

Selection will be based on the qualifications of the applicant, the quality, innovativeness, and scientific significance of the research, and the likelihood of success of the project. Grants will be made in January 2001. There are no restrictions on how the grant funds may be spent, as long as they are used in support of research. Application instructions and forms for the grants may be obtained from the MSA worldwide web home page, http://www.minsocam.org or Dr. J. Alex Speer, MSA Business Office, 1015 Eighteenth St NW Ste 601, Washington, DC, 20036-5274, USA (ph: 202-775-4344, fax: 202-775-0018, e-mail: j_a_speer@minsocam.org. Completed applications must be returned by June 1, 2000.

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

Any person or organization engaged or interested in the fields of mineralogy, crystallography, petrology, geochemistry and mineral deposits can become a meamber.

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

Individual membership	**$90**
Institutional and corporate membership	**$340**
Sustaining membership	**$600**
Student or retired membership	**$30**

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

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