



GEONEWS

January 2007



GREETINGS FROM THE HEAD



Welcome to the January 2007 issue of GeoNews, the Newsletter of the Department of Geological Sciences and Geological Engineering at Queen's. It has been an eventful year since our last Newsletter and we're excited by the opportunity to bring you up to date on what's happening in the Department. In the following pages, you'll find information

about: the results of the accreditation review of our geological-engineering undergraduate program; the arrival of our newest faculty member, Dr. Dan Layton-Matthews; awards and honours to our faculty and students; research news from faculty engaged in the study of "economic geology"; recent alumni events; the success of our fund-raising activities, with a big "thank you" to the many, many people who have donated; the history of Miller Hall as it reaches its 75th anniversary; Al Gorman's "Alumni Update"; and more. So, pull up a comfortable chair, get yourself a beverage of your choice and enjoy this issue of GeoNews.

Bob Dalrymple
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DEPARTMENTAL NEWS

Engineering Accreditation Results

Every few years, all engineering undergraduate programs are evaluated by the Canadian Engineering Accreditation Board (CEAB). Our recent history with the CEAB has been rocky. In 1997, we received a one-year notice that our accreditation would be withdrawn. In response, we revised our program and had our accreditation reinstated, but we have been on a short lease, with the need to report annually. During the 2005-2006 academic year, a thorough review was undertaken and the results have only recently been released: we received the best-possible outcome—a six-year accreditation, with no identified problems!

This represents very welcome vindication of the Herculean effort of many people over the last few years. In the longer term, Herb Helmstaedt deserves thanks for hiring two new engineering geologists, as do several of the faculty for putting in all of the hard work necessary to get their professional registration. In the shorter term, we are in debt to Gerhard Pratt and Jean Hutchinson for coordinating the Departmental submission to the CEAB. This outstanding result is welcome recognition of the excellence of our undergraduate offerings in geological engineering!!

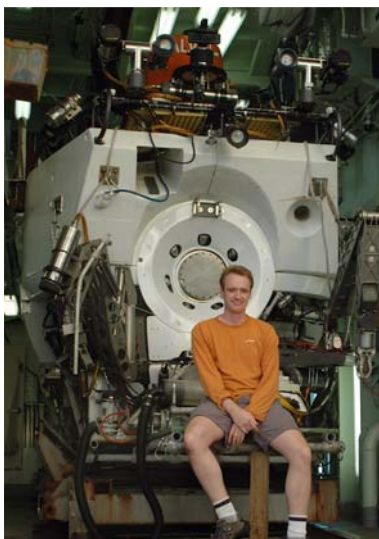
SOME STATISTICS: Our database indicates that more than 2500 people have graduated from the Department over its history. Of this number, we have active e-mail addresses for 36%. This limits our ability to provide you with timely information about alumni events. Please contact us and give us a your address! More importantly, only about one in ten of our alumni have given back to the Department. Any donation helps! Please give.

New Faculty Member

It is with great pleasure that I welcome **Daniel Layton-Matthews** to the Department. Dan comes to us from a post-doctoral fellowship that he held jointly at the Center for Ore Deposits Research, University of Tasmania, and the Geological Survey of Canada. He obtained his M.Sc. at Laurentian University where he worked on metamorphosed ultramafic-mafic intrusions in the Thomson Nickel Belt of northern Manitoba, and recently received his Ph.D. from the University of Toronto where he examined the origin of selenium in several volcanic-hosted massive sulfide deposits in the Yukon. He's filling the "petrologist" position that has been open for some time, and also adds depth and breadth to our expertise in mineral-deposits geology. Find out more about his research in the Research Reports later in this newsletter. Welcome Dan! Glad to have you on board.



D a n L a y t o n - M a t t h e w s, our newest professor, on Easter Island (above) and with the Alvin research submarine (below), which he used during Ph.D. studies at the University of Toronto, to investigate the origin of volcanically hosted massive sulfide deposits in the South Pacific Ocean.



Kurt Kyser Wins Multiple Honours

Professor **Kurt Kyser** has received two significant honours for his research work in the last few months. The first was receipt of the **Willet G. Miller Medal** from the Royal Society of Canada, which is awarded for "outstanding research in any branch of the earth sciences". His receipt of this award is particularly fitting as it is named for the same geoscientist after whom Miller Hall derives its name. This medal, which is given every two years, was first given to Norman Bowen. Other Queen's recipients are James Hawley and Leonard Berry.

More recently, Kurt has been awarded a **Killam Research Fellowship** by the Natural Sciences and Engineering Research Council of Canada (NSERC). Each year, 10 such awards are given to prominent researchers in any field of research from the humanities, through the natural and health sciences to engineering. They provide for two years of release time from teaching, so that the recipient can concentrate on his or her research. Kurt will continue his multi-faceted work on tracing the migration of elements through the earth's near-surface environment, work that has application to issues as diverse as mineral exploration and environmental problems.



Kurt Kyser in his state-of-the-art isotope laboratory, the Queen's Facility for Isotope Research (QFIR).

Vicki Remenda Appointed to a Chair in Teaching and Learning

Professor **Vicki Remenda** has recently been named as the second-ever Queen's Chair in Teaching and Learning. During her tenure in this Chair, she will work to promote the use of research as a teaching tool for undergraduate students. Her proposal recognizes that students become most engaged in their education when they are actively involved in the discovery process and learn much more deeply than in the traditional classroom setting where they are passive recipients of information. The Queen's Chairs in Teaching and Learning are the University's way of demonstrating its commitment to improving undergraduate education, and are a parallel series to the prestigious Queen's Research Chairs, three of which are currently held by Profs. Noel James, Kurt Kyser and Guy Narbonne. It is perhaps fitting that a geology professor should receive this high recognition, given that our programs have traditionally been much more hands-on than those in many other disciplines.



Vicki Remenda wants to get undergraduate students engaged in research and is cohosting the first-ever Inquiry@Queen's research conference in March, 2007. It is a chance for undergraduate students to showcase their research.



The Queen's Geology pumpkin, as displayed at the recent North Vancouver reunion.

First W.A. Gorman Teaching-Assistant Award Presented

As announced in previous communications, the Department instituted the W.A. Gorman Teaching Award in 2006, to recognize Al Gorman's 50+ years of contributions to undergraduate teaching. The award is intended to celebrate the invaluable service that our graduate students do as Teaching Assistants (TAs).

Three graduate Teaching Assistants (TAs) were nominated by the students, **Steve Beyer**, **Aitor Ichaso** and **Jingyang Zhao**, all PhD students. The student testimonials for all three were outstanding, each being praised for his dedication to ensuring that the students understood the material being taught. The ultimate winner was Steve Beyer, who received special praise from the students for his dedication to students and his extraordinary efforts to explain things. Steve received a framed certificate and a gift certificate for \$100 for purchases at the Campus Bookstore. The Department is very thankful for the dedicated efforts of all of our TAs.



Award-winning Teaching Assistant, Steve Beyer (centre) with Al Gorman (left), after whom the award is named, and Department Head Bob Dalrymple (right).

Colin Thomson Departs Queen's

Geophysics Professor Colin Thomson, who has been on a two-year unpaid leave of absence from the Department to work at Schlumberger's research centre in Cambridge, England, has recently handed in his formal resignation from the Department, in order to continue his work there. Colin has been an extremely valued member of the Department since 1986, and will be sorely missed. We wish him well in all of this future endeavors! We hope to begin a search for a replacement soon.

OTHER AWARDS AND HONOURS

Professor **Ron Peterson** and Departmental Technician, **Al Grant**, received the "Best Paper" award at the recent meeting of the Mineralogical Association of Canada meeting for their "simple and elegant" paper on humidity-controlled transformations in secondary sulfate minerals that occur in mine waste. The award is given for the best paper to appear in the 2005 issue of the international journal *Canadian Mineralogist*.

Former Queen's Geology professor and oil-industry entrepreneur extra-ordinaire, **Dr. Grant Bartlett**, received the Johnson Award last year. This award is given by the Calgary Branch of the Queen's Alumni Association to pay tribute to lifetime contributions to Queen's University, the Alumni Association and the Calgary community. The award recognized, in part, his former involvement with the Calgary Flames hockey team and his many philanthropic activities in Calgary. He is also a generous supporter of our Departmental Field Studies Program. Congratulations Grant!!

Uncle Al Gorman was one of two individuals given "Emeritus Duffer" status recently. This was given good heartedly to recognize his more than 25 years of playing Duffer's Hockey (a group of professors) on Friday afternoons. Al continues to sparkle on the ice, having scored four goals in the first four games of the 2006-2007 season!

Department Head **Bob Dalrymple** assumed the Presidency of SEPM (Society for Sedimentary Geology) at the organization's spring, 2006, meeting. At the same meeting, he received the "Best Oral Presentation" award for his paper (with Post-doctoral Fellow, **Don Cummings**) on the dispersal of mud from river mouths.

Emeritus Professor **Ian Nichol** (see more elsewhere in this Newsletter) received Honorary Membership from the Society of Environmental Geochemists at its meeting in Perth last year. His role as one of the early exponents of exploration geochemistry and in the training of many of the leading specialists in the field were specifically noted.

Emeritus Professor, **Tom Pearce** received First Prize at the October, 2005, meeting of the Canadian Surgery Forum for his paper on the use of laser fluorescence to image breast-cancer tumors. This highly unusual application of a geological technique shows the innovative applications that are possible. Professor

Gerhard Pratt is also venturing into the medical field, investigating ways to use his seismic-processing techniques for diagnostic imaging.

Marc Laflamme, PhD student in the Department, has received the Christopher Knapper Award for Excellence of Teaching. It is given by the University to TAs who have shown an outstanding commitment to their roles in education students. Congratulations Marc!

Jennifer Anderson, PhD student (supervisor Prof. **Ron Peterson**), received First Prize in the Remick Poster Competition at this past spring's meeting of the Geological Association of Canada and the Mineralogical Association of Canada. Her poster examined the equilibria of sulphate minerals in the (Mg, Fe, Zn) SO₄-H₂O system as a function of humidity.

Todd Noble, M.Sc. student, was awarded the 2005 Jack Henderson Prize for the Best M.Sc. thesis in structural geology by the Structural Geology and Tectonic Division of the Geological Association of Canada. His supervisor was Associate Vice Principle and Professor **John Dixon**. The title of the thesis was "*Structural evolution and imaging of fold-thrust structures in analogue models deformed in a large geotechnical centrifuge*".

Frances Mitchell, M.Sc. student, received the "Best Poster" award at the 2006 Meeting of the Eastern Section of the Seismological Society of America. Her poster was entitled "*Multiple brittle deformation events recorded along Grenvillian shear zones: implications for seismic risk*" and was coauthored by professors **Laurent Godin** and **Gema Olivo**.

Emily Bamforth, M.Sc. student under the supervision of Prof. Guy Narbonne, was runner up for the Thomas E. Bolton Award for the best student presentation at the Canadian Paleontology Conference held in Montreal recently. Her talk was entitled "*Pectinates: A multi-branched rangeomorph from the Ediacaran of Newfoundland*".

For up-to-the-minute information about Departmental events, breaking news stories, copies of previous newsletters and more, visit the Departmental website at

<http://www.geol.queensu.ca/>

RECENT EVENTS

Recent Advances in Earth Science Conference

The graduate students in the Department, headed by PhD student **Marc Laflamme**, organized the 5th annual Recent Advances in Earth Science Conference this past spring AESRC.

This is the first time that this conference was held at Queen's University. AESRC gathered earth scientists from several prominent Canadian and American universities and allowed for inter-university communication and collaboration between students. Four topical sessions (Sedimentology, Environmental studies, Tectonics, and Geotech) allowed for a unique interaction between faculty, graduate students, and undergraduate students. Multidisciplinary keynote addresses by Drs. Heather Jamieson, Kurt Kyser, Laurent Godin, and Jean Hutchinson introduced delegates to the environmental impact of mine waste, the geochemistry involved with the production of in-situ dolomite, innovative perspectives on the formation of the Himalayan Mountains, and geotechnical aspects of studying landslides, while a lunchtime guest lecture by Dr. Bruce Hart of McGill, as part of the CSPG special lecture tour, brought new perspectives to the search for petroleum reservoirs. Over 40 student delegates presented their research, with Larry Mackey (Queen's U.), and Mark D. Smith (Ottawa U.) winning the CSPG student awards for best overall poster and oral presentation respectively. In addition, Sarah Hirschorn (U. of Toronto), Martha Mussa-Caleca

(Queen's U.), Ramon Gonzalez-Mieres (Princeton), and Kathy Kalenchuk (Queen's U.) were awarded best presentation for their respective fields. The overwhelming success of the conference would not have been possible without the generous donations of our sponsors: Esso Imperial Oil, Canadian Society of (AESRC) Petroleum Geologists, Water and Earth Science Associates Ltd (WESA), Nexen Inc., Ottawa Carleton Geosciences Centre, Malroz Environmental Sciences & Engineers, Geostatic, O'Connor Associates, and the Canadian Geosciences Council. –

Prepared by Marc Laflamme and Suzanne Boyle.

Homecoming

The Department held an Open House as part of Homecoming on the weekend of September 16, 2006. Attendance was perhaps not as good as some previous years, but we were pleased to see a number of graduates from 1946 and 1956 (60 and 50-year reunions respectively), as well as several more recent graduates. It's always a pleasure to learn what people are doing. Plan to come next year.

Calgary Reunion

On Saturday, September 30, Greg and Sonny Milne hosted the 4th Annual Queen's Geology Reunion in Calgary. More than 50 people attended, with alumni spanning a wide range of years, from the 1950s into the 2000s. As usual, there was a delicious set of munchies to satisfy people's hunger for food. Lively conversation satisfied their hunger to hear what other alumni were doing. Al Gorman, Noel James and Bob



Attendees at the 1st-annual Victoria reunion.

Dalrymple represented the Department. It was a fun evening that was enjoyed thoroughly by all in attendance. **Watch for the next reunion in the fall of 2007!**

Victoria and Vancouver Reunions

Saturday, October 28th, 2006, was a special day on the Canadian west coast, because that was the day that our alumni hosted two (!!) reunions in back-to-back succession. The first was a Brunch gathering that was held at the home of Jane Wynne and Mike Fecteau in Sydney, BC, beginning at 10:30 am. The number in

attendance was small, but everyone had a wonderful time. The second reunion was held at the home of Dawn Russell and Colin Joudrie, in North Vancouver, beginning at 7:00 pm. The number in attendance did not quite reach the number participating in the Calgary reunion, but the level of enthusiasm, as judged by the loudness of the conversations, was perhaps one of the highest I've seen. Everyone had a thoroughly enjoyable time. The Department extends its sincere thanks to Jane, Mike, Dawn and Colin for the tremendous effort that they have made on behalf of our alumni. **We look forward to the second annual west-coast reunions next year!**



Attendees at the 4th-annual Geology reunion in Calgary.



Attendees at the 1st-annual Vancouver reunion.

ADVANCEMENT NEWS

Ian Nichol Exploration Geochemistry Fund Established

Emeritus Professor Ian Nichol was one of the pioneers in the application of geochemical techniques to the exploration for mineral deposits, and over the course of his 26-year career as a Professor at Queen's (1969-1995) he trained many of the subsequent leaders in the field of exploration geochemistry. This tradition of research and teaching of exploration geochemistry continues at Queen's, through the ongoing efforts of Kurt Kyser (see the article by Kurt Kyser in the *Research News* section below).

In order to assist the Department in its teaching of exploration geochemistry, Ian has given the Department \$100,000 to create the Ian Nichol Exploration Geochemistry Fund. This fund is specifically intended to provide students with the ability to undertake field trips to see classic localities where particular challenges face the exploration geochemist. In addition, the fund will allow students to undertake their own orientation survey, from survey design, through sample collection and analysis, to data analysis and presentation. This represents a significant enhancement of the larger push to incorporate field studies in all of our teaching activities. THANK YOU Ian!!! Your generosity is an enormous benefit to the Department.

In order for this endowed fund to be fully self sustaining into the future, we must augment it with an additional \$100,000-\$200,000. We are hoping that individuals and companies with an interest in exploration geochemistry will see fit to contribute. If this is something that might be of interest to you or your company, please contact Bob Dalrymple at:

E-mail dalrymple@geol.queensu.ca or

Phone 613-533-6186

Field Studies Program Endowment Fund Growing Fast

As we've told you in previous Newsletters, the Department has made the enhancement of its field-studies program (field trips and field schools) a priority for its fund-raising activities, because we believe that a good geological or geophysics education demands that students be exposed to the "real world" as much as possible. To allow the Department to have a sustainable field-studies program that is the

envy of other departments, we have set a goal of raising a \$2M endowment that will allow us to expand and improve our suite of field trips and schools, without burdening the students with excessive costs for transportation, accommodation and food.

I am extremely pleased to report that we have, to date, received donations and pledges totaling more than \$600,000 toward our objective! Some of the donations are large, such as Ian Nichol's pledge described above, but many of the donations are smaller. Regardless of the amount, we are extremely grateful for the support that our alumni and friends have given. Each donation, no matter how small or large, is a vote of confidence in what we're doing. This is an excellent way for graduates to "give back" in recognition of the benefit that they received during their time here. Please be generous and help us reach our target!!

"Thank You" to our Generous Benefactors

The 2005-2006 period has been an outstanding time for donations to the Department, with significant amounts given or pledged, most of it to our Field Studies Endowment Fund (see above). At this time when we can no longer count on governments to do everything for us, we are forced to turn to our alumni to help us do those things for our students that we could not do otherwise. Alumni must begin to act more like those in the United States where "*Giving Back*" is a way of life.

The following alumni have done just that over the twelve-month period from September, 2005 to December, 2006. Their generosity is helping us train a new generation of students.

Albon, Sheila BSc '79; Allard, Gilles MA '53; Allen, James BSc '49; Anadarko Canada Corporation; Arc Financial Corp.; Ardies, George MSc '99; Austin, Jeff BSc '79; Balkwill, Hugh BSc '58; Barclay, William BSc '85; Barnes, William BSc '60; Barrick Gold Corp; Beattie, Angela BSc '01; Birch, Michael BSc '74; Blyth, Donald BSc '90, MBA '93; Bogden, Gordon & Gillian BSc '81; Burgess, Jennifer BSc '92; Butler, Karl & Rebecca Mills BSc '87; Campbell, Finley MA '56; Chown, Edward BSc '55; Closs, Graham PhD '73; Coleman, Leslie & Helen BA '50, MA '52; Collins, Jon MSc '71, PhD '75; Cooper, Gordon BSc '59; Corrigan, Catherine BA '91, BSc '94, MSc '98; Davies, Bruce & Lila BSc '73; Delves, David BSc '91; Dent, Walter BSc '45; Dilworth, James & Janis; Dixon, John; Doggett, Michael MSc '87, PhD '94; Donkers, Justina BSc '79; Douglas, Heather BSc '89; Dufresne, Marcel BA '73, BED '74; Eade, Mary BA '58; Ebbert, Thomas BSc '82; Falconbridge Limited; Fallas, Karen BSc '94; Ferre, Leslie Ann BSc '94; Fraser, Ryan BSc '98; Gardner, Douglas PhD '77; Gray, Michael BSc '60; Green, Margaret BA '30; Green, Peter & Kitty BA '57;

Harrington, Robert BSc '71; Helmstaedt, Herwart; Herron, Ellen BSc '64; Hitchon, Charles BA '79; Hriskevich, Michael BSc '47, MSc '49; Hudson, Brian BSc '73; Hughes, Jane BA '82, BSc '85; Imperial Oil Resources; Inco Ltd.; Inmet Mining Corp.; James, Noel & Judith; Jenness, Stuart BSc '48; Jones, Peter BSc '74; Kisilevsky, David BSc '94, MSc '98; Lamb'Fauquier, Erin BSc '00; Langridge, Robert BSc '78; Lund, Neil, BSc '47, MSc '49; Mace, Heather BSc '93, BED '94; Martin, Douglas BSc '60; Martindale, William; Matthews, Stephen BSc '75; Maxwell, Robert BSc '74; McPhedran, Deborah BSc '90; Medwedeff, Donald MSc '83; Milne, Gregg BSc '71; Milne, John & Wanda BSc '71; Milne, Richard BA '54, MD '58; Montgomery, Allan MSc '03; Montgomery, Kevin BSc '84; Moser, Desmond & Katrina BSc '86, BED '91; Muir, Thomas BSc '72, MSc '76; Nathwani, Meera BSc '95; Nichol, Ian MA '58; Nichols, Robert BSc '71; O'Connor, Michael BSc '68 PhD '76, DSC '92; Park, Robert BA '70, BSc '71; Peeling, Gordon & Burns, Katherine BA '72; Petch, Christine MSc '95; Petro Canada; Podetz, Christopher BSc '97; Price, Raymond; Pugh, Kirsten BSc '02; Reid, Gregory BSc '83; Reid, Pamela BSc '72; Robertson, Jane BSc '84; Roeder, Peter; Roscoe, William BSc '66; Rose, Steven BSc '81; Sauve, Pierre MSc '54; Scoates, Jon & Mary BSc '61; SGS Lakefield Research Ltd; Shaw, Elizabeth BSc '61; Shewan, Wanda BSc '74; Simmons, Donald BSc '00; Smith, Anna BSc '81; Smith, Graham BSc '94; Smith, Leigh; Smith, Roger BSc '71, MSc '78; Speidel, Friedrich MSc '88; Stewart, Michael BSc '73; Stiebel, Bill BSc '75; Teck Cominco Ltd.; Thorpe, Ralph MSc '63; Trimble, Richard BSc '75, MSc '78; VanDine, Douglas BSc '72, MSc '75; van Nostrand, Innes & Alison Holt BSc '90; Waldron, William BA '70; Werniuk, Jane BSc '77; Williams, Andrew BSc '90; Williamson, Andrew BSc '85; Wright, Michelle BSc '95, MSc '96; Wynne, Jane, BSc '77; Zalnieriunas, Rimant BSc '78; Zhou, Xiaodong MSc '94.

THANK YOU, each and every one of you!!! If others would like to donate, please contact Queen's Advancement, any member of the Geology Council in Calgary, or Bob Dalrymple, Head of Department. Donations can be in any form, including direct contributions, annual pledges, gifts of securities, or naming of Queen's Geology in a will. **Your gift helps!! Please give! Our students thank you!**



**Your gift helps!!
Please give!**

Our students thank you!

RESEARCH NEWS

The Department has traditionally had a strong, international reputation in mineral-deposits geology, with a major focus of its research and teaching efforts (at both the undergraduate and graduate levels) being directed toward providing the ideas and people that will be needed by the mineral industry. This tradition is being carried on. The arrival of Dan Layton-Matthews as a new, tenure-track Assistant Professor, adds to the world-class strength that we have in this area. The following research reports that were prepared by the members of our mineral-deposits team highlight the depth and diversity of ongoing research in this field, as well as the collaborative nature of the interaction between researchers.

Kurt Kyser and the Queen's Facility for Isotopic Research

Ore deposits represent natural aberrations in element distributions. As such, their origins must be studied in a larger context relative to normal background distributions. In addition, they are continually "leaking" elements into their surrounding environment. Our research group in mineral-deposits geology is focused on trying to understand which fluids concentrate metals into ores and the processes by which the ores leak elements into the near-surface environment.

Kurt Kyser and his colleagues take a holistic approach that examines the fluid history of various environments that produce ores, particularly uranium, lead-zinc and copper deposits hosted in Proterozoic sedimentary basins in Canada (the Athabasca, Otish, Thelon and Hornby Bay Groups) and Australia (McArthur and Isa basins) and those that produce the clan of deposits associated with copper, gold and uranium in association with iron oxides (IOCGs) in Chile (Mantoverde) and Peru (Marcona, Mina Justa). Additional areas of the world that Kurt's groups is involved include Finland, Russia, Guyana and Gabon, particularly in research related to uranium mineralization.



Kurt also has an active research program in exploration geochemistry focusing on finding elements that reflect uranium, nickel and copper deposits in Canada and Chile that are buried under overburden or younger deposits. His approach is to integrate geological and geophysical data with the geochemistry, particularly the isotopes of several elements, to trace fluids and sources of ores and to use these techniques to sense deposits at depth. Using isotopes as tracers of ore-derived elements, he and his students have

developed novel sampling media and techniques for exploration, including the use of vegetation (e.g., tree-rings) as temporal records, real-time leaching of soils and clay minerals that reveals where in a sample specific elements are held, and the detection of elements mobilized from deposits by microbes.



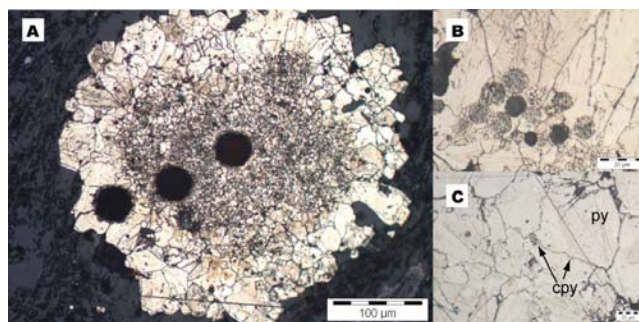
This research effort involves Cameco Corp., Anglo American and their partners as major collaborators, as well as Alan Clark, Gema Olivo and Dan Layton-Matthews of this Department. To accomplish this research, the group has designed and constructed a consortium of analytical instruments that are part of the Queen's Facility for Isotope Research (QFIR), a facility dedicated to promoting the use of isotope tracing in ore-deposits research as well as many other disciplines.

Ancient and Modern, Seafloor Volcanogenic Massive-Sulfide (VMS) Deposits

As noted above, Dan Layton-Matthews is our newest faculty member. His past research activities have involved the genetic modeling of ore deposits that include Volcanogenic Massive Sulfide (VMS), magmatic Ni-Cu-PGE and epithermal Au systems. Dan's most recent work involves studying the influences of hydrothermal ore fluids on regional coeval black shale in the Mount Read (Tasmania) VMS district. Graphitic shales and argillites are ubiquitous features of submarine volcanic successions and commonly lie below and above many VMS deposits. These rocks should contain information on the sedimentary and hydrothermal fluids active during the formation of VMS mineralization. Numerous researchers have studied pyrite separates for anomalous isotopic and geochemical signatures over the past 50 years as vectors to VMS mineralization, but have had mixed results. While examining individual pyrite grains from graphitic argillites from the Mount Read VMS district by acid etching, laser ablation ICP-MS, and laser ablation stable isotope ratio analysis, Dan has found that these grains contain a complex depositional history that texturally and chemically record a protracted (~100 Ma) basinal and hydrothermal history that can be correlated over ~400 km³. Additionally, Dan has

found that the occurrence of small base-metal sulfide inclusions in the cores of these complex pyrite grains correlate positively with proximity to the Hellyer VMS deposit.

Dan is currently involved in the Deep Search Project of the Targeted Geoscience Initiative III program in collaboration with the Geological Survey of Canada. The goal of this study is to develop and test new and improved methods of detecting base-metal deposits concealed below unconsolidated surficial deposits or buried at depth in the Earth's crust, with the aim of discovering new ore reserves and sustaining the life of base-metal mining communities across Canada. Dan is investigating along-strike isotopic (e.g., S, Fe, Cu, Zn, Mo, Se) variations and their potential as vectors toward mineralization in the Kidd-Munro assemblage, Abitibi belt, Ontario, and the Hackett River Greenstone Belt, Nunavut. Stay tuned for more results.



A) Complex pyrite growth with the Que River Shale, Tasmania. The black circles are laser ablation pits created during ICP-MS analysis of pyrite composition. B) Primary framboidal pyrite in the core of a larger pyrite grain. C) Chalcopyrite inclusions along the margins of annealed pyrite cores found adjacent to the Hellyer VMS ore body.

The Central Andean Metallogenic Project

Alan Clark's research, much of it in cooperation with Kurt Kyser and Jim Lee, focuses on gaining a better understanding of the processes that generate base- and precious-metal ore deposits in the subaerial volcano-plutonic arcs above subduction zones. The long-lived, still-active and exceptionally well exposed Central Andean orogen, an unmatched "field laboratory", hosts a large number of world-class porphyry copper, polymetallic skarn, epithermal gold-silver, tin and tungsten vein, and iron oxide-copper-gold deposits, all prime targets for exploration by major and minor Canadian companies. His research is prompting radical reassessment of traditional ore-genetic models for those magmatic-hydrothermal systems, emphasizing the local and regional environments which promote both giantism and exceptional grades.

Aerial view of the southern extremity of the behemothian Mio-Pliocene Rio Blanco/Los Bronces porphyry Cu-Mo cluster, central Chile, showing the Sur-Sur open pit.



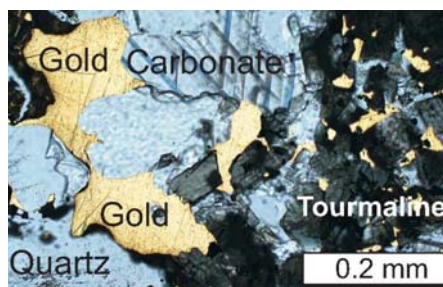
Unlike most other Andean research programmes, the Queen's University Central Andean Metallogenetic Project (CAMP) has, since 1967, embraced all aspects of Andean geoscience, including even geomorphology, a critical control on both the upgrading of ores through weathering and, less predictably, the location and intensity of primary mineralization in the shallow crust. Of particular interest is the demonstration, through light stable isotope analysis, that bacteria play a key rôle at all stages of supergene activity, a finding that shows that they are true ore-formation agents.

The Source of Gold in Vein Systems

Gold... Everybody likes gold, and especially **Gema Olivo**, whose research focuses on the genesis of gold deposits. In order to try to uncover the secrets of how vein-type gold deposits form, she has examined deposits of a wide range of ages. Her team has concentrated on developing an understanding of the sources of the gold and of the fluids that transport and precipitate the gold, in order to provide guidelines for exploration.

Her study of the gold deposits hosted in Archean greenstone belts has demonstrated that the gold-bearing vein system formed after regional metamorphism was replaced by fluids that were hotter and more enriched in carbonic dioxide than those responsible for the syn-metamorphic auriferous veins. Significantly, the lead-isotopic data suggest that melting of the middle crust and the generation of sedimentary-derived granites may have played an important role in the remobilization of gold and its emplacement in the upper crust. This finding has important implications for understanding the thermal evolution of the Archean crust and of fluid flow in it.

(Right) Photomicrograph showing gold and associated minerals from a gold vein of the Sigma Mine, Val d'Or, Quebec.



Her ground-breaking research on the evolution of sulphide minerals during metamorphism of the Mesozoic Otago Schists in New Zealand identified the major sources of the elements that are found in the gold veins. Her work showed that the pyrite, galena, sphalerite and cobaltite found in the low-grade metamorphic rocks are the main hosts for the elements that are enriched in the gold veins. During prograde (rising-temperature) metamorphism, these sulphide minerals are consumed, releasing metals that were then transported by metamorphic fluids to the sites where they precipitated to form economic gold deposits.

New research is examining where gold and associated metals sit in the crystal structure of pyrite, in order to develop better exploration strategies and more efficient means of extracting the gold during mineral processing.



The **Betze-Post open-pit copper mine in Nevada**, where **Gema** has been working for the last three years with **Post-doctoral Fellow Annick Chouinard** and **Ph.D. student Carolina de Almeida**.

Copper Economics and Human Resources

During the past year, **Mike Doggett's** research has focused on two key areas – the economics of the global copper industry and the human-resources issues facing the exploration sector. With respect to copper, an ongoing CAMIRO-funded project is looking at the cost and scale structure of copper porphyry operations. This work is being done with Ph.D. candidate Susan Bird. Also in the copper industry, the costs, risks, and returns of exploration for economic copper deposits have been the focus of a study carried out jointly with Richard Leveille of Phelps Dodge Exploration. Findings were presented at the Society of Exploration Geologists (SEG) 2006 Conference on Wealth Creation in the Minerals Industry and published in SEG Special Publication 12. The findings show that over the past 25 years, the return to exploration in the copper industry has been marginal. The price volatility in the industry means that periods of exceptional earnings such as companies are experiencing at present are offset by major losses during the troughs in the cycle. A broader examination of the copper industry, considering changes in technologies, scale effects, and the impact of world-class deposits, formed the basis for more than 25 presentations to universities and industry groups during the past year under the guise of the SEG International Exchange

Lecturer. The major finding of this work is that the growth trend in primary copper supply cannot be sustained on the basis of continued increases in production rates at individual mines. Future growth will hinge on improved technologies for processing of copper ores.

Mike's other main area of research is the demographic issues facing the exploration industry. The current boom in the mining industry has highlighted the imbalance between impending retirements and the number of new graduates in the various sub-disciplines of geology and geological engineering. Initial stages of the research have highlighted the generally poor track record of exploration companies in training and succession planning. Some initial findings of this work were presented as a keynote presentation at the Society of Exploration Geophysicists annual conference in New Orleans and as an invited presentation at the Geological Society of America annual conference in Philadelphia, both in October 2006.

MILLER HALL REACHES 75

BY AL GORMAN

Seventy-five years ago (September, 1931), the Department of Geology and the Department of Mineralogy moved into



Miller Hall. These departments started out in Carruthers Hall in 1893 but, in 1900, moved to the newly completed Ontario Hall. This was the home of Geology and Mineralogy for over three decades but, in 1931, the move was made from dark Ontario to Miller Light. Four professors made the move, J.E. Hawley, Head of Mineralogy, Everend Bruce, Manley Baker, Head of Geology, and Bruce Rose. Also making the move were 13 undergraduates, of whom 9 were in engineering, and 13 Masters candidates, of whom 9 again were engineers.

By the time Miller reached 25 in 1956, J.E. Hawley was the Head of the recently formed Department of Geological Sciences. There were now seven professors, 36 undergraduates, 13 masters students, and 8 working on their Ph.D.'s. What was Miller Hall like 50 years ago? If my memory is not totally unreliable, I can give you an idea, mainly to show the great changes that have occurred. The basement was the McDonald floor: Graham McDonald ran the X-Ray unit, Bruce McDonald was the custodian of equipment, and Donald McDonald was a general worker. Most of the basement was given over to rock storage. The first floor was all Museum, with typical geological specimens like a mummy, a complete suit of armour, and a boomerang. The east end of the second floor was Room 201, where Fred Jolliffe enchanted first-

year engineers with tales of water dowsing and the wonders of geology. Lectures were at 8:00 am on Friday and Saturday mornings. The seats were numbered, each student had a designated seat, and Fred took attendance by jotting down the numbers he could see. Students going away for a weekend would hire another student to cover his number; the going rate was fifty cents. Room 201 still exists, but is smaller. In 1972, a wall was built to cut off the old lecture-bench area so that the room, which originally was over 1000 square feet in area and had only one route leading outside, would meet fire safety regulations. A new windowless office was created in what was once the original front fifth of the old lecture hall. The most easterly office was occupied by Jack Usher (now the home of Noel James). Next west on the Union Street side was the Petrology lab (now the offices of Alan Gorman and Jean Hutchison. Across the hall was a Geology 1 lab (Now the "Fourth Year Room"). Next west was the open stairwell (enclosed in 1972 to satisfy the fire marshal). Next west on the south side was the women's washroom, and across from it was Room 225, which has been a first-year lab for over 50 years. West of this lab was a corridor that led to the office of Manly Baker (now home for Sandra McBride), and a tiny closet that was the main office, occupied by Brenda Mitton. Across the corridor from this was a lecture room, 210, which is still in use, and a "Faculty Toilet" and Dr. Jolliffe's storage room, both of which disappeared with the advent of the Bruce Wing. There were two offices on the west end of the corridor, Mike Fitzpatrick on the south side, and Alan Gorman on the north. The west end of the second floor was the old "Fourth Year Room", now grad offices.

The third floor had a conference room at the east end, now a grad office. At the east end of the corridor were the offices of Jellify, Ambrose, and the tiny "Head's Office" on the south side, home of Dr. Hawley, where all 7 faculty squeezed in for afternoon tea. Dr. Hawley had a rather severe manner, and students sometimes referred to him as #11 (relating to the Moh's hardness scale). Farther west were labs, and on the north side, a lecture room, 322. Next on the south side was Len Berry's office, now occupied by Ron Peterson, and a grad office which disappeared when Bruce was added. Finally, there was the mineralogy lab, bigger than it is today, with preparation and storage rooms at its east end. I think one of the storage rooms is now the office of Gerhard Pratt. In those days, Mineralogy 2 was a full-year course, and compulsory for all students in geology, geological engineering, mining, metallurgy, engineering chemistry and chemical engineering. When blowpipe labs were running, the air in the third-floor corridor was blue-grey from the fumes of antimony, bismuth, arsenic, copper, lead, zinc, and sulphur, and you couldn't see the west end of the lab from the east end. The top floor is the easiest to describe, it was one large room given over entirely to first-year engineering drafting.

By the time of Miller Hall's fiftieth birthday, the Bruce Wing had been added, resulting in many changes. Two dozen profs looked after about 220 undergraduates and

60 graduate students, with 10 of them working on their Ph.D.'s. Rooms off the east corridor of the first floor of Miller, which had housed geography, were now first-year engineering labs. The largest area in the east end had been part of the Geology Library, but had become the large lecture room, 105. On the second floor, the old petrology lab had become faculty offices, and the Main Office had moved over to Bruce. Mike Fitzpatrick's office was now a storeroom, and a new washroom had been added. The old washroom beside the elevator was not in use and was eventually turned onto another office. The first occupant of this new office was a post-doc from India, who didn't like the word "Washroom" on his office door, so he covered it with his own name, "Khan". The room opposite the stairwell had been converted to grad offices. I'm not sure when the "Fourth Year Room" at the west end of the second floor was moved into the old first-year engineering lab next to the above-mentioned washroom, and its old home was converted to grad offices. On the third floor, there were fewer changes, a sort of grad-student hangout just east of the elevator had become Ed Farrar's dating lab, and Jolliffe's storeroom had become grad offices, as had the conference room at the east end. After drafting moved out of the top floor, the space was converted into more faculty offices and labs. At the west end of the corridor on the top floor, a passageway was built so that you could go *down* a flight of stairs to get from the *fourth* floor Miller to the *fifth* floor Bruce. A new washroom was installed off this passageway.

I wonder what Miller Hall will look like in 2031, in its 100th year! I have decided that I won't write up that history, but will leave that task to one of the new kids on the block. If you are visiting Kingston, take a stroll through the newly painted hallways of Miller, and look into the rooms where some of your profs tried desperately to fill your brain with all things geological, sometimes successfully.

ALUMNI UPDATE

By W.A. Gorman

I only get half the news I used to get in the nineties. How about everyone who graduated in a year ending in 2 or 7 (next year's Homecoming years) making the effort to spend two minutes sending me a brief note that lets classmates know where you are and what you're up to before the next Homecoming. Let me know If you want email address included in your item. WAG

1959

Ian Maycock, M.Sc., now owns a winter (?) home in Playas del Coco, Costa Rica. Semi-retired, he does a little consulting in the oil industry, but could be more active if something interesting came up.

1962

Rick Somerville, B.Sc., Hon., runs R. Somerville Geological & Mining Engineering Ltd. from Salt Spring Island, B.C. He consults on technical and/or management aspects

for the mining industry in the States, Australia, and Canada. His wife Chris has retired from UBC, where she taught Technical Writing, and now works on making Rick's reports readable. I guess I was not too effective in teaching Rick in GEOL 17 "Reports and Essays" course back in the Sixties.

1963

Jon M. Delorier, B.Sc., Hon., Retired from the Pacific Geoscience Centre about 15 years ago, and now grows orchids in Sidney. He served a term as President of the Victoria Society. His classmate, **Sandy Dodds**, B.Sc., Hon., sent in a note from Glen Osmond, South Australia, but included no news.

1965

Morland Smith, Ph.D., is now fully retired, and devotes his time to middle distance running, motorcycling, family research, and photography. His photo won the inaugural Queen's "Snap Judgements" competition (See Alumni Review, #4, p. 18)

1966

Rick Herzer, B.Sc., Hon., M.Sc., UBC, Ph.D., Victoria U., Wellington, New Zealand, suggests the present Geology Station Wagon is not as rickety as the '53 model used in the early '60's. Rick, we haven't had a wagon since the '70s. Rick spent much of his career at sea, in everything from small Japanese fishing boats to a "French restaurant with a 100 m ship built around it".

1968

Bruce Brown, B.Sc., Hon., Ph.D., Oxford, 1970, has been operating Brown Associates Ltd., in Toronto, an environmental company, for over 35 years. He manages the Lawyers Feed the Homeless program at Osgood Hall, and recently received a "Lord of the Fries" T-shirt on the occasion of cooking his 40,000th pound of McCains.

Bob Skinner, B.Sc., Ph.D., University of Washington, 1971, reports he is leaving Oxford and returning to Canada.

1970

Bruce Downing B.Sc., Hon., is president of MagPower, a firm producing a 250-watt fuel cell generator. If all the licensing agreements reported as pending in the February 11, 2005, Vancouver Sun were finalized, Bruce is a millionaire.

Dave Slessor, B.Sc., Hon., M.Sc., 1972, reports that he is now semi-retired from True Energy Trust.

1971

Manfred Kehlenbeck, Ph.D., retired in 2001 after 30 years at Lakehead University (12 years as Chair). Since retirement, he has made two "dream trips", to the Northwest Passage and Antarctica, so he now claims to be bipolar. He is involved in summer gardening and winter curling (which, he points out, has no slap shot). Also, he still keeps a hand in with matters geological.

1972

Harry Baker, B.Sc., Eng., M.Sc., Civil, 1976, and **Doug VanDine**, B.Sc., Eng., Civil, 1975, were inducted as Fellows of the Engineering Institute of Canada in March, 2006, for their contributions to the Canadian geotechnical and geoscience community. They served together on the Executive of the Canadian Foundation for Geotechnique,

a registered charity raising funds for the awards, prizes, and distinguished lecture series of the Canadian Geotechnical Society. Harry has spent 32 years working for the Institute for Research in Construction, National Research Council of Canada, in Ottawa. He is presently involved through his church in construction projects in Kenya and, after retiring in three years, is considering joining "Engineers without Borders". Doug had an outstanding but unfortunately brief career as our "geotech" professor, before moving to Victoria to found his own consulting firm. A leading figure in the geotechnical field in Canada, Doug received the Thomas Roy Award of the Canadian Geotechnical Society in 1998. He was an ardent sea kayaker, but he's getting old.

John Bowlby, B.Sc., Hon., M.Sc., 1976, has a new goal, recovering WW II aircraft from the Muskoka Lakes using magnetometers and side-scan sonar. The first targets are two trainers lost by Norwegian airmen training at Muskoka Airport. Later targets include a Catalina Flying Boat, a Norseman, and a Douglas (Dakota?). (The Catalina and Norseman were used in geological work in the Canadian North in the late Forties.)

Pam Reid, B.Sc., Hon., is an Associate Professor at the University of Miami. She spent last Fall on Highborne Cay, Bahamas, building a lab for the NSF Biocomplexity project studying modern marine stromatolites. The life of a geologist can be awfully tough.

1973

D. Scott Barclay B.Sc., Eng., M.Sc., Env. Eng., Guelph, 2000, went from Quebec City to Montebello to Calgary to Georgetown, Ont., where he has settled for 13 years. He continues to work for Dow Corning. A second daughter started at Queen's last Fall

Phil Reeves, B.Sc., Hon., is Executive Director of the Saskatchewan Mining Association Inc. He reports business is booming in potash and uranium, and starting up nicely in diamonds.

1974

Marcos Zentilli, Ph.D., after 33 years of teaching, has retired as Professor of economic geology and geochronology at Dalhousie, but still does research on the Canadian Arctic and the Andes of Chile. He also is still active as Director of the Fission Track Research Laboratory at Dalhousie.

1976

Debbie (Johnston) B.Sc., Hon., and **Bob Solc**, B.Sc., Eng. are respectively Exploration and Engineering Managers of Cheetah Oil and Gas Ltd., Calgary, which holds exploration licences in the recently active area of Papua New Guinea.

1978

Gary Gauthier, B.Sc., Eng., is now with Jabobs Engineering, working on the Fire Bag Three Project. He will be directing 60 employees by the time Christmas comes.

Judy Patterson, B.Sc., Hon., M.Sc., Ph.D., is an Associate Professor in the Geography Department at Concordia, which recently started an M.Sc. program in Human Interventions in the Environment.

Anne Poschmann, B.Sc., Eng., was elected Chair of the Consulting Engineers of Ontario last year. She is with Golder in Mississauga.

1982

Cynthia (Corbett) Visser, B.Sc., Hon., has retired from the oil industry after 17 1/2 years, to devote herself to parenthood. She mentioned her Homecoming year will be 2007, and wished more classmates would send in news. This gave me the idea for my introductory suggestion above. No, Cynthia, I did not organize the Aberdeen Street Homecoming Party.

1983

Don Medwedeff, M.Sc., Ph.D., Princeton, 1987, spent 12 years with ARCO Research in Dallas, and now 5 years with Chevron in the San Francisco area. Don and Betty have a son Billy, 13, and a daughter, 11.

Greg Reid, B.Sc., Eng., left the Golder Office in Kamloops to take a position with AMEC Earth and Environmental, also located in Kamloops. His first job was to evaluate a potential hydropower site. Turns out about 8 km of the valley side is a slide complex.

1984

Tom James, B.Sc., Hon., Ph.D. Princeton, 1991, after five years with the GSC in Ottawa moved to the Pacific Geoscience Centre in Victoria. He is involved in crustal deformation, sea-level changes, and glacio-isostasy. A trip to Antarctica was planned for last spring. He and his wife Fan Chen have two children, Oriana, 6, and Ethan, 2. Former classmates can contact him at tsjames@shaw.ca.

1985

Dave Baigent B.Sc., Eng., is Manager for Environmental Services for Southwestern Ontario, operating out of the Burlington Branch of Shaheen and Peaker Ltd. However, he will maintain an office at S&P in Toronto to provide environmental and geotechnical services for Toronto-area customers.

Mike Young, B.Sc., Hon., left Cazaly Resources in Floreat, West Australia, last December, and planned to take a couple of months off before looking for a new position. Perhaps an update soon?

1986

Jim Lee, B.Sc., Eng., Ph.D., Princeton, has been appointed Acting Associate Dean, Studies, Faculty of Arts And Science, for a one-year period.

1987

Megan Clark, Ph.D. In 2003, she became Vice President, BHP Billiton, and manager of their Technologies Group, which seeks to provide a competitive advantage for their business units.

Doug Grides, M.Sc., is Project Manager at B.C. Hydro and was working on the coal tar-contaminated soil at the site of a 1862 coal gasification plant in Victoria's inner harbour. Doug, Kelly and their two kids Owen, 3, and Georgia, 1, live in North Vancouver.

1990

Marcia MacLellan, B.Sc., Eng., to illustrate the flexibility of the Geology degree, graduated in Minex, and then made her career in geotechnique. She's at Klohn Crippen Berger of Calgary, working mainly on tailings dams around Fort McMurray. She hooked up with a UBC geology grad (yeah, I know) and they too bought a house in Calgary.

1991

Marty Burt, B.Sc., Hon., and Tracy live on a drumlin in North Gower, Ont. He is currently a manager at the Canadian Border Services Agency in Ottawa.

Jim Stimac, Ph.D., didn't get to Santa Rosa, as last reported. Instead, he and his family were diverted to Jakarta, Indonesia. His wife **Adrienne (Laroque)**, Ph.D., 1993), although a stay-at-home mom, co-authored a paper with Jim on Popocatepetl that was accepted for publication in a special issue of the Journal of Volcanology and Geo-thermal Research

1992

Martin Van Kranendonk, Ph.D., has been mapping the granite-greenstone terrain of the Pilbara Craton for over 10 years, first as a post-doc at the University of Newcastle, then with the Geological Survey of West Australia. He has also been involved in studies of early life. He still plays hockey once a week in Perth, despite his advanced years.

1993

Lisa Coyne, B.Sc., Eng., is with Golder in Mississauga, and reports she is lobbying to hire Queen's grads. A recent addition was Adam Melnyk, B.Sc., Eng., 2005.

1995

Jay Harrington, B.Sc., Hon., M.Sc., McGill, returned to Calgary from Denver, where he is a senior geologist with EnCana. He and Heather have a new son, William, who, Jay suggests, will take air photo from me in 2024. Jay kindly sent in lots of news about other grads, but (for privacy reasons) we can only use news supplied by the individual graduate. Thanks anyway, Jay.

Laura Neville, B.Sc., Eng., has been busy. She started in Ottawa, moved to Calgary for 6 years, back to Ottawa, where she reconnected with an old flame, **Robert Krog** (B.A., Geology and Economics, B.Sc., Eng., Mining, M.Sc., Mining, who has been working for BOISH (formerly the US Bureau of Mines)) in South Pittsburg for four years. Laura moved to Pittsburg in 2005, and found employment early this year. She and Robert are planning a wedding in November.

Jill Rutherford, B.Sc., Hon., B.Sc., Eng., 1998, left EnCana about two years ago to get into Real Estate. She married Andrew Hayden, and by now has added a baby to the 4 dogs in her household.

1996

Paul Buisseret, B.Sc., Hon., has started an M.D. program at the University of Colorado, but escapes west past the basalt-topped mesa at the Coors plant as often as possible to enjoy the Rockies.

1997

Jason Crowder, B.Sc., Eng., Ph.D., Toronto, 2004 (Civil Engineering), is finishing a post-doc under Willie Bawden (B.Sc., 1970, Queen's). He married Natascha Crispino (Arts, '97) in 2003. The wedding party featured three '97 GeoEng grads, Lawrence Arcand, Matt Boucher, and Chris Elvidge. (If everyone was as good as Jason at keeping in touch, we'd have a hundred page Newsletter).

Dave Hill, B.Sc., Eng., is with Adventus Remediation Technologies in Mississauga. He reports his wife Kim (Tilley; Arts, '97) gave birth to an 8 lb. 13 oz Alexander Douglas Hill last October 1.

Chris Podetz, B.Sc., Eng., joined EnCana late last year, under the supervision of **Blythe (Harding) Lowe**, B.Sc., Eng., 1987, working in the Plains Region. (Smart move, the Foothills are a "dejeuner des chiens"). He is now a condo owner, and presumably back from a perogie tour of Eastern Europe.

1998

Rob MacNaughton, Ph.D., is a Research Scientist with the GSC in Calgary. Now home-owners, he and Colleen have a larger area to chase Georgina, now two and a half.

Jenn (Corkery) Meleschuk, B.Sc., Eng., M.Sc., Queen's, Civil Engineering, 2004, married Sean in 2001, started working with the Ministry of Transport in 2002, and celebrated the arrival of Nora Isobel on July 12, 2005, while on leave from the MTO. She dropped by to introduce Nora last fall.

Chris Monro, B.Sc., Eng., M.Sc., 2003, is now working for the Ontario Ministry of the Environment as their Hydrogeologist for the Central Region's Technical Support Section. His previous experience was with Gartner Lee, Jaggar Hims and EBA Engineering. He is presently the representative for Ontario on the International Association of Hydrogeologists. He married Katharina Bulat on September 16, 2006, and they visited Queen's on their honeymoon.... Such spirit!! Congrats Chris!

2000

Kathy Dilworth, B.Sc., Hon., made a Christmas move from El Callao, Venezuela, to Perth, Australia. She also moved from exploration to mining, and is now with Barick Gold at the Plutonic Mine.

2002

Jennifer Anderson, M.Sc., won the GAC Remick Award at the Halifax meeting for her poster "Determination of Sulfate Mineral Equilibria as a Function of Relative Humidity: Intermediate Compositions in the (Mg,Fe,Zn)SO₄ System at 23 °C. Jenn is now finishing up her Ph.D. under the supervision of Ron Peterson.

2003

Natalie Bursztyn, B.Sc., Hon., M.Sc., 2005, is teaching Earth Science at Bakersfield College in the California desert. She reports a heavy downpour caused some classroom roofs to cave in last October. I suppose this gave her the chance to discuss infiltration capacity in porous media.

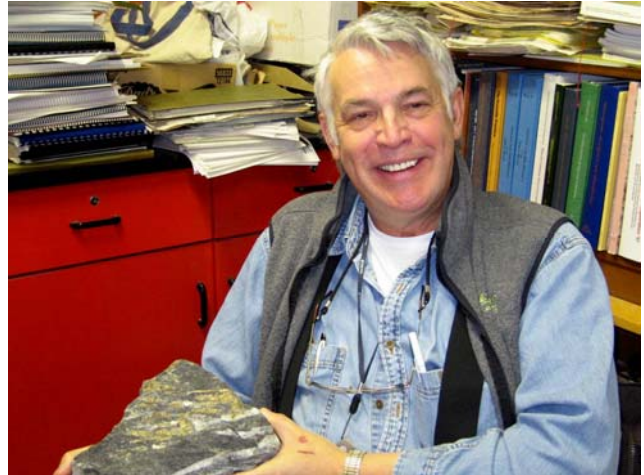
Scott Conley, B.Sc., Hon., left the Musselwhite Mine last spring, and moved to Shore Gold, working at their Star Diamond project in Northern Saskatchewan

Amy Kerchoff, B.Sc., Hon., last reported in April 5, 2006, so she has probably made 3 or 4 moves since then. From Alaska to Asia, to New Zealand, to South Africa, then back to New Zealand where she worked as a bartender to make enough money to pay for a commercial helicopter pilot's licence. At that time, her plans were 1) to get advanced helicopter ratings, 2) tour South Island, 3) look for a job in New Zealand, and then 4) come back to Canada to convert her NZ licence to a Canadian one. One website indicates she's back in Canada.

LATE-BREAKING NEWS

Howard Poulson Wins Duncan Derry Medal

Howard Poulson (Ph.D. 1985), who has been an Adjunct Professor in the Department for many years, teaching in our M.Sc. program in Mineral Exploration, has received the Duncan Derry Medal from the Mineral Deposits Division of the Geological Association of Canada. This is awarded annually to an outstanding economic geologist who has made significant contributions to the science of economic geology in Canada. For the full text of the citation and Howard's response, please see the July, 2006, issue of *The Gangee* (pages 17-19), which is available at <http://www.esd.mun.ca/~gac/SECTIONS/GANGUE/Gang90.pdf>. Way to go Howard! Well deserved!



Field Studies Program Receives Major Boost

At its very recent alumni gathering in Vancouver as part of the Roundup, the Department received a donation of \$200,000 from mining giant Teck Cominco, to be put toward the Field Studies Endowment Fund. Departmental alumni **Colin Joudrie** (B.Sc. 1991) and **Vicki Yehl (nee Bannister)** (M.Sc. 1996) were instrumental in securing this donation. In making the presentation Vicki said that: "This investment in the Field

School program at Queen's is an important contribution to ensure that one of the few intense field-studies program in Canada continues. This is one of the only places that young geoscientists and engineers are still learning the hands-on basic foundation blocks to building a successful career". We are honoured by Teck Cominco's vision. This donation brings the total in cash and pledges in the Field Studies Endowment Fund to approximately \$800,000.



Vicki Yehl presenting Teck Cominco's contribution to the Department's Field Studies Endowment Fund. Looking on are Professor Mike Doggett (left), Roger Smith (centre, Chair of the Queen's Geology Council in Calgary), and Jim Campbell (right, Queen's Advancement representative in Calgary).

Growing Martian Minerals in the Garage

Professor **Ron Peterson** may have solved the problem of the source of water that sculpted the Martian landscape. Using his garage as a research lab last winter, Ron grew a new hydrated magnesium salt ($\text{MgSO}_4 \cdot 11\text{H}_2\text{O}$) at temperatures below freezing. When this mineral melts, it forms epsomite plus significant amounts of water. It is hypothesized that the water released by this rapid transformation may be responsible for the channels, deltas and other water-sculpted features on the Martian surface. Links to additional news items and the original article can be found on the Departmental website <http://www.geol.queensu.ca/>.

Glaciation, Oxygen and the Appearance of Animals

Professor **Guy Narbonne** and several colleagues have used geochemical techniques to examine the level of oxygen in the world ocean in the latest part of the Precambrian. Their results, published recently in *Science*, show that oxygen levels before the last of the three "Snowball Earth" glaciations at ca. 575 my ago were too low to support animal life. Immediately after this glaci-

ation, however, oxygen levels rose to about 15% of present-day values, followed about 5 million years later by the appearance of the first members of the Ediacaran fauna (see articles in a previous issue of this newsletter). This finding helps to explain how animal life arose on Earth. For more information, visit <http://www.sciencemag.org/cgi/content/full/314/5805/1529>.

Upcoming Departmental Alumni Events

- Reception at the Prospectors and Developers Association (PDAC) meeting: Tuesday, March 6, 6:30-8:30 pm, Niagara Room, Intercontinental Hotel, Toronto
- Calgary Reunion: The 5th-annual Queen's Geology Reunion in Calgary will be held on the evening of Saturday, Sept. 29. Watch for more details.
- Homecoming: Oct. 12-14, 2007. The Department will have an Open House on Saturday morning, Oct. 13. As well, at least two graduating years are planning class reunions. More information will be provided as the time draws closer.



GEONEWS

WE NEED TO KNOW

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Wherever you are keep us updated on your activities and any changes in your contact information.

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