From the Chair

It’s been an active and exciting year in the department—I’m glad you’re able to find out through this year’s newsletter some of the excellent happenings here and catch up on the whereabouts and doings of our esteemed alumni. It is an honour for me to continue to serve as Chair of the department and work with Associate Chairs Professor Ed Spooner (Graduate) and Dr. Charly Bank (Undergraduate).

We have officially changed the name of the department to the Department of Earth Sciences. This represents part of the outcome of consolidation and expansion of geoscience research and teaching in the Faculty of Arts and Science at U of T to our department. It is the next phase in the evolution of the department which through its ~165 year history, has changed through an array of names (including Mineralogy and Geology; Geology and Paleontology; and Geological Sciences). With our change to Earth Sciences we welcome four new faculty members to the department: Professor Sharon Cowling, Professor Joe Desloges, Professor Miriam Diamond, and Professor Sarah Finkelstein. We are excited by the research and teaching expertise that each of these exceptional faculty members bring to the department. In particular, this represents a significant strengthening of our capacity in the fields of geomorphology/sedimentology, environmental science, geobiology and global change science, and you can read profiles on each of these new Earth Sciences professors within the newsletter. We anticipate a further expansion of geophysics research/teaching in the department with faculty transfer in this field in the near future. In addition, we are in the midst of a tenure stream search to fill a new position in crustal geology that will bolster the strength of our teaching and research in core geology sub-disciplines. With all these additions, the department is certainly in an active (and very welcome) phase of growth and development!

In addition to the faculty growth, we continue to see burgeoning undergraduate programs. Our classes and field camps at all years are bursting with students; in some cases we’ve had to double the number of lab sections to meet the demand. As one example, Ed Spooner’s fourth year Economic Mineral Deposits course was filled by 36 students this fall, with this limit only being set by the microscopes and samples we have available for a quality learning experience. Fundraising initiatives and internal funding have given our students more opportunities for field education. We were able to add a new “capstone” fourth-year geology field camp to our program—a two-week trip to Newfoundland led by Professor James Brenan. This is in addition to the various other field excursions that you will read about later in this newsletter. As a new initiative, we had a ceremony for our graduating students to receive their Earth Ring, a symbol of completing the academic requirements for future accreditation as Professional Geoscientists (for example, by the Association of Professional Geoscientists of Ontario) and a reminder of their professional commitments and responsibilities as geologists and geophysicists.

On the graduate side, we welcomed 20 new graduate students—the largest incoming cohort of grad students in many years. As I highlight every year, our
significant number of endowed internal scholarships and the external awards that our excellent cadre of students bring to the department allow us to maintain the highest quality of graduate research in the geosciences. Their accomplishments—from top-rate journal publications to award-winning conference presentations to acclaimed teaching contributions—are varied and numerous. In particular, we annually celebrate the special TA contributions of our exceptional graduate student teaching assistants with the Laurence Curtis Teaching Assistant Award. This year’s very deserving recipients were Rosie Oakes and Heidi Tomes.

On behalf of the department, I want to acknowledge all of our generous alumni and friends for their donations in support of Earth Sciences over the past year (see pg 12). The Emeritus Professor Steven D. Scott and Joan Scott Graduate Student Scholarship has an endowment of $149,500. This will create a permanent scholarship that we will award for the first time in September of this year. A new short-term matching funds program within the University has enabled us to establish two more graduate awards. The first is being funded by alumni, friends, and colleagues of Emeritus University Professor AJ (Tony) Naldrett in recognition of his outstanding professional achievements in teaching and research and also his service to the national and international community of Earth sciences. The second scholarship in this programme is being funded privately and details will be announced in due course. I also want to express sincere gratitude to a number of donors for their support of the Explorers Annual Fund for Field Education. There has been tremendous enthusiasm among students and faculty in the department for leveraging this financial assistance. Numerous field-learning opportunities, at all student levels, would not have been possible without donations made to this fund. As you will discover through the newsletter, these gifts really have made an immediate and tangible difference in allowing us to enhance the quality of the academic experience for our undergraduate and graduate students.

Finally, I want to thank Professor Emeritus Jeff Fawcett as Editor and Karyn Gorra as Assistant Editor for assembling this year’s newsletter. Somehow they manage to bring together all of the information, graphics, and news of the department and our alumni into one coherent professional document for us all to enjoy. Kudos to you, Jeff and Karyn! To you, the reader: enjoy your annual trip through the newsletter and as always, I hope to see and meet many of you at the annual departmental reception at the PDAC meeting.


Department News and Awards

ENI PRIZE TO BARBARA SHERWOOD LOLLAR

Barbara Sherwood Lollar, of the Department of Earth Sciences, University of Toronto, is the recipient of the 2012 Eni Award in Protection of the Environment for her work on compound-specific isotope analysis of volatile organic contaminants in groundwater. This prestigious award is presented for outstanding research and innovation in areas concerning the environmental impact of human activities, specifically the protection and restoration of the environment, with a special focus on research and innovative technologies to eliminate pollutants and to improve environmental conditions. The award, including a gold medal specially struck by the Italian Mint, was presented at the Quirinale Palace in Rome on June 15, 2012, by the President of Italy. The awards are chosen by a 24-member scientific review panel, and previous winners of the award include several Nobel Prize winners (see www.eni.com/eni-award/eng/home.shtml).

Eni, one of the world’s major multinational oil and gas companies, created the Eni Award in 1988 to develop better use of renewable energy, promote environmental research, and encourage new generations of researchers. The Eni Award, which is given annually, highlights the critical importance given by Eni in recent years to scientific research and issues of sustainability.

In October 2012, Barb received further recognition for her research programme. The Geological Society of America presented her with the 2012 Geobiology and Geomicrobiology Award for research on the deep biosphere.
A double-double of a different sort for emeritus faculty and alumni in Australia and New Zealand.

Emeritus University Professor Tony Naldrett received the Haddon Forrester King Medal from the Australian Academy of Sciences. This prestigious award recognises original and sustained contributions to Earth and related sciences of particular relevance to the discovery, evaluation and exploitation of mineral deposits. The award citation referred to his research that laid the groundwork for current understanding of the origins of magmatic nickel-copper and platinum group elements. He was also cited for his enormous contributions to the mineral industry through the training of undergraduate and graduate students at the University of Toronto who now occupy key positions in mineral exploration all around the world.

Readers will recall that Steve Scott was the 2011 recipient of this medal. The awarding of this medal to two members of the same department in successive years is unprecedented and signifies an outstanding international reputation for our department in mineral deposit geology.

The second leg of this down-under double-double concerns the New Zealand Prime Minister’s Award for science media and communications. The winner in 2010 was alumnus Dr. Cornel de Ronde (Ph.D. 1991) of GNS New Zealand and for 2011 alumnus Dr. Mark Quigley (B.Sc. 1999 UTM geology; Ph.D. Univ. Melbourne) of the University of Canterbury (NZ) was the recipient. Cornel’s work on the rediscovery of the Pink Terraces of Lake Rotomahana (once the Eighth Wonder of the World) received world-wide recognition in 2010 and Mark’s prize focused on his public activity following the devastating Canterbury earthquake. This $100,000 prize is given to a practicing scientist who is an effective communicator and will provide them with an opportunity to further develop their knowledge and capability in science media communication. $50,000 of the prize is to be used to support the recipient to carry out a programme of activities to further their understanding of media communication and $50,000 of the prize money is available to the recipient with no expectations on its use.

Congratulations to Professor Grant Ferris and alumnus Professor Mark Hannington (Ottawa University) on their election as Fellows of the Royal Society of Canada. Citations for these two inductees read as follows:

FERRIS, Fredrick Grant
The transformative work of Professor Grant Ferris, notable for its depth, breadth, interdisciplinary nature and fundamental role in defining the new discipline of microbial geochemistry, has made him one of the world’s premier scientists exploring problems at the interface between the biological and physical sciences. He has established a profound new understanding of the pervasive importance of microbial activity throughout Earth’s diverse environments, credited with the discovery and development of a range of novel contributions to his discipline.

HANNINGTON, Mark
Mark Hannington is an award-winning economic geologist whose research spans the exploration of mineral resources on the modern seafloor to ancient ore deposits in Canada’s major mining districts. His pioneering work on the geology and geochemical evolution of actively forming mineral deposits in the oceans has revised conventional ideas of ore genesis on land and strongly influenced mining exploration in Canada.

Rebecca Ghent was awarded tenure in 2012 and promoted to Associate Professor. She is currently on sabbatical at the Southwest Research Institute in Boulder, Colorado, working with Dr. Roger Phillips on the radar signatures of dust in the Martian polar caps and on problems related to lunar regolith development. She will also spend time during her leave working with planetary science colleagues in France and the UK.
David Giles received the PDAC’s Thayer Lindsey Award for 2012. This award recognizes an individual or a team of explorationists credited with a recent significant mineral discovery anywhere in the world. David received the award for heading Peñoles and Fresnillo plc exploration teams that have seen considerable success in the number of their new economic gold and silver deposit finds in Mexico and Latin America. Most notable of these was the discovery of a new vein system in the Fresnillo district, leading to the opening of the Saucito mine in 2011 and consolidating Fresnillo as the largest silver district in the world. Other principal finds included the San Julian silver-gold and Orisyvo gold deposits in Mexico, both now under development, and the discovery and geological reinterpretation of the Francisco I. Madero SEDEX deposit that led to the opening of an important new mine in 2002.

Dr. Alyson Thibodeau is the recipient of the inaugural Roger E. Deane Postdoctoral Fellowship, awarded by the Department of Earth Sciences at the University of Toronto. Alyson received both her M.S. and Ph.D. in Geosciences from the University of Arizona in 2006 and 2012, respectively. For her graduate research, she used radiogenic and stable isotopes to trace the geologic provenance of archaeological materials in the Southwest United States and in Mexico, especially turquoise. At the University of Toronto, Alyson is working with Professors Bridget Bergquist and Ed Spooner to study mercury isotopic signals preserved in the Proterozoic marine sedimentary rock record. Such measurements have the potential to provide new information about biogeochemical cycles of mercury on the early Earth, and may reveal new insights into the chemical evolution of the oceans and atmosphere.

Professor Andrew Miall will be inducted as an Honorary Member of the Canadian Society of Petroleum Geologists at their annual meeting in Calgary in May. The honorary memberships are given to “Earth scientists who have made outstanding contributions to petroleum geology on a national or international basis” and past recipients (since 1928) include some of Canada’s most eminent geoscientists.

Dr. Kim Tait – was promoted from Associate Curator of Mineralogy to Curator at the ROM She is cross-appointed (status only) as an Assistant Professor in our Department and plays an active role in both undergraduate teaching (GLG 206, Materials of the Earth) and in the graduate programme.

Dr. Long Li, a recent post-doctoral fellow with Barb Sherwood Lollar working on deep subsurface science, is a professor at University of Alberta.

Congratulations to Dr. Eric Grunsky (B.Sc. 1973; M.Sc 1978), who was awarded the 2012 Krumbein Medal by the International Association for Mathematical Geology (IAMG) for his long service to the IAMG community as a scientist, for his support of the Association and his service to the profession. The full citation by Dr Frits Agterberg can be seen at


but part of it reads:
“During his undergraduate years at the University of Toronto he developed a keen interest in the quantitative aspects of geosciences through the use of computers. His interest was encouraged by Professor Gordon Smith, who mentored Eric on the use of computers to solve a variety of quantitative problems. His M.Sc. thesis with Professors Fried Schwerdtner, Pierre Robin and Dick Bailey at the University of Toronto was one of the earlier studies in three-dimensional analysis of reconstructed tectonites by means of the integration of digital serial sections.”

Casey Hetman (B.Sc. 1993; M.Sc. 1996) played a key role in Northern Superior Resources Inc.’s Croteau Est Gold discovery in the Chapais, Chibougamau and Ouie-Bougoumou regions of Quebec. This work led to their being named 2012 “Prospector of the Year” by the Association L’Exploration Miniere du Quebec (AEMQ). Well done, Casey!

Dr. Martin Head took over as Chair of the ICS Subcommission on Quaternary Stratigraphy, during the 34th International Geological Congress in Brisbane, Australia last August. The appointment is initially for four years. The International Commission on Stratigraphy (ICS) is largely concerned with the development of the international geological time scale, and its constituent sub commissions are each responsible for the formal subdivision of their particular geological system. For the Phanerozoic and Ediacaran this involves the selection of a global boundary stratotype section and point (GSSP) to define each official boundary. A few years ago, Martin played an active role in defining the Quaternary System, which required the simultaneous lowering of the Pleistocene Series to 2.58 Ma (Gibbard et al., 2010a,b), and more recently was involved in the definition of the Calabrian Stage (at 1.80 Ma), which is the lowermost stage of the Lower Pleistocene (Cita et al., 2012).

Dr. Martin Head – was promoted from Associate Curator of Mineralogy to Curator at the ROM She is cross-appointed (status only) as an Assistant Professor in our Department and plays an active role in both undergraduate teaching (GLG 206, Materials of the Earth) and in the graduate programme.
Associate Professor **Sharon Cowling** completed her M.Sc. from the Department of Botany at the University of Toronto, with research focusing on leaf-level gas exchange responses to sub-ambient (glacial) atmospheric CO₂ levels. Her Ph.D. was from the Institute of Ecology at Lund University (Sweden), where research involved the use of ecophysiological-based vegetation models simulated under Last Glacial Maximum (LGM) palaeoclimate boundary layer conditions. Research interests remain in the palaeo realm; however, questions relating to vegetation form and function deeper in geological time are coming to the forefront. The following topics are currently under investigation by members of Cowling’s research team: (1) the role of biological soil crusts in facilitating evolution of plants onto land, (2) evidence of two carboxylating photosynthetic enzymes in early land plants, (3) the potential influence of the evolution of Poaceae (particularly bamboo, wild rice and C3 grasses) for the global silicon (Si) cycle during the Paleogene, and (4) fully-coupled General Circulation Model (GCM) simulations identifying potential biogepoEarth System Evolution.

**Professor Joseph R. Desloges**

My special interests are the influence of climate change and human disturbance on geomorphic processes and landform change with an emphasis on river floodplains and sediment yield in glaciated landscapes. Contemporary and Holocene glacier fluctuations have been reconstructed using terrestrial and high-resolution glaciolacustrine and glaciomarine sedimentary archives. I have conducted research mainly in large glacier-fed lakes of the western Canadian Cordillera and, in collaboration with colleagues at the University of Copenhagen, deep fiords of western Greenland. More recent work has focused on late Quaternary and Holocene fluvial environments of southern Ontario with particular emphasis on decoupling the influence of humans disturbance on erosion from that associated with climate-induced changes. Geophysical, geochronology and geoaheological methods have been used extensively to develop and interpret the sedimentary record. I teach courses in introductory geomorphology, advanced fluvial geomorphology and field methods. Prior to joining the University of Toronto, I was fortunate to undertake studies in geomorphology and Earth science at the University of Waterloo, University of Wisconsin-Madison and the University of British Columbia.

Professor **Miriam Diamond** joined the Department of Earth Sciences on July 1, 2012, after her affiliation with the Department of Geography and Planning since 1991. She is cross-appointed to the Department of Chemical Engineering and Applied Chemistry, the Dalla Lana School of Public Health, School of the Environment and Scarborough College’s Physical and Environmental Sciences Program. She received her B.Sc. in Biology from the University of Toronto (1976), M.Sc. from the University of Alberta in Zoology (1980), M.Sc.Eng from Queen’s University (Kingston Ontario) in Mining Engineering (1984), and her Ph.D. from the Department of Chemical Engineering and Applied Chemistry from University of Toronto (1990).

The goal of Miriam’s multidisciplinary research program is to improve our understanding of chemical contaminants from emission through to transport indoors and outdoors, and ultimately human and ecological exposure. Ultimately, we aim to influence policies, practice and perceptions through our scientific research. The methods used in her lab include environmental sampling, trace chemical analysis, and developing mathematical models that quantify chemical movement and exposure. The chemical contaminants of interest range from PCBs and organohalogen flame retardants to metals. This research has been published in over 100 articles and chapters in addition to receiving media attention. Miriam is an Associate Editor of the journal *Environmental Science and Technology* which is a leading journal in the field. She is a member of the Board of Directors of the Canadian Environmental Law Association and was, until recently, a member of the Science Advisory Board of the International...
Sarah Finkelstein, Associate Professor

Thanks to all for the warm welcome to Earth Sciences. I am looking forward to getting to know everyone, including alumni and friends of the Department. My research areas are paleoclimatology and paleoecology. I work primarily on Holocene lake sediment and peatland records, but have recently made a first foray into the Pleistocene in a new project on palynology of sub-till organic deposits in Northern Ontario. My expertise focuses on biological indicators of past climates and ecological dynamics, in particular pollen, and siliceous microfossils (diatoms). As a Ph.D. student of Tony Davis’ at U of T in Geography (PhD 2004), I spent a lot of time in the then Department of Geology studying diatoms in Marianne Douglas’s lab. It has been very satisfying to build upon U of T’s long legacy in paleoenvironmental science since joining the faculty in 2006. My recent research projects include Holocene paleoclimate reconstructions for the Eastern Canadian Arctic, paleolimnological analyses of recent changes in Nunavut lakes and ponds, and peatland development and carbon accumulation in the Hudson Bay Lowlands. It has been a great pleasure to work with many graduate students in the field and in the lab on these projects. My teaching activities include a field course in Quebec and a seminar in paleoclimatology.

Birthdays

Congratulations to Emeritus Professors John Gittins and Greg Anderson on celebrating their 80th birthdays in 2012.

The practice of sending congratulations on these occasions is time-honoured in our Department, as witnessed by the following letter sent by Professor AP Coleman to Professor WA Parks and refers to Coleman’s 80th birthday.

An even more senior birthday, a 90th, was celebrated quietly by Emeritus Professor Digger Gorman in 2012. Ill health has taken its toll and Dig now lives in the Veteran’s Wing at Sunnybrook Hospital. He welcomes visits from friends and alumni and enjoys talking to everyone.

Joint Commission of Canada. She is a Fellow of the Canadian Geographical Society and was named Canadian Environmental Scientist of the Year in 2007 by that society. She also served for many years as the Vice-Chair of the Planning and Budget Committee of Academic Board, is currently a Provostial representative that sits on hiring, tenure and promotion committees across the University, and is a former Chair of the Council of the Faculty of Arts and Science. Another role she is currently playing is Vice-Chair of the Ontario Ministry of the Environment’s Multi-Stakeholder Panel on the “Living List” of the Toxics Reduction Act.
A year ago, at the time the last issue of the Alumni News was going to press, the governments of Alberta and Canada were still digesting the recommendations of advisory panels for an independent body to manage the environmental monitoring of the oil sands. Then in February 2012, a “Joint Implementation Plan” for environmental monitoring was announced, including an expanded program for field measurement by Environment Canada scientists.

A dozen of the scientists that had been involved in the various advisory panels (myself included) were invited to take part in a conference-call briefing before the announcement of this plan. Everybody thought that the science plan was excellent, and the questions were all about management. Who was going to be in charge? When we were told that the plan was to be jointly administered by two assistant deputy ministers, one from Environment Canada and one from Alberta Environment, the protests were loud and sustained. The officials managing the briefing did not seem to understand the important difference between the release of raw data and the ability of a government scientist to carry out an independent analysis and offer opinions to the public.

In response, the Alberta government was persuaded to establish another study group to explore the issue of governance, and finally, after some internal pressure from the oil sands industry, which seems, collectively, to have realized that this is a very significant issue, which they have to get right, the Alberta government has come through. On October 17th, Alberta Minister of Environment and Sustainable Development, the Hon. Diana McQueen, released the governance report and announced that she was establishing an independent environmental monitoring agency. Federal Environment Minister the Hon. Peter Kent was quoted in the Globe and Mail the next day saying he did not think such a body was necessary, and one of the outstanding issues still to be resolved, is how the new Alberta agency is to interact with Environment Canada.

At the 2012 National Science Policy Conference held in Calgary in early November, I chaired a panel discussion on the need for a world-class monitoring program for the oil sands. This marked a highly significant moment in the history of the exploitation of this hugely important national resource, and now the real work can begin.

Andrew Miall
Obituaries

JOHN HC RILEY (1921-2012)

John Riley (B.Comm, 1943; Trinity College; M.B.A. 1946) was an enthusiastic amateur geologist who became so inspired by the life story of Yukon prospector Alan Kulan that he and his wife Mary Louise established the Kulan Memorial Lecture Exchange between the Yukon Chamber of Mines and our Department.

John was born in Glasgow but moved to Canada with his family when he was a young child. After graduation he served in the Royal Canadian Navy during the last years of World War II, returning to complete a master’s degree before beginning employment at the Toronto Star where he rose to the position of business manager. He was subsequently recruited to California by the Santa Rosa-based Press Democrat, the largest-circulation daily newspaper in the north San Francisco Bay area.

John had a lifelong interest in theology and geology and was an enthusiastic hockey and tennis player and a golfer well into his senior years. He loved to travel, especially after he retired in 1985, and it was during trips to the Yukon Territory that he and Mary Louise came across stories of Alan Kulan’s life (and death) as a prospector. A link between Kulan, U of T and the ROM was established when he sent mineral specimens for identification. Emeritus Professor Digger Gorman and ROM mineralogists Joe Mandarino and Darko Sturman discovered several new species, including kulanite and gormanite.

John and his wife approached the then-Department of Geology in the early 1990s with a suggestion to recognize Kulan in a meaningful way and the Lecture exchange was launched with a visit to the Yukon by Steve Scott in 1994. (In alternate years a Yukon based geologist lectures in Toronto.) The programs always include public and professional lectures as well as visits to local high schools. The Toronto segment often included a visit to Bishop Strachan School where Mary Louise was an alumna. When the lecture series was well established, John expanded his efforts to memorialise Kulan and was the main driving force that led to Kulan’s induction into the Canadian Mining Hall of Fame in 2005. John was a great conversationalist and loved to talk about his life experiences, especially those involving geology and his travels.

The Kulan Exchange Program would not have been possible without financial support from John and Mary Louise. We have lost a good friend and have sent our condolences to his wife and family.

DON FRECKELTON
B.A.Sc. Geological Engineering 1971

Don passed away April 2, 2010 in Calgary following a courageous fight with cancer.

Although Don left the mineral industry in 1989 to start what would become a very successful printing business, his love of geology and exploration continued throughout his life. Don remained active in Calgary’s Mineral Exploration Group and dreamed of returning to the field some day. Don’s constant good nature and generosity are sadly missed.

Robert Didur

JOHN CHARLTON
B.A. 1942 – Chemistry, Mineralogy and Geology, passed away January 12, 2013. He had recently been in contact with the Department about his latest endeavours. See page 13.
Graduating Undergraduates

Caitlin Beland
Deng Ngang Deng
John Grant
Jennifer Lee
Sarah Miranda

Rabi Nizami
Liviu Parpalea
Danica Pascua
Pamela Patraskovic
Jared Shilson

UNDERGRADUATE AWARD WINNERS

Natural Science and Engineering Research Council of Canada Undergraduate Student Research Awards
Ka Wan Natalie Chu
Jennifer Helleur
Sean Winland-Gaetz

The Roger E. Deane Memorial Scholarship in Geology
Ross Gilmour

The H.V. Ellsworth Undergraduate Award in Mineralogy
Kun Guo

The Joubin James Scholarship and Prize
Giancarlo Jones

The Alexander MacLean Scholarship in Geology
Pierre Grondin-Leblanc

The Garnet W. McKee-Lachlan Gilchrist Scholarship
Ken Loon Choo

The James P. Nowlan Explorers Fund Undergraduate Scholarship
Deng Ngang Deng

The Wesley Tate Scholarship in Geology
Danica Pascua

The Daniela and Alexander Tintor Undergraduate Scholarship
Faith Meadows

The Nicholas Wemyss Undergraduate Explorers Fund Award
Ka Wan Natalie Chu

The Frederick W. Schumacher Scholarship
Alex Pernin

KEGS Foundation Scholarship
Kun Guo

The Don Salt Scholarship
Faith Meadows

The Daniel Wilson Scholarship in Earth Sciences
Chen Yu Hwang

University of Toronto, Department of Earth Sciences
Annual Alumni Reception in Toronto during the PDAC
Tuesday, March 5, 2013
at the Fairmont Royal York, Library Room
5:00pm to 7:30pm
Graduating Graduate Students

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<th>M.Sc.</th>
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<tr>
<td>Adrienne Campbell</td>
<td>Calvin Chan</td>
<td>Abin Das</td>
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<td>Chiu, Wing Yan (Karen)</td>
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<td>John Eliades</td>
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<td>Kaitlyn De Lught</td>
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<td>Sandra Kamo</td>
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<td>Stephanie Mabee</td>
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GRADUATE AWARD WINNERS

Natural Science and Engineering Research Council of Canada Alexander Graham Bell Canada Graduate Scholarship
Robert Gray

Natural Science and Engineering Research Council of Canada Postgraduate Scholarship
Phoebe Chan Herb Maier
Ben Moulton

Ontario Graduate Scholarship
Benjamin Hook

The Queen Elizabeth II Graduate Scholarships in Science and Technology/Canadians Resident Abroad Foundation Graduate Scholarship
Veronika Shirokova Allison Enright

The Queen Elizabeth II Graduate Scholarships in Science and Technology/J.J. Fawcett Graduate Scholarship
Kohen Bauer Neil Krystopowicz
Trevor Brisco Laura Quigley
Lisa Douglas

Connaught Fellowship
Neil Bennett James McCarthy
Neva Fowler-Gerace

Graduate Explorers Fund
Anastasios Venetikididis

The Jeff Fawcett and John Gittins Graduate Explorers Fund
Caitlin Beland Nathaniel Walsh
Therese Garcia

Irene Gale-Rucklidge Explorers Fund Graduate Scholarship
Katrina Van Drongelen

Richard Bedell Explorers Fund Graduate Scholarship
Simon Comtois-Urbain

James P. Nowlan Explorers Fund Graduate Scholarship
Anna Phillips

Nick and Marilyn Tintor Explorers Fund Graduate Scholarship
Anastasios Venetikididis

D.H. Gorman Explorers Fund Graduate Scholarship
Heidi Tomes

Dr. P.C. Finlay, Q.C. President’s Fellowship
Stefan Markovic Tugce Sahin

Dr. Norman Keevil President’s Fellowship in Geology
Vlad Ene Renjie Zhou

Margaret Amelia Miller Scholarship
Vlad Ene Renjie Zhou

A.T. Griffis Memorial Graduate Scholarship
Tugce Sahin Stefan Markovic

The H. V. Ellsworth Graduate Award
Veronica Di Cecco Daniela Serodio

Laurie Curtis Teaching Assistant Award
Rosemary Oakes Heidi Tomes

KEGS Foundation Scholarship
Laura Quigley

Student Travel Grant
Allison Enright Stefan Markovic
Robert Gray Katrina Van Drongelen
Most diamonds are brought to Earth’s surface as accidental inclusions in the volcanic rock called kimberlite and, worldwide, almost all kimberlites that contain diamonds have been emplaced through crustal rocks of Archean age. As Canada is endowed with enormous tracts of Archean rocks, it was a puzzle for many years why diamonds were not known from Canada. All that changed in the early 1990s when it became known that some very diamond-rich kimberlites had been discovered in the Northwest Territories, and the Great Canadian Diamond Rush began. As a result of this, the largest staking rush in history, hundreds of new kimberlites were discovered in Canada and a renewed interest in diamond exploration and mining spread throughout the world. Canada joined, and quickly rose high in, the ranks of diamond-producing nations and currently ranks third in the world in terms of value of diamonds produced, surpassing even South Africa.

For researchers interested in diamonds, another significant change accompanied these discoveries. There were now many new companies involved in diamond exploration (and some ultimately in diamond mining), and access to diamonds for research became a little easier. Previously, access to diamonds for research was virtually restricted to a small club of those with close connections to De Beers who controlled most of the world’s diamond supply (plus a handful of Russian researchers working on Siberian diamonds). Through the generosity of some of these smaller companies my research into diamonds was greatly expanded and, in most cases, it was alumni of the Geology Department who facilitated such diamond access.

Over the past several decades, many researchers have come to accept that some of the material that forms the subcratonic lithosphere formed by emplacement of subducted oceanic crust in the Archean and Proterozoic. Accidental inclusions of many mantle-derived eclogites (some containing diamonds) in kimberlites have compositions equivalent to subducted ocean-floor basalts and their oxygen isotope compositions are consistent with those of basalts modified by sea-floor alteration processes. How this related to diamond-forming processes was unclear, however, as none of the eclogites, though clearly anomalous in their oxygen isotope signatures, approach the extreme values of supposed ocean floor basalt equivalents. Why not? Part of this mystery was solved with our work on minerals trapped inside diamonds from the Guaniamo region of Venezuela, samples provided by U of T Geology alumni Dominic Channer and Patrick Anderson.

As diamonds are impermeable and generally unreactive, minerals trapped within them during diamond growth can preserve information on the chemical and physical environment of diamond growth billions of years ago. But the minerals are tiny and are not amenable to standard techniques used in isotope analysis which require significantly more material than is present in a single mineral included in a diamond. In collaboration with colleagues at the University of Wisconsin and the University of Edinburgh (and James Brenan here at home), we studied the oxygen isotope compositions of coesite inclusions (coesite is a high-pressure polymorph of quartz) in polished sections of Venezuelan diamonds using an ion microprobe. The astonishing results, published in Nature, demonstrated that the extremely anomalous oxygen isotope compositions expected for subducted oceanic basalt are indeed present in the mantle, but apparently only survive inside the
impermeable diamonds. Outside of the stones, oxygen in eclogite minerals is free to exchange with the surrounding “common mantle” oxygen. These results went a long way toward convincing most of the “skeptics” that many diamonds are related to subducted oceanic crust, as there is no other accepted way to create such oxygen isotope anomalies in the upper mantle. One of the diamonds from this study is shown in an accompanying photograph, a cathodoluminescence image of a 2mm stone with two coesite inclusions, two clinopyroxene inclusions and one of kyanite.

But what about the diamonds? Decades of work analyzing the carbon isotope composition of diamonds by conventional techniques (analyzing bits of crushed diamond) had revealed that some diamonds from eclogites have carbon isotope signatures that are unusual for values typical of mantle materials (such as carbon in carbonatites). Early suggestions for the origin of these unusual carbon signatures focused only on the mantle, viewing them as the remnants of primordial mantle inhomogeneities or the results of fractionation of carbon from mantle fluids during diamond precipitation. Later suggestions arose that, as the anomalously light carbon isotope values of some diamonds mirrored those of biogenic (i.e., organic) carbon, the carbon might have also been subducted along with the ocean floor basalts. The mantle hardliners refused to consider this as an option, sticking with an origin for the light carbon as due to fractionation of mantle fluids, and unrelated to origin of the eclogites themselves.

We addressed this problem by extending our ion microprobe stable isotope studies to include carbon isotope analyses of the diamond hosts to the silicates (coesite and now also garnet) in diamonds from Venezuela as well as diamonds from Botswana and Australia. We found that there is virtually perfect anticorrelation between heavy oxygen signatures of silicates (ocean floor alteration) and light carbon isotopes in the host diamonds. This is compelling evidence that the carbon in these diamonds is of crustal (biogenic) origin, as all of the minerals with heavy (oceanic) oxygen are enclosed in diamonds with light carbon isotope values. The link between these two systems in these diamonds is now firmly established and this strong association is just not possible to produce any way other than by subduction. The carbon and oxygen isotopic systems are decoupled, but their anomalous values are linked by formation in a common geologic environment by unrelated processes. These results are in press in Geology and should finally convince all but the most unreasonable skeptics that many diamonds contain biogenic carbon.

Interesting results have also come from our studies of Canadian diamonds. With the help of alumnus Matt Manson, we obtained diamonds from the Diavik Mine in the Northwest Territories and from the Lynx kimberlite in the Abitibi Belt of Quebec, material that formed the basis of a Ph.D. thesis for Adrian Van Rythoven (completed in 2012). In an ion microprobe study of the carbon isotope composition of the Lynx diamonds, Adrian found that these stones have anomalously heavy carbon isotope signatures relative to most suites of diamonds worldwide. Only three similar suites of diamonds are known, two of which are also from occurrences in the Superior Craton. Models that predict carbon isotope signatures like these involve either fractionation schemes that are unusual for mantle fluids or formation from subducted crustal carbonates. What is it about diamond formation beneath the Superior Craton that makes these populations so different from most of the rest of the world? That is one question I hope to address in future work, as a suite of diamonds from a new kimberlite from the Superior Craton is promised and should arrive soon.

Although the Canadian diamond rush has lost much of its steam, exploration and discovery are ongoing at a smaller scale. There are recent discoveries that are very promising and have good potential for mine development, including the Renard kimberlites (adjacent to the Lynx occurrence) and the Chidliak kimberlites on Baffin Island. I don’t know if the world really needs more diamonds for jewelry, but researchers can certainly benefit from more material to study.
What are the students saying about the Field Education Fund?

Field Education has been a focus of fundraising in the Department providing opportunities for our undergraduate students to study in a variety of field areas around the world and gain knowledge and experiences not possible in a classroom setting.

“I was lucky enough to attend the 2012 Geological Society of America’s annual conference in Charlotte, North Carolina. I presented a poster about our 399 research where I and seven other students had used geophysical techniques to map an aquifer. I was told to expect hard questions. But most everyone was impressed with the poster – one professor could not believe it was an undergraduate project. The experience made me so proud of the work the group had done. I realized how lucky I was to be able to do a research project in my undergraduate career.”

Sara Nicholson, glg399 student

“We’ve always been interested in Geology, actually going to Texas on a field course made me realize how truly exciting this career path can be. Being in the field and exploring is one of the most amazing aspects of Earth sciences.”

Natascia Zuccarelli-Pegoraro, geoscience major
Titanic Gravestones
An Exercise in Forensic Petrology

In 2012, the centennial year of the sinking of the Titanic, most of the mysteries surrounding that tragic event have been solved, but not the mystery surrounding the origin of the gabbroic headstones that mark the resting places of 150 victims buried in Halifax. What began as a practical question (how do we get the same material to replace a frost-damaged headstone?) has long-since become a largely academic Sherlock Holmesian question (where on this planet does this particular olivine-bearing noritic gabbro originate?). In the absence of any historical record of the source from which the White Star Line purchased the headstones, we are left to solve the problem purely scientifically. Any candidate outcrop, or presumably overgrown and long-forgotten former quarry, must match the headstones in terms of its mineral assemblage, textural features, chemical composition, and age. These parameters collectively define the “geological DNA” of the gabbro, and so the DNA of the parent quarry must match the DNA of the daughter headstones. Armed with a date of 422 ± 2 Ma (incidentally, not known in southern Nova Scotia), we have searched the Appalachian-Caledonian orogen from Maine to Scotland for gabbros of similar age. In particular, our methodology involves visiting scores of cemeteries and looking at thousands of “black granites” (as gabbros are called in the monument trade). The rationale for this approach is that, one hundred years ago, most quarried stone was used locally, so that monuments with Titanic textures should be highly abundant near the source quarry. After drawing blanks almost everywhere, our search has now centred on southwestern New Brunswick where formerly quarried gabbroic plutons with the right age exist, and where headstones with similar-looking textures also occur. We are now at the stage of trying to locate all of the century-old quarries in this region, and are fairly confident that we can find the one with the physical, chemical, and temporal characteristics that match the Titanic headstones in Halifax, within an acceptable margin of error. Follow our progress at: http://earthsciences.dal.ca/www/titanicgranite

James Cameron, the director of the film “Titanic”, claims he did not know that a J. (Joseph) Dawson was on board the ship as a member of the crew and was a real victim of the sinking of the ship.

Barrie Clarke (6T4) clarke@dal.ca
Alan Ruffman (6T4) aruffman@dal.ca

John R Charlton

B.A. 1942 – Chemistry, Mineralogy and Geology, together with Robert Ferguson (Emeritus Professor University of Manitoba) and the late Solomon (Sol) Kaiman made up the class of 1942 in that program and all three worked under the direction of the renowned mineralogist Professor Martin Peacock. He spent summers doing field work in Eastern Ontario under the supervision of Bill Harding, VB Meen and Professor EL Bruce of Queens University. As a result of his X-Ray analysis work and supplementary spectroscopic work in the Department of Physics, John was hired by Alcan to run their spectrographic laboratory at Beauharnois, Quebec. At that time he also took painting lessons at Sir George Williams College, now Concordia University. During the academic session he worked as an assistant cook in a student residence near Knox College. He remembers Les Nuffield, later to be Department head, then Chairman, as a graduate student at that time. After a five-year period in the U.S. John returned to Alcan where he stayed until his retirement in 1985. His second career as a full-time painter then began in earnest. He specialises in city scenes, landscapes and portraits. The very well-known Toronto artist, the late Doris McCarthy, awarded him a prize for his painting, *The Advance of the High Rises* that he has now kindly donated to our Department and hangs in the Chair’s office.

He writes: “Yes certainly the rigorous training I got from Martin Peacock has influenced my painting. I would also note that my drawings of fossils got me high marks from Miss Fritz but I did not save them.”

In a 2011 talk to the Bellevue Washington branch of the American Chemical Society, he made several references to minerals used as pigments in oil paints. In April 2012 he was organizing his latest works for a showing in Surrey B.C. – all this at age 93! (See page 9)
Undergrad News

We are bringing forward to the Arts and Science curriculum committee a revised geology program which reflects a discussion among our faculty and students. Students have asked that courses align better with APGO knowledge requirements. At the same time, the Department needs to be realistic about our teaching resources. Instead of having a suite of fourth-year courses on the books which we cannot teach on a consistent basis we are suggesting two special topics courses which will allow us to offer specialised courses on a rotating basis. Core courses will remain inclusive to students in the environmental geology, geophysics, and mineral engineering programs.

This summer we welcomed faculty from geography to the new Department of Earth Sciences. They will contribute to our teaching and their expertise and interests will nicely mesh with fresh ideas about the environmental geosciences specialist program. Environmental science at U of T is also getting a new boost as the new School of the Environment is forming, and faculty from Earth Sciences are involved in discussions about their new programs.

Our field education is continuing to flourish. Second-year students were joined by three students from the first-year introductory course on a trip to Big Bend National Park in Texas. Over reading week they explored sedimentary strata, igneous features, and folds and faults with only one night of rain. For several of them it became a life-changing experience. During the same time, the third years explored the Colorado Plateau, a first for the sedimentary geology course; several of you will have followed their live blog. And for the revamped geophysics specialist program a geophysics field course was also offered for the first time, together with the hydrogeochemistry fieldcamp—this provided ample opportunity for professional and personal interactions between the two groups of students (and also the faculty).

Evolution of the Department

The Department was founded in 1852 with the establishment of a Chair of Mineralogy and Geology. For the next 92 years a somewhat bewildering variety of names graced our letterhead, including Mineralogy and Geology, Geology, Mineralogy and Petrography and Geology and Paleontology. In 1944 the Department of Geology and Paleontology and the Department of Mineralogy and Petrography were merged to create the Department of Geological Sciences, a name that held sway until the mid-1960s when, under EW Nuffield, Head and then Chairman, the name was changed to Department of Geology.

Beginning in the 1990s several attempts were made to “modernize” our name but it took Russ Pysklywec to make it happen.

Geophysical Applications in Forensics:

Geology student Robin Wolf and geophysics student Intesar Raisuddin are participating in a very interesting and unique research excursion led by Dr. Charly Bank.

The students along with Professor Bank have been working closely with the Ontario Provincial Police’s USAR CBRNE Response Team (U.C.R.T.) on the use of geophysical methods and their forensic applications. The specialized unit’s mandate is to support the province in major emergencies and threats ranging from urban search-and-rescue to chemical, biological and nuclear disasters.

The research is being conducted at an undisclosed test site, where weapons, steel drums and pig carcasses have been buried to simulate clandestine graves and caches. The challenge is to determine which geophysical method is the best for use in forensic searches.

So far, Robin and Intesar have uncovered promising preliminary results with magnetometry at the UCRT test site. Their research will continue throughout the year—look for an update on their findings in January 2013.

Charly Bank
In the year that the Department of Geology welcomed the symbolic transition to the Department of Earth Sciences, so began a new tradition that we hope will continue for generations to come. The Earth Ring, like its renowned iron cousin, is a symbol for humble professionalism and commitment that we expect from our alumni at U of T.

“Like the engineer’s iron ring, the Earth science ring’s simplicity and strength bear witness to the calling of the geologist and geophysicist. The ring is made of silver and marked with the crossed hammer of geology and with the seismic trace of geophysics—signifying both the immediate and the remote searching out of Nature’s knowledge. Without beginning and without end, it also represents for those who wear it the continuous interplay of ideas and of material realities.”
(Erdmer and Krebes, APEGA)

The tradition began nearly 40 years ago in Alberta, and has since been introduced to several universities across Canada, including our very own. To be eligible, the recipient must meet the academic requirements for APGO or an equivalent certification, and attend the private oath-taking ceremony in spring. While it is primarily an undergraduate distinction, we invite all eligible graduate students, faculty, and alumni to receive their rings at the 2013 ceremony.

Going forward, these traditions will bring a sense of camaraderie and accomplishment that our students will aspire to achieve for many more years to come. Many thanks to Russell Pysklywec, Nick Tintor, Laurie Curtis, Ed Spooner, and Charly Bank for their encouragement and support.

Rabi Nizami

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**TMX Experience**

**Richard Bedell**, 1985 Earth Sciences/Geology alumnus (fourth from the right)
President and CEO of Renaissance Gold Inc.
opened the Toronto Stock Exchange for the second time on October 15th, 2012, and was accompanied by several undergraduate and graduate students of the new Department of Earth Sciences, and Professor Ed Spooner (second from right), who were on hand to see the opening and to meet and mingle with Renaissance Gold Inc. members and TMX staff.

Richard also visited campus the day earlier to give a talk on his mining experiences in Nevada.

The photo was provided by TMX
In late August of this year, 12 upper-level undergraduates embarked on a new “capstone” field school which explored the igneous, metamorphic and sedimentary record of the opening and subsequent closure of the Iapetus ocean, as exposed in Newfoundland and Labrador. The itinerary included Precambrian coastal exposures of southeastern Labrador, the allochthons exposed near the UNESCO world heritage sites at L’Anse aux Meadows and Gros Morne National Park, the global stratotype section for the Cambrian-Ordovician boundary at Green Point, as well as the rich fossil localities of the Port-au-Port Peninsula, Table Point and Flowers Cove. Over the 16 days of the field school, students saw outcrops of the oceanic upper mantle, stood on the Moho, and saw world-class exposures of paleokarst, shallow marine carbonates, and time-equivalent continental shelf and slope successions. The trip was led by Professor James Brenan and Mr. Neil Bennett.

For many students of geology, their experience with economically significant rocks is confined to hand samples examined in a mineral resources lab. However, on March 15, 2012, 18 students and two faculty members from the University of Toronto embarked on what would be, for many, a journey deeper into the earth than they had ever gone before. These students and professors made the eight-hour-plus drive to Val-d’Or, Québec, to tour two of Agnico-Eagle’s mines: the LaRonde gold-rich VMS deposit, and the Lapa orogenic gold deposit, both of which are in the proximity of the Cadillac-Larder Lake Break. The group was guided around each mine by its senior geologists, who explained the genesis of the ore, as well as the mining methods being used to extract it. They also saw an open stope and some of the huge machines used up close and in action. Towards the end of the day, the group stopped at a lookout point overlooking some of the Abitibi region’s mines.

The weekend trip ended with a visit to a drilling company, Orbit-Garant, who were eager to show the group their latest in state-of-the-art drilling equipment at their Val-d’Or office. On the way back to Toronto, the group briefly stopped by the historic mining town of Cobalt, Ontario to visit Adroit Resources’ coreshack and collect minerals nearby abandoned mines.

With their brief yet valuable hands-on exposure to exploration, drilling and mining, everyone came home with a renewed enthusiasm for the mining industry and the entire profession of geology. The group is grateful for the following organizations for the financial support that made this trip possible:

- Prospectors and Developers Association of Canada
- Society of Economic Geologists, University of Toronto, Student Chapter
- Department of Geology, University of Toronto

Allison Enright and Danica Pascua
In September 2011, I was sitting in GLG360, waiting for the professor to come in not knowing that this class would result in one of the most amazing experiences I’ve ever had. All I remember was Uli (Dr. Uli Wortmann) saying, “Let’s go on a fieldtrip in the U.S.” It sounded a bit crazy, but over the next couple of months the plan took shape and on February 17, 2012, we found ourselves on an early morning flight to Las Vegas where we were met by Uli, Dr. Gerald Bryant (Ph.D. 2011) of Dixie State College of Utah, and his wife, Debbie. We first visited Death Valley National Park and then the Valley of Fire State Park (Nevada), and for two days we saw and examined thrust sheet dynamics, alluvial fans, dunes and piggy back basins. The next evening, we arrived in St. George (Utah), enjoying the first warm showers of the trip. The following morning we looked at impressive landslides which handily demonstrated why you should ask a geologist before you build. Next we explored the Miocene Pine Valley Mountain laccolith (likely the largest in the world), followed by an afternoon excursion into Quaternary lava tubes at Snow Canyon State Park. The rest of the afternoon was spent looking at the Hurricane fault zone, which separates the Colorado plateau from the Basin and Range province, followed by a bath in a natural (i.e., fault related) hot spring on the banks of the Virgin river.

Days six and seven were my personal picks for the best two days of the entire trip. First, we searched for dinosaur tracks in the back country near Kanab and rode in pick-up trucks to an isolated location, where we could follow large dinosaur tracks for 20 to 60 meters. This was followed by a day at Zion National Park, a small, but beautiful park, with incredible outcrops of the Aeolian Navajo Formation.

Days eight and nine were even more exciting. We walked on the “Geological Time Trail,” at the Grand Canyon which has beautiful specimens of the Paleoproterozoic outcrops found deep inside the canyon proper. On our last day in the field we continued our way south, visiting the San Franciscan volcanic complex near Flagstaff and Meteor Crater. An amazing field trip finished with a night in Las Vegas. And then it was over. This trip would not have been so enjoyable and instructive if it weren’t for our sponsors, the hard work of Uli, Jerry, and the great group of people taking GLG360. Thank you everyone!

Ramon Nagesan

Dr Fawcett—Great to hear from you! And yes, time certainly seems to be passing very quickly although I have to admit that looking back over the past 40 years it has been an adventure in many ways. Watts, Griffis and McOuat kept me reasonably busy with interesting jobs in China, Mongolia, Mexico, Peru, USA and Canada before things ‘dried up’ in 2009. Since then, I’ve gone to Mauritania (2010) to review iron ore prospects. I had a great opportunity to put on my geology hat again and fully enjoyed it. I worked for a start-up junior exploration company out of Calgary on a property in the Purcell Mountains in BC only four hours from home. As technical advisor and project manager, I spent three relatively short field seasons diamond drilling, prospecting, exploring 110-year-old ‘mines’—all above 8500-foot elevation. I got to re-open old workings and used my 1970’s Chibougamau skills to wash and map the drifts. It was like going full circle! I must say that it was invigorating (and healthy) working at those elevations and quite satisfying as not only did I make an original surface discovery of massive sulphides in 2009 but successfully interpreted fault/fold structures and potential locus for mineralization in the dolomitic host rocks and proved it all with a successful diamond drilling program in 2011 that intersected an entirely new polymetallic (Pb-Zn-Ag-Au) manto & vein system at depths of 150 metres below surface! So basically I have entered my transition to retirement although many of my long-time friends continue to take on jobs. Certainly there is no lack of opportunities out there but I have made my decisions in concert with my wife. I have always felt honored to have received a quality education both in secondary school and certainly at U of T. The U of T degree has been well-received worldwide. Thank you for your part! Cheers. Robert

Roger Hewins (Ph.D. 1971; Naldrett group) reports from Paris that “U of T held two functions here last week. Drinking bubbly with the Honourable David Peterson one day and his Excellency Mr. Marc Lortie the next. The ambassador’s residence is very classy.

Wally Ng Se Quan and Horst Helbig (both B.A.Sc. 1973) visited the campus in 2012 and spent a long lunch with Jeff Fawcett summarizing almost 40 years of experiences, most of them mineral exploration-related and reliving some of the activities in Geological Engineering during the 1970’s.

Bruce Downing (M.Sc. 1973) see page 8

David Unger (B.Sc. 1979; B.Ed. 1984)
I have the dubious distinction of being a member of the graduating class of 1979. I fondly recall a small group of us somehow finding our way into the attic of the Mining Building, where we wrote our names on the timbers supporting the roof. Other highlights, no doubt common to all graduating classes, include late nights in the thin section lab vainly attempting to draw mineral assemblages; antics in the cavernous paleo lab (in the basement, or so I recall); and trying, with marginal success, at understanding what a phase diagram was.

I worked full-time in the mineral exploration industry for 12 years following graduation in 1979. During this period I worked for Falconbridge, Riocanex, UMEX and AGIP. The majority of these years were spent working on base and precious metal projects in northern Ontario and Quebec, although with AGIP I had the pleasure of working in Yukon and enjoying the multitude of fine taverns in Whitehorse. I also spent a brief period providing geological consulting services to the securities industry; in this role I looked at exploration plays in South America, southern Africa, and Russia.

The vagaries of commodity prices during the 1980s led to occasional bouts of unemployment, and after finding myself walking the pavement once again in 1991, I decided to leave the exploration racket and opt for the longer-term stability of a career as a high school teacher. So, since 1992 I have been teaching mathematics at a north Toronto high school, and am thoroughly enjoying my second career. My students listen wide eyed to my tales of life in the bush, surely exaggerated in the telling, and of the joys of being a field geologist.

On the personal side, my wife Carrie’s job as a senior human resources professional took us on an eight year ex-pat assignment from 2000 to 2008, when we lived in China, South Korea, Belgium, and Russia. I occupied my time teaching ESL, a very interesting job indeed. We have now settled in south Mississauga.

Thanks to Professor Jeff Fawcett for editing Alumni News. Cheers Professor!

80s

Randy Miller (M.Sc. 1979; Ph.D. 1985; Gittins group) is now Vice President Exploration at Search Minerals Inc, a Labrador- based company engaged principally in rare earth discovery and development.

Pam Strand (B.Sc. 1988), resigned as President of Shear Diamonds Inc. to become Chair of the Chamber of Mines Nunavut/NWT and was also appointed President and CEO of Firestone Resources.
A Happy Coincidence

Martin Van Kranendonk, whose scientific work is being recognized internationally, did his B.Sc. and M.Sc. projects with Fried Schwerdtner, his Ph.D. project with Herb Helmstaedt and his postdoctoral research with Bill Collins. Martin has recently accepted a faculty position at UNSW (Australia), and was a keynote speaker at St. John’s 2012. The photo was taken when Martin and his former supervisors met by chance in a hallway, during the recent GAC-MAC meeting.

Terri Ottaway (B.Sc. 1981; M.Sc. 1991), curator at the Gemological Institute of America in Carlsbad, California writes, “I am indeed managing to weather the [economic] turmoil…it’s been going on so long that it almost feels normal. Fortunately the silver lining is that the fear of inflation is driving people to purchase high-end gemstones. And when you’re spending that amount of money, you want to feel confident of what the gem is, where it was found and whether it’s been treated. All these factors weigh heavily into the gem’s value and that’s where GIA’s lab reports come in. GIA has just opened new labs in Israel and Japan in addition to Bangkok, Botswana, Mumbai and Hong Kong. Gems are big business – at least the top end.”

John Stix (M.Sc. 1985; Ph.D. 1989)

For the past 13 years I have been a professor at McGill University. My focus has been and continues to be the study of active volcanism in every shape, size, or form. I specialize in volatiles in magmas and caldera systems. Volatiles are cool because they influence nearly every aspect of a magma’s behaviour from the mantle to the atmosphere. Calderas are amazing because they are associated with some of the largest eruptions on Earth, or in popular parlance, supervolcanoes. Many people don’t like this last term, but I do, since it really provides a flavour of what such an eruption is all about. Some of my recent and current research has been looking at the three most recent large calderas in the western USA: Yellowstone in Wyoming and Montana, Long Valley in California, and Valles in New Mexico. There my group and I have been looking at how magma replenishments nourish the systems and also trigger the big eruptions. We have also been using a new field-portable stable isotope mass spectrometer to measure the flow of carbon dioxide from faults in Long Valley. We are doing this work in collaboration with Barb Sherwood Lollar and her group. I also have been getting into submarine calderas in the past few years by collaborating with Dave Clague at Monterey Bay Aquarium Research Institute (MBARI). I am totally a landlubber, but Dave has helped me over my inevitable seasickness and we have done some great dives on Axial volcano – what a wicked place! – and now also on the Taney Seamounts west of San Francisco. It has been fun to talk to Steve Scott about this work.

I am continuing my interest in Latin American volcanology with some interesting projects in Nicaragua. My postdoc Marc-Antoine Longpré and I have been studying Cosigüina volcano which had one of the Americas’ largest eruptions in 1835 with a massive output of sulfur which affected global climate. We are also looking at Cerro Negro, a very volatile-rich basaltic volcano which exhibits violent eruptions punctuated by periods of extreme quiescence, which is a real problem in terms of how to warn people when the volcano re-activates. We are running a workshop in Nicaragua in May 2013 funded by IDRC and NSF which will look at the state-of-the-art about volcanotectonic interactions. To complement all this fun fieldwork, my group also does analogue modeling to study magma dynamics and surface and subsurface caldera processes. This provides a really nice complementary look at how volcanic and magmatic systems behave. I am also an editor for the second edition of the Encyclopedia of Volcanoes. The first edition was published in 1999 and turned out to be a bestseller. We are hoping to make an even better Encyclopedia this time round, and it will be printed and also available as an ebook with videos, animations, etc.

Life at McGill is great because the students, both undergraduate and graduate, are amazingly good. My faculty colleagues are similarly inspiring, and we have had a huge influx of really talented young profs in the past seven years. So the department is brimming with energy.

I remember with great fondness my time as a grad student at U of T. The intellectual atmosphere was so good, and the students and profs just great. It was a super atmosphere in which to nurture young talent. My Ph.D. supervisor Mike Gorton taught me how to wring out the last piece of useful information from data which I had collected. He encouraged me in many, many ways and gave me incredible freedom to
follow my own path. I try to do the same for my students. I left just before the department moved from the Mining Building to the new building. I sort of missed not being part of that. On the other hand, I got to experience mice running up and down my petrographic microscope when I was working late at night. I also remember fun basketball and volleyball sessions, and the Festive Fridays were always a hoot and always interesting. The perfect way to end the week.

90s

Dick Jemelita (PDF Spooner group 1987-1990) is now Director Geosciences, North America at Kinross Gold

Dominic Channer (Ph.D. 1994; Spooner group) is now Vice President, Ecuador, Kinross Gold

Alex Borowik (B.Sc. 1993; M.Sc. 1998)
The family moved from Bath, England to the Cobourg area in late 2009. Alex is busy with the kids, a planned renovation of their old Ontario farmhouse and maintaining the property. Her husband, John, is currently with CCMining S.A., a member of the CCC group.

Denton S Ebel (PDF Naldrett 1990’s) is now Curator, Dept. of Earth and Planetary Sciences and Chair, Division of Physical Sciences, American Museum of Natural History in New York.

‘00’s

Parisa Sattari (B.Sc. 1995; M.Sc. 2000)
Shortly after finishing her Master’s program under the supervision of James Brenan, Parisa started her career as a team coordinator for one of the banking centers at CIBC, based initially in Thunder Bay.

She also got herself involved in geology by assisting in setting up an experimental research laboratory, advanced research and industry projects including mineral and fluid inclusion analysis for Lakehead University faculty and several exploration companies. Around the same time, she participated in the SHAD Valley program offered by the university to introduce high school students to the advanced academic techniques and instrumentations used in high-end scientific research environments. Parisa is currently residing in Richmond Hill Ontario to be close to her family. She moved into the world of finance temporarily where she has successfully established a state of the art CIBC-branch in her community with her team over the last couple of years.

In her free time, she enjoys running and other activities to raise funds for the United Way Youth campaign and for cancer research. parisasantari@yahoo.ca

David Andrews (B.A.Sc. 2000; M.Sc. 2002; Brenan group)
After finishing my Master’s in experimental igneous petrology I went on to do a little work with Jim Mungall and Louis Cabri. We got a paper out of that work.

In February 2003, I was hired by INCO as an engineer-in-training. My undergrad is in geological engineering and the mix of both engineering, and geology has served me well in this company (now, of course, Vale).

The next few years I spent working through the mines in Sudbury and the surface exploration group in both technical services and geological roles—everything from underground surveying and ventilation through to production geologist at Creighton, North, South, Coleman mines. I learned to do resource estimates working on what developed into the reopening of the Garson Ramp mine.

From there I headed back to Creighton as a resource geologist building the geostatistical models that would be used in the Creighton Deep Prefeasibility study, and eventually became the Chief Mine Geologist accountable for all production geology, grade control, diamond drilling and exploration at the Creighton Mine property.

Highlights during that time was management of an $8 million-plus underground drilling and geophysics exploration program over two years that resulted in the discovery of a new deposit at Creighton Depth. I got to name it. I called it the 649 Ore body because we all felt like we had won the lottery.

In 2009, I moved more into economic geology and project evaluation as the Chief Engineer of Business Analysis for Ontario operations.

Since then my plate has grown to include all of Vale North Atlantic operations business and strategic planning. I manage a portfolio, from a strategic business optimization point of view, that includes eight operating mines, three concentrators, two operating smelters, two nickel refineries, a cobalt refinery and a precious metals refinery. Thompson, Sudbury, Voisey’s Bay. I also run all the discounted cashflow evaluations for major mining projects and expansions in Canada, encompassing mine production, metallurgy, processing, and investments. It’s economic geology at it’s finest.

On the personal front, I have to say the highlights since then are the marriage to my darling wife, Karen, and the birth of my two children, Seamus (3) and Charlotte (2).

It’s been a wild ride over the last few years, with career moves and travel and small children, but I keep sane by cooking. I do all the cooking in our house, because I love it...and we eat like kings.
My family and I live in Lively, a small community just west of Sudbury, and have a frugal camp on Manitoulin Island. That’s our haven. North Shore of Lake Mindemoya is God’s country. We spend our summer weekends here, with the kids and the dog basking in the glory of one of the most peaceful spots Ontario has to offer.

Craig Finnigan (Ph.D. 2006; Brenan group)

Currently I am employed as the Chief Geologist at Kaminak Gold Corporation in Vancouver. We have been incorporated since 2006 and initially formed as a spin out of Shear Minerals whereby Kaminak acquired all of the non-diamond rights on Shear’s claims in the eastern Arctic. Pamela Strand, who is another U of T, graduate was the CEO of Shear at that time. In 2008, we signed a deal with the Inuit making them business partners. The eventual agreement resulted in Kaminak being the first company to explore for Uranium on Inuit-owned lands. This allowed Kaminak to explore and expand on the the Lac Cinquante Uranium deposit which now has a NI43-101 compliant inferred resource of 1,779,000 tonnes grading 0.69% U₃O₈, totalling 27.13 million pounds U₃O₈. We spun this asset out into a new company called Kivalliq Energy Corporation which is listed on the TSX-V. In 2009, we acquired the Coffee property in Yukon that had a number of high-grade gold in soil anomalies and through drilling we have made 16 major gold discoveries on the property. To date, we have drilled more than 500 holes with greater than 90% of them hitting significant gold mineralization and have brought the company from a $3 million market capitalization to $140 million. Since 2009, we have raised greater than $50 million in the market for exploration at Coffee.

I am currently living in London, Ontario and I am an adjunct faculty member at University of Western Ontario. I have co-supervised one master’s student and one bachelor’s student and I am currently supervising a masters student who is working on the Coffee Project.

Who is this man?

E-mail your answer to the Editor by March 1, 2013. The first two correct answers will receive a prize at the Department’s PDAC reception, March 5, 2013.

Tweed 1978 photo update

In last year’s Alumni News we asked for help identifying the people in the 1978 Tweed class photo.

Dave Unger of the class of 1979 responded:
“I can help a bit with the Tweed 1978 photo in the February issue of Alumni News. I agree with the question mark beside John Siriunas. It may also be John Ostler, but I can’t recall if he wore glasses. Second from left in the red hat is definitely Perry Rautanen. The guy in the back wearing the fedora looks like grad student Dave Weishampel (sp?), but I may be mistaken. The bushy haired guy behind Ellen may be Dwight Christie, but again I am not certain.

Partly hidden behind Oleh is Robin van Steenburgh; to the right of her is Marcia Foster.”

L-R: John Siriunas or John Ostler?; Perry Rautanen; Dave Unger; Maureen Jensen; Dave Weishampel? (in back with hat); Nushy Reid/Stephanian; Ellen Biasucci; Dwight Christie?; Oleh Wowkadow?; Robin van Steenburgh; Marcia Foster; John Thom.6pson (at back); Ann Erhlich (partly hidden); Ken Kryklyw; Mara Matison/Strazdins; ??(with glasses); Diana Weise/Bubulis; Tony Naldrett. Photo taken and provided by David Harquail.
Sedimentary Logging at Table Head NFLD - August 2012. Photo: Neil Bennett

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Thanks to the alumni who sent letters, photos and biographical notes.

Comments and contributions are most welcome – especially news of former students. Send your contribution by regular mail or e-mail: fawcett@es.utoronto.ca

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