

Acadia Geology Alumni/ae Newsletter

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VIEW FROM ACADIA

I was sitting in the Structural Geology lab exam recently, watching the third year students as they struggled with down-plunge projections and Mohr's circles derived from strained trilobites. You may remember your turn in that particular sweatshop – it's something of a rite of passage for many Geology majors. Having run out of small tasks to while away the hours, I took to pondering on how this class differed from classes 10 – 20 – 30 – 40 years ago. It's not quite 40 years since I first studied Structural Geology, but 2012 will mark 40 years since I embarked on university study, and 30 years since I started teaching at Acadia.

The first big change is in the demographics – this class has 7 women and 14 men in it. In my undergraduate class, the first woman ever to study Geology at Aberdeen University was in the year after me, and I recall the backroom whispers about how on earth would she manage to keep up with the men and especially Professor Munro, who was infamous for running up hills. Needless to say our concerns were totally unfounded, and rumour has it she outpaced most of the guys both physically and academically. According to the data I collect for the Council of Chairs of Canadian Earth Science Departments (ccesd.acadiau.ca), women have comprised 40-45% of undergraduate Geology programs now for 15 years, and their numbers are rising in graduate programs and in academia.

Another change is of course in the techno-aids that surround the students in the exam room. Almost all have a computer with them to plot the stereonet, a calculator to add or subtract that awkward 180° to the azimuths, and a plethora of gadgets that ensure connection with the world or music to blank the world out. Only one telephone went off in this exam, much to one student's embarrassment, but I swear I heard blackberries and iphones buzzing every 10 minutes. Interestingly, the four people who plotted the stereonet by hand all got the data placed correctly, but 35% of the students who plotted on the computer plotted planes as poles or poles as planes. Lesson here: you've got to know what you are doing with those black (or silver or orange or green) boxes.

The third difference I note is in the outlook of the students in the class. Only four out of the 21 students in the class actually started out in Geology, and two of them are attempting degrees in Biology or Physics with Geology as the second major. Others have come from Engineering, Chemistry, Computer Science, History and Environmental Science, as their impressions of what they might do with their degree have evolved over the years since Frosh Week. Three of them are also transfer students from technical programs in Ontario, where they have identified the need for a degree in Geology as beneficial to their long-term prospects. These people have put a lot of thought and planning into their schooling and are well into the stage of investing in a career. Not all are destined to jobs on the mine site, core shack or high rise tower in Calgary – some are looking to grad school, some to teaching, some to business, and some even to professional sport as a career, but I think all of them see their education in Geology as a vital step along the way, and at least a viable fall-back should their dreams not work out. I am sure students 30 years ago had many of the same dreams, but it seems to me that the commitment to the subject has intensified. Maybe it's something to do with the cost of it!

I could identify other differences – hair styles are definitely shorter, ball caps seem to have had their day, and clothes are even more casual. However, some things haven't changed much at all – whether you studied with George Stevens, Alan Macdonald, or another professor, Structural Geology still marks an important transition in geological education. For some, it is the recognition that Maths and Physics have some relevance to rocks; for others it involves the first real insights into thinking and graphing in three dimensions, and it's not necessarily the student who always gets an A who is the one who really grasps it. I hope all students discover that Geology is more than just facts about the Earth, and that their understanding is stretched by the course. And of course, the whole class now has a new tool in their kitbag – anyone found an app for stereonet plotting yet?

Rob Raeside

HAPPENINGS

The department has been a busy place through 2011. With over 120 students studying either Geology or Environmental Science, there is always something on the go. Here is a selection of the highlights from the year.

The first big event was the annual colloquium of the Atlantic Geoscience Society, this year in Fredericton. Fifteen students and five professors participated, with several of the graduate students taking a workshop on laser ablation ICP-MS analysis, run by the Quartermain Centre at UNB. They were introduced to the technique and in live time were able to watch pits being ablated and analyses made. Most of the undergraduate students stopped off at Sussex on the way to the conference and visited the PCS potash mine, exploring the 80 m high underground caverns. Graduate student Ravinder Pannu won the Sandra Barr Award for best graduate student presentation, for his paper entitled "A Laboratory Method for the Quantification of Mercury and GHG Volatilization from Soils."

Over the February study break graduate student Sara Akin participated in a field course in Trinidad. As part of a Petroleum Field Methods course, led by Dr. Grant Wach from Dalhousie University, she traveled to Trinidad to view the petroleum operations there, focusing on clastic sedimentology (deltaic deposits), sequence stratigraphy, and reservoir characterization. Daily exercises combined outcrop and well log data to facilitate discussions with peers, geologists and engineers from Petrotrin and Ten Degrees North.

We were pleased to host two "visiting" speakers in the winter term – both as part of the APICS/Atlantic Geoscience Society tour. Yana Fedortchouk from Dalhousie visited in January, to discuss "Diamonds: window in the Earth's interior" and because he is right here we prevailed on Peir Pufahl to tell us about "Bioelemental Sediments and the Precambrian Earth", the other half of the APICS/AGS speaker series.

March is honours thesis production month, during which three Geology theses and four Environmental Science theses were wrapped up. Topics ranged from chemistry of duricrusts in Chile to petrology of dykes in Cape Breton Island and sedimentology of ironstones in the Annapolis Valley, and to lake levels and water quality in small lakes on the South Mountain.

Following exams, and the largest crew at second year field school in nearly 30 years, graduation day loomed, where amid the celebration, goodbyes have to



Group photo of Field School at Arisaig

be said too. A total of 27 students graduated, 5 with MSc degrees, 8 with Environmental Science degrees, and 14 with Geology degrees.

During the summer two of our faculty received special recognition. Linda Lusby, professor of Environmental Science retired this year, and was recognized by the usual methods and by the award of the *Campus Environmental Leadership Award* by the Environmental and Sustainability Studies (ESST) Student Society. An environmental lawyer, Professor Lusby has taught at Acadia since 1983, and was the first professor in the Environmental Science program, when it was established in 1995. She also served for one year as Head of the Department of Earth and Environmental Science when it was formed in 2007.

At the annual meeting of the Geological and Mineralogical Associations of Canada in Ottawa, Sandra Barr's service to the Canadian geoscience community was acknowledged when she received the Distinguished Service Award from the Geological Association of Canada. Sandra is a long-standing member of the GAC, which she joined in 1970 when she was still a graduate student at the University of



*Sandra
acknowledging
receipt of the
Distinguished
Service Award
from the GAC*

British Columbia. She reached the highest role in the Association by serving as President in 2004-2005. Under her leadership GAC explored new relationships within the Canadian geoscience community, which led to the creation of the Canadian Federation of Earth Science. She is currently special advisor to the GAC President and also serves as GAC's Book Editor. In that role she has brought a number of important projects to fruition, such as the latest edition of the highly successful Geotext "Facies Models". The award also acknowledged Sandra's many other roles in geoscience, including her service as editor (since 1986) of the journal "Atlantic Geology".

The fall term has been especially busy, with a particularly active Fletcher Club, organizing visits and field trips to Cape Split, the Parrsboro and Joggins area, the Ovens caves and gold deposit, and occasional movie nights, and other social events to while away the hours better spent studying...! A major event is always the AUGC, this year in St. John's – the event was likely the largest AUGC ever, with about 180 students in attendance, and Acadia students took top awards in both the oral presentations and poster classes. Dewey Dunnington, an honours student in Environmental Science, won the Science Atlantic best paper award for his presentation on Late Holocene environmental change in lakes near the New Brunswick-Nova Scotia border and Mariella Nalepa, an honours student in Geology won the best poster award for her work on the form and age of the Bloody Creek Crater, near Bridgetown, NS.

The department was honoured to host the 33rd



Paul Hoffman beside Charles Huggins

Huggins Science Seminar, inviting Paul Hoffman, variously from the Geological Survey of Canada, Harvard University and the University of Victoria. He gave a riveting lecture on the Snowball Earth to a mixed audience of about 150 in Huggins Science Hall, and a thoroughly researched lecture on the 19th century Diluvian Controversy to the department.

Other speakers in the fall term included Rob Pearson (Acadia grad, 2004) and Geoff Say from RPS Energy, Calgary, who gave a much appreciated review of the job of the wellsite geologist. Catherine Reid, from the University of Canterbury, New Zealand, spent a month in the department working with Peir Pufahl, and provided a fascinating insight to life in Christchurch, NZ, during and after the earthquakes. In November, Brad Hayes, the CSPG Outreach Lecture Tour speaker gave a lecture on Unconventional Gas and Oil Development, a very timely topic in the Maritimes given the recent public reaction to possibility of hydrofracking as a production tool in oil shale.

Much excitement in the department surrounded the football season this year, with three students in the program on the team, and the team progressing to win the Loney Bowl against rivals St. Mary's in November in Moncton.



The joyous team after winning the bowl. We think there are some geologists in there.

Lots more detail about these events and more photographs to accompany them can be seen on the department's web pages at <http://ees.acadiau.ca>.

FACULTY AND STAFF NEWS

Sandra Barr passed a milestone in 2011 when she received recognition for 35 years of service at Acadia. This award affirms without a doubt that she is the “old fogey” in the department, although her colleagues have probably been aware of that for some years now! Sandra continues to teach the two introductory geology courses and igneous petrology, as well as the tectonic part of the structural geology course and parts of what is now “Global and North American Geology” and the two field schools. In recognition of the fact that she has to stop teaching sometime down the road, she is cutting back on her graduate student numbers, having had a record number of students (5) complete their MSc theses in 2011. In mid-March, Sandra travelled to Pittsburgh, Pennsylvania, for the combined meeting of the Northeastern and North-central sections of the Geological Society of America. She co-authored three presentations at the meeting as well as co-chairing a session on “Devonian orogenesis in the Appalachian-Caledonian mountain belt”. She was also busy at the annual GAC-MAC meeting in May in Ottawa, where in addition to her scientific presentations, session-chairing duties, and GAC-related activities as presidential advisor and book editor, she also was co-leader of a 5-day post-conference field trip across Ganderia in New Brunswick. Her research work continues to thrive, with field work in southern New Brunswick, Antigonish Highlands, and eastern Meguma terrane occupying much of her summer, although she took time for a quick trip to Oxford, England, to visit son Colin and family, which included a side trip to see whether or not the Meguma terrane really extends to Wales (looks like it might!).

Sandra was appointed to the J. Austin Bancroft Chair of Geology this year. Prof. Bancroft was the professor of Geology for many years early in the 20th century, and endowed both a chair and scholarships for students in Geology.

Lynn Graves continues at the helm in the department office, ensuring students get into courses they want (or need!), filing papers and maps, and generally keeping the place going. She relishes her long weekends at the shore in Big Island, and trips to visit her daughters and grandchildren, all of whom now live in Winnipeg.

Linda Lusby retired from teaching in June, after teaching at Acadia for 28 years. She continues to live in Wolfville with a pack of Labradors and greyhounds and what sounds like an ever-expanding garden. Any

time we meet her on the street or around campus, she is always quick to assure us she is enjoying her retirement immensely.

David McMullin continues in his largely teaching role. In the winter David continued to teach the labs and paleontology portion of the lectures in Earth History (1023). This was the second year for GEOL 2043, the new Petrology and Stratigraphy course and for which David teaches the labs. It seemed to run more smoothly. David once again took on Metamorphic Geology (3503), his area of specialization. The course continues to grow and change as David makes it his own. The spring saw his usual involvement with Field Methods, which is now a credit course. With 24 students, this was the largest enrolment in Field Methods since the 1980s. Even with huge enrolments in the fall, there is a continuing demand for an intersession Natural Disasters class, which started the day after Field Methods finished. In the fall he continued his involvement in the intro labs (1013) and co-taught Natural Disasters with Ian Spooner. Students seem to appreciate the quite different styles and we had the largest class ever, 283! On the research front, David’s doing some collaboration with Sandra on some peculiar low pressure metamorphic rocks from Kelly’s Mountain, Cape Breton Island.

Nelson O’Driscoll was promoted to Associate professor this year. As director for the Center for Analytical Research on the Environment (CARE) he supervised the training of many students and collaborated with St. Francis Xavier University and Memorial University through the shared NSERC CREATE graduate program. Graduate student Samuel Edmonds graduated as did two honours BSc students (Amy Buckland-Nicks and Amy Larkin) with theses examining mercury accumulation in invertebrates and songbirds. Nelson welcomed two new PhD students (Erin Mann and Lili Arsenault) both of whom are examining mercury cycling in the Arctic in collaboration with Mark Mallory at Acadia and researchers at UNB (Karen Kidd) and Memorial University (Susan Ziegler) funded by the Northern Contaminants Program. Nelson also was involved with the Global Mercury Conference which took place in Halifax this past summer and has a new book on mercury published this Christmas by John Wiley and Sons.

Don Osburn is still very busy making thin sections and generally looking after our rocks. He now manufactures material for external clients, and is doing his bit to keep the university financially afloat. However all good things must come to an end, and rumour has it he is seriously considering retiring this year.

Peir Pufahl is currently on sabbatical leave and is busier than ever! He spent time last summer in Brazil with colleagues from the Geological Survey of Brazil studying phosphorites. He was back there in September to deliver a keynote address on economic phosphorite at Gondwana 14. In addition to his travels he's also been busy with his students and postdocs, as a co-editor of the journals *Sedimentary Geology* and *Marine and Petroleum Geology*, and touring Atlantic Canada as the Atlantic Geoscience Society's Distinguished Lecturer. Peir leaves for Perth, Australia, in January for seven months where he will work with the Geological Survey of Western Australia investigating Paleoproterozoic iron formations. Sara Akin, one of Peir's M.Sc. students, will defend her thesis on one of these Australian iron formations in April. Way to go Sara! Peir also led a great group of 12 students on his short-course on modern and Pleistocene carbonate sediments of Bermuda last May. He looks forward to leading this course again in May 2013. Alumni are welcome to join the course! Please contact Peir for details.

Rob Raeside continued this year as department head, ensuring classes get taught, money gets spent (or should that be saved?), and students get into (and out of) their courses. He is increasingly involved on the national scene with the Council of Chairs of Earth Science Departments, and authored a paper on student enrolment, retention and job prospect trends at a special session at the AGU meetings in San Francisco (unfortunately he didn't get to go there this time!). He has also spent the year as chair of Science Atlantic, formerly APICS, the regional group that oversees many of the student conferences in the Atlantic provinces, as well as other initiatives to ensure networking and collaboration among the universities.

Most of his travels were administrative year, with trips to Calgary and Ottawa to attend meetings of the heads of Environmental Science and Earth Science programs, and to Sydney, Moncton and Halifax on behalf of Science Atlantic. He did manage to take a week in summer to visit Baltimore and Washington and attend the International Congress of Vexillology.

Rob was appointed as Edwin King professor of Geology this year, named after the prominent Nova Scotia lawyer and graduate of Acadia in 1863.

Ian Spooner has been working with Hilary White (M.Sc. Geology) and Dewey Dunnington (B.ScH ENV5) on lake projects in the Amherst-Sackville region. Ducks Unlimited has been a supporter of this research though they really did not see many ducks during the summer! Hilary and Dewey are both investigating environmental change in coastal wetlands using lake sediment records and spent over a month at the Beaubassin Field station in Aulac doing field work. The highlight of the summer (for Ian at least) was constructing a raft using canoes, a Zodiac and a bunch of plywood then anchoring the raft in the middle of the lake and collecting core samples. They made a video of the work, you can check out at <http://www.youtube.com/watch?v=KrV-kgLokX0>. Dewey presented his research at the Atlantic Universities Geoscience Conference in October and won the best paper award, and he successfully defended his thesis in early December! Ian has also been working with Allison Healy and co-supervisor Dale Hebb (Kentville Agricultural Station) conducting honours research on nutrient loading in small streams in the Thomas Brook watershed near Aylesford, NS. Allison successfully defended her thesis in December.

Ian continues to tackle problems associated with the Bloody Creek Crater south of Bridgetown. He works with Peter Williams (Dean of Science) and Mariella Nalepa (B.Sc. Hons) trying to figure out how such a geometrically pristine crater ended up on the South Mountain. Mariella presented her preliminary research at the AUGC and won best poster award.

This coming summer Ian hopes to head back to northern British Columbia to retrieve some instruments installed in lakes in 2005; hopefully they are still there. Oh yes, and maybe collect a few lake records along the way!

Cliff Stanley continued his evil ways at Acadia this year, teaching Economic Geology in the Winter Term and Mineralogy and Geochemical Material Transfer in the Fall Term. He also continued his lithogeochemistry research in Chile, and is co-supervising several Chilean MSc students working on a number of porphyry copper deposits there (at the Universidad de Chile with Dr. Brian Townley, at Universidad de Catholica del Norte with Dr. Eduardo Campos, and at UBC with Dr. Craig Hart). This summer, Cliff will commence supervising his own Chilean MSc student, Paula Brunetti, who will

come to Acadia to study the Relincho porphyry copper deposit.

Last summer, Cliff commenced lithogeochemical research studying the weathering profile of the Bisha volcanic hosted massive sulphide deposit, and is supervising BSc honours student Kacper Halama, who is undertaking an X-ray diffraction analysis of weathered samples from this deposit. In August, Cliff travelled to Finland for the International Applied Geochemistry Symposium with MSc student Biniam Bisrat. There Cliff presented three talks on sampling errors, lithogeochemistry, and deionized water as a partial digestion, and Biniam presented the results of partial geochemistry experiments from his thesis, which he successfully defended the following month.

During the summer, Cliff also began a modelling exercise, attempting to thermodynamically predict the chemical behaviour, speciation, and oxidation and buffering potentials of the common geochemical digestion aqua regia (royal water). This project has involved collaborations with the Pasadena Jet Propulsion Laboratory (who have provided some of the necessary thermodynamic constants), and the use of a multi-CPU supercomputer cluster used to derive additional thermodynamic constants from first principle quantum equations.

Finally, Cliff has initiated a research project to be conducted at Nova Scotia saddle reef gold deposits, testing several modifications of methods used by the Chinese Geochemical Survey to obtain reproducible and representative determinations for gold in geochemical surveys. These methods have the potential for avoiding the nugget effect, a source of variability in gold analyses that makes it very difficult to recognize gold anomalies in geochemical surveys.

GRADUATE STUDENTS

Graduate student enrolment was at record levels this past year with up to 12 students registered in the program. Through the year we enjoyed a steady stream of thesis defences as many of them finished up – always a very satisfying aspect of the process, no matter how nail-biting the defences may be! Students who finished their graduate studies in 2011 were:

Pizye Nankamba: Metallogeny and environmental geochemistry of heavy metal mineralization in the Horton Group, Windsor, Nova Scotia; *supervisors: C. Stanley, E Kosters.*

Jean-Luc Pilote: Petrology, petrogenesis, economic potential and tectonic implications of the Landry Brook

and Dickie Brook plutons and Charlo Plutonic Suite, northern New Brunswick, Canada; *supervisor: S. Barr.*

Robert Treat: Structure and petrology of the Partridge Island block and its role in the tectonic evolution of the Saint John area, New Brunswick; *supervisor: S. Barr.*

Matthew Tucker: Geology and mineral occurrences in the Faribault Brook area, Cape Breton Island, Nova Scotia; *supervisor S. Barr.*

Biniam Bisrat: Monitoring leaching conditions during partial digestion geochemistry; *supervisor: C. Stanley.*

Feseha Tesfai: Petrology and Ti-P-V potential of the Lower Coverdale Plutonic Suite, southeastern New Brunswick; *supervisor: S. Barr.*

Donnelly Archibald: Field relations, petrology, and tectonic setting of the Ordovician West Barneys River plutonic suite, southern Antigonish Highlands, Nova Scotia; *supervisors: S. Barr, JB Murphy (St. F.X.)*

Continuing graduate students and their projects are:

Sara Akin: Evolution of the Earaaheedy Basin: a paleoceanographic and sedimentological framework for Paleoproterozoic iron formation, Frere Formation, Western Australia; *supervisor: P. Pufahl*

Ronald Massawe Lithogeochemistry of the Bisha Volcanic-Hosted Massive Sulphide Deposit, Eritrea; *supervisor: C. Stanley.*

Raya Puchalski: Petrology of the Trafalgar Plutonic suite, northern Meguma terrane, Nova Scotia; *supervisor: S. Barr.*

Hilary White: Evolution of the Tantramar Marsh: a paleolimnological perspective; *supervisor: I. Spooner.*

Louis Zsamboki: Geophysical modeling in the Cabot Strait between northeastern Cape Breton Island, Nova Scotia, and southwestern Newfoundland, Canada; *supervisors: S. Barr, S Dehler (GSC-Atlantic)*

HONOURS STUDENTS

Three graduating students submitted their honours theses in Geology in the spring of 2011. **Leah Chiste** worked with Cliff Stanley on the geochemistry of pediment over the Toki Cluster porphyry copper deposits, Atacama Desert, Chile; **Jon Gates** worked with Sandra Barr on the petrology and tectonic implications of mafic to intermediate dykes in the Kellys Mountain area, Cape Breton Island, Nova Scotia; and **Luke Marshall** studied the sedimentology and authigenesis of the Lower Devonian Torbrook Formation Ironstone, Torbrook, Nova Scotia, with Peir Pufahl. In addition two students working with Ian Spooner completed theses in Environmental Science: **David Terry**, on the effects of water level fluctuations

and sediment resuspension on water quality at Tupper Lake, Nova Scotia; and **Dewey Dunnington** on the tracking Late Holocene environmental change in the Missaguash Marsh, Nova Scotia-New Brunswick border.

B.Sc. Honours theses still in progress this year are:
Kacper Halama: XRD Study of the Weathering Zone of the Bisha Zn-Cu-Au Volcanic-Hosted Massive Sulphide Deposit, Eritrea. *Supervisor:* C. Stanley.
Amy MacFadzen: Petrology of the Indian Lake Pluton, Antigonish Highlands, NS. *Supervisor:* S. Barr.
Mariella Nalepa: Investigation of the Form and Age of the Bloody Creek Crater, Southwestern Nova Scotia. *Supervisors:* I. Spooner, P. Williams.

FLETCHER GEOLOGY CLUB

The Fletcher Geology Club enjoyed a very active year. With the financial assistance provided by the Logan Grant offered by the GAC, the club sent twelve students to the AGS meeting in Fredericton, and ten students to the PDAC conference in Toronto in March. Such activities are good for establishing contacts and seeking summer jobs.

In the fall term, the club has organized academic and social events. In October, a group of students attended the annual Atlantic Universities Geoscience Conference (AUGC) hosted by Memorial University in St. John's. Ten students attended (three presenters and two posters) and were successful in promoting themselves and Acadia by winning Best Paper Overall, Best Poster, and club with Best Spirit, as well as an iPad sponsored by the CSPG. Several club members attended the Geology Matters conference held annually in Halifax. The club intends to continue its successes in the winter term at the AGS conference in Moncton on February 2012 as well as next year's AUGC at Dalhousie.

Social events promoting geology are a very important aspect to the club's success. We enjoyed hikes, movie nights, and dinner events. The most notable and successful event this semester was the Parrsboro-Joggins Geology trip in late September.



Twelve students and one professor attended the weekend long trip which was planned and organized by the Fletcher Club with help of faculty and curators of the Bay of Fundy Geological Museum and Joggins Fossil Centre. Additionally, the club annually hosts a Christmas Dinner Potluck in December as well as a Year-End Department Banquet. These were very successful events with about 50 students and faculty attending this year from throughout the department. These events also include live music played by students of the club.

Some community events that the club has been involved with include assisting the Canadian Blood Services with set-up and take-down as well as serving refreshments during their annual blood drive. This is hosted in both winter and fall terms and gets participation by both students and faculty. In November several members of the club attended a Salvation Army Pioneers Club meeting where they displayed rock samples and fossils. Attending children were encouraged to earn their 'rock badges' by bringing their rocks and have the club identify and describe their rocks and learn a little about what formed them and what use they are to humans.

Kacper Halama, president

ACADIA STUDENTS WORK THE MUSEUMS

For the past couple of summers (and several times over the years) Acadia students have worked as summer or coop assistants at the Joggins Fossil Centre and the Parrsboro Fundy Geological Museum. We were privileged this fall to have two students, Christiane Theriault and Andrew Fage, lead us on a Fletcher Club field trip to these locations, and I asked them to record their experiences in the museums.

Last summer, I worked as a Seasonal Interpreter at the Joggins Fossil Institute. The Joggins Fossil Cliffs, which are managed by the Institute, are a UNESCO World Heritage site. The institute aims to not only educate people on the amazing site, but also to protect it. As a ‘Bilingual Seasonal Interpreter’, I led the 30-minute Logan and the two-hour Lyell beach tours, both in English and in French. For these tours, I took the visitors down the stairs and on to the beach — but not before making a pit stop outside the Institute to note all the building’s green features! Once on the beach, I was able to show and teach the visitors about some of the amazing fossils found in the Joggins Fossil Cliffs, as well as familiarize them with why the cliffs are the best example of Carboniferous fossils in the world.

Aside from leading tours on the beach, as well as other side tasks, I also led gallery tours where I could excitedly enlighten visitors with knowledge on the various fossils found in the gallery, including a fossil of the world’s first true reptile—*Hylonomus lyelli* which was home for a visit to Joggins this past summer!

The Joggins Fossil Institute is an excellent place to visit, especially if rocks and fossils are an interest to you. I am delighted that I got the chance to work in a place where the experience turned out to be so positive and rewarding. I received a considerable amount of hands-on experience working at the Institute, especially when one is able to work with some of the best fossils from the Carboniferous Period in the world! It’s one thing to read about fossils and see images of them, but it’s another thing to actually be able to work with them—to hold them in your hands and truly observe them for yourself. Working at the Joggins Fossil Institute, one attains many skills. You learn how to be patient, how to work in team environments, how to interact with and speak to the public, how to manage your time, and many more. Working at the Institute really opened my eyes to Geology, and made me realize how I truly enjoy and appreciate it. I started working at the Institute as an Environmental Science major, and



ended the work term with a switch to Geology. I am certain that Geology is the right field for me, and working at the Joggins Fossil Institute definitely helped me realize this. I learnt so much working there, and I will never forget the great experience, nor the amazing people I met along the way!

Christiane Theriault

For the past two summers, I worked as an Interpreter at the Fundy Geological Museum in Parrsboro, N.S. In this position I was able to do many different things, one of the best was leading tours to different beaches around the Parrsboro area. Another task that often came up was to provide educational programming to children when they came to the museum on school trips, teaching them about geology, as well as the fossils found in the area.

This job was incredibly rewarding and afforded me an opportunity to learn about the geology of my own backyard, taking me to different sites all over northern Nova Scotia. It also allowed me to meet and talk to many different people from all walks of life, and gave me an opportunity to educate them on the geological, social and economic histories of the area. Of course, when you meet so many different people, some of them are bound to educate you as well.

Andrew Fage

WHERE ARE THEY NOW?

John Gardiner

Each year we ask a graduate to write an article on his/her past and current activities since leaving Acadia. This year we feature John Gardiner, who studied at Acadia from 1992-1996 as a MSc student.

Hello! My name is John Gardiner, and I'm happy to be featured in the Acadia Geology Alumni newsletter! Though I live far away now, in Denver, Colorado, it's nice to reconnect with my alma mater. I am currently President/CEO of a junior mining company and my wife Lyda, also an Acadia graduate, is a Director of Nursing Informatics working in the computerized health care business. Needless to say, the two of us see a lot of travel each year, across the United States, Canada, and around the globe. In these travels I have found that working in the exploration business is never an easy task. It always seems as though a thousand obstacles stifle the geologists' every path. Despite this difficulty, inspiration and courage can be found in unlikely places.

After graduating from Acadia in 1986, I took a job at Noranda's Cu-Zn GECO Mine in Manitowadge, Ontario. I started with geological work, eventually expanding to oversee ore reserves and grade control computerization. Soon after, I moved to Val d'Or, Quebec, and worked at the Sigma Gold Mine, where I got my first real introduction to exploration, drilling a number of gold properties in Quebec. Placer Development merged with Dome Mines and I became an employee of Placer Dome Inc., a company that I would spend much of my career with. After discovering how bad my drillers' French really was, Placer moved me to Timmins where I managed exploration in Eastern Ontario around the Dome Mine and Detour Lake Mines. This was a particularly rewarding part of my career where our geologists made strides in finding deposits around the Dome and Detour Lake Mines – some geological, and some through carefully-crafted alliances with mine managers who did not want to see exploration move out of their control. It was here that I learned the savvy exploration geologist must often juggle concepts outside of their area of expertise. Diplomacy and compromise can make all the difference between successful exploration and total failure.

After a couple of years in Timmins, my wife and I were sent to Denver - where I managed the exploration activities for Placer Dome Inc. Since my new responsibilities included nearly all of the country, it was a great opportunity for me to get acquainted with multiple states looking at prospective ore deposits. This was the first time that I had really worked in rocks that weren't Archean or Proterozoic



in age, giving me a chance to fully use what I'd learned at Acadia. Our son Thomas, who is now a junior at Daniel's Business school at Denver University was born here in 1992. Eventually, I saw myself spending a lot of time working in Nevada, meaning I could get involved with exploration around some of the biggest gold mines in Nevada, including Cortez, Pipeline and Bald Mountain.

Later, I got invited to work with Placer's Corporate Development group in Vancouver, and I was part of a team of people that traveled to ore deposits in Russia, Brazil and the United States to evaluate mining opportunities. Placer Dome Inc. was arguably one of the best companies to do this with and I learned from a number of professionals that specialized outside of the more scientific aspects of the geological world – and this warranted learning the nuances of cash flows, taxation, metallurgy, political risk – and most importantly the ability to fully utilize the “expertise” that surrounded me.

After doing this for a couple of years I moved to Toronto and worked for Cameco Corporation where I was the Exploration Manager for North America for their gold division. Shortly thereafter, I decided it was time to return to Colorado and undertake my own adventure, and I worked for a number of companies doing consulting work in Mexico including Placer, Bema Gold and others.

Not long after returning to Colorado in 1999, I teamed up with a group of people and we started a junior exploration company called Taranis Resources Inc. Taranis has a long history of doing exploration in the United States, Canada, and Finland - and it is

presents the biggest challenge of all – trying to integrate everything that I had learned to find an economically viable deposit. Today, most of our exploration activity is focused on Finland, and I find I have developed a special admiration of the Finnish national character.

Finland is an extraordinary country – it has only 5.4M people, and has a long history of mining and exploration, most notably through the famous Outokumpu Mining Company. It is worth noting that Finland’s government and culture have shown great tact in recent years; Finns are exceptional when it comes to balancing conservation and respect for the land with respect for the needs of industry and progress. Historically, Finland is perhaps the most interesting of any country where I have worked, and it has parallels to the careers of the exploration geologist – the fight against the odds.

During WWII, Finland was involved in two major conflicts with the Russians – both of which saw the sovereignty of Finland threatened. The Soviet Union was confident that it could overrun Finland in just a matter of weeks, and much of the world was also convinced that Russian rule of Finland was all but a *fait accompli* to their Baltic expansion. The Finns thought otherwise, but were outnumbered by the Russian soldiers 20:1, with antiquated military hardware and few places to run if necessary. Russia repeatedly tried to attack Finland, but was turned-back time and time again – and Finland kept its

sovereignty. Against all odds, the “Plucky Finns” had thwarted the Russians through resourcefulness, determination, cunning, and above all else – confidence in themselves.

Much like an exploration geologist, the most important thing for Finland was to be convinced of their cause – to really believe in what they were fighting for. The Finns knew the odds, and they knew what would happen if they lost the war. To put it simply, it was this knowledge, combined with a willingness to negotiate and compromise (the war could not be fought forever, the Soviets ended up annexing portions of Eastern Finland in exchange for peace) that saved Finland from destruction at the hands of a much larger force.

In your career as an exploration geologist, you too will be the underdog just as Finland was 70 years ago, and your job is getting even harder as the number of ore deposits near surface have all been found or mined. However, we can all learn from the Finns that sometimes having the “biggest army and most equipment” is not the deciding factor in the end – it is the ability to make use all of the knowledge that you can obtain, to think critically and differently, and the determination to pursue something against “all odds” that hopefully leads us to the next big ore deposit!

John Gardiner,
Taranis Resources Inc.

KEEPING IN TOUCH

If you have an item of interest, or any news of your activities (or those of your classmates), please let us know. We will try to incorporate as much as possible into future newsletters. Send details to Dr. Barr or Dr. Raeside at the Department of Earth and Environmental Science (sandra.barr@acadiu.ca, rob.raeside@acadiu.ca).

Jillian Bambrick (BSc 2004) and **Barry Banks** (BSc 2004) were married in the Manning Chapel on May 21 of this year – just hours after Cassie Gaudet and Rob Lodge were married in the same venue! In attendance were **Jason Hines** (BSc 2003), **Melanie Sampson** (BSc 2003), **Corey Curl** (BSc 2004), and **Erin (Oickle) Carr** (BSc 2004). Barry is surveying offshore for C&C Technologies based out of Lafayette Louisiana (although this year he spent most of the year offshore Africa), and Jill just finished her first term as a PhD student at Louisiana State University in Baton Rouge.

Bob Barter (BSc 1997) organized a Wolfville mini-reunion at the end of August. **Jason James** (BSc 1998) and **Mike Mitchell** (BSc 1997) came from Calgary. **Karen** (BSc 1998) and **Scott Lister** (BSc Environmental Science 1997), **Maylia Kempf** (BSc

1996), **Charlie Jessome** (BSc 1990), **Jim Hunter** (BSc 2001) and **Jen Shynal** (BSc 1997) were also coming by. Bob stopped by the department to say hello. He writes “I’m trying to get my kids hooked on the idea of going to Acadia before my wife convinces them on the merits of Guelph.”

Tim Cross (BSc 2008) has returned to earning a living in Geology, by taking up a position as a geologist with Rio Tinto in Perth, Australia. He dropped by with Kathryn and daughter Eden before departing in November.

Peter Dalton (BSc 2004) was encountered looking after the display booth for Erdene Resource Development at the NSDNR “Geology Matters” conference in Halifax in late October. Peter continues to travel to Mongolia to look after projects there. He was lament-

ing how much he has forgotten about his microscope petrographic work – maybe he needs a refresher?

Andrew Daniels (BSc 1985) was appointed North Atlantic Resources Limited project development manager, working in resource evaluation and mineral exploration in lateritic terrain.

Jon Gates (BSc 2011) was last heard from looking for gold in Nunavut on Agnico Eagles Meliadine property. He wrote that things were going well – not sure if that means he found some gold?

Osas Izebokun (BSc 2010) worked a stint in the petroleum industry in Alberta, but finally returned to Northern Gold Mining, Inc., in April, working in Ontario.

Mario Justino (MSc 1991) was appointed as Vice President Exploration for Lakeside Minerals Corp. in March. He has worked as a mineral exploration geologist across Canada and in Finland, Sweden, French Guiana, and in Portugal.

Jason MacKenzie (BSc 1996) has been pursuing single crystal growth of compound semiconductors for the past bunch of years at Redlen, where he has now been given a role in technology transfer. He is responsible to transfer and/or evaluate crystal growth improvements and, if beneficial, formally transfer these improvements to manufacturing.

Kelly Mahoney (MSc 1996) is a Senior Mining Advisor for the Government of Northwest Territories.

Tamara Moss (MSc 2010) wrote that the day after spring 2010 graduation she started a contract position with Teck Resources Ltd. in gold exploration near Sioux Lookout, Ontario. The majority of the work included prospecting, reconnaissance mapping, whole rock, soil, and bark sampling. She passed the Professional Practice Exam in the spring of 2011 and has recently taken a position with Mercator Geological Services Ltd. working out of a drill camp on a 28 days on and 10 days off rotation from Fermont, Quebec. Her short term goals are to be a registered Professional Geologist (needs more year of work experience for Nova Scotia) and to buy a condominium with her boyfriend Justin in the north end of Halifax.

Erin (Oickle) Carr (BSc 2004) is manager of interpretation and reporting at Canada Seabed Resources, Ltd., Porters Lake, NS. She is still heavily involved with most of the projects here, but is no longer working in the field. She writes that life is good and her son Mackenzie is now 3. He loves cars and trucks, and hates bugs.

Robert Lodge (BSc 2005) and **Cassie Gaudet** (BSc 2010) were married in Manning Chapel in May. Rob is working on his PhD at Laurentian University, and Cassie is working on a BSc in Psychology.

Perry MacKinnon (BSc 1982) is active in the exploration business in Nova Scotia and New Brunswick and was encountered at both the NS and NBDNR conferences in the fall. He is chief geologist at NSGold Corporation and has a consulting firm.

Patrick Moran (BScH 2008) is working for Cliffs Natural Resources, and is the mine geologist for their Scully Mine in Wabush, Labrador. Patrick reports that he enjoys the work very much, and living in Wabush is entertaining too. When we last spoke he was in Colorado for a computer course, and that seemed like a good experience too.

Heather (Paul) Barnes (BSc 2002) is living in Falmouth, England and working with IODP (Integrated Ocean Drilling Program), all over the world. She loves her job and life at sea. Her husband is a Cornishman who also works on board the ship as First Engineer. In the early fall, she wrote from berth in Curacao, “a beautiful spot”, due to sail on EXP 336 (off Barbados). She runs the XRay Diffraction laboratory onboard, but alternates between this lab and as the Assistant Laboratory Officer position. During the past 6 years she has been all over the world onboard this ship: India, Antarctica (most amazing expedition ever!), Japan, Singapore, Victoria, Panama, Tahiti, Guam, Hawaii...

Joalan Pinto (BSc 2010) has been working for Northern Gold Mining Incorporated, in Kirkland Lake, Ontario, doing core logging, drill supervision, setting up and terminating drill holes, geological mapping and chip sampling.

Matt Stokes (BSc 2002) was practicing real estate law in Halifax when he got an offer to take over the management of a property development company in Edmonton (Endurance Equities Corp.), developing and re-developing commercial retail real estate in towns all over Alberta. It’s been an interesting career move, but he writes that he couldn’t be happier about it. “Edmonton is also a great spot to keep an eye on the oil and gas industry in Canada. There’s always something going on from either a political, economic, engineering, environmental or geological point of view.”

Stuart Venables (BSc 1999) is a petroleum geologist with the BC Oil and Gas Commission, and now lives in Victoria, BC.

Robin Westland (BSc 2010) is completing her MSc thesis on sulphate mineralogy, finally achieving synthesis of “the illusive ferric sulphate hexahydrate”, thereby ensuring collection of the necessary data regarding atomic structure, etc., for her thesis. She writes, “I have certainly felt greatly relieved about that! I am quite set on being done by April of 2012 and then headed off to Peru! I actually won a trip back to the same Amazonian lodge where I volunteered for three months in 2004. What a miracle! I plan to spend a week in Lima, as well, visiting with mining offices, specifically with SNC Lavalin, to see if I can find myself a job cleaning up mine waste. Wish me luck!”

Judy White (Pilgrim) BSc (1983) is a Corporate Strategist in the Policy, Planning and Support Services Branch of the Nova Scotia Department of Natural Resources. She leads the Secretariat responsible for the implementation of "The Path We Share - A Natural Resources Strategy for Nova Scotia 2011-20". This strategy sets out more than 90 goals and actions relating to biodiversity, forests, geological resources and provincial parks.

Karen (Johnston) Zwicker (BSc 2002) and **Colin Zwicker** (BSc 2003) are still in Redlands, California, where Colin works for ESRI. They have recently bought a house there, but write that they miss the changing Maritimes weather – “LA smog gets old”.

PASSINGS

Jeanette MacNeill, widow of long-time professor (1951-1983) Rupert MacNeill, passed away on August 10, 2011, at age 90. Her obituary noted that donations in her memory could be made to R.H. MacNeill Memorial Scholarship fund at Acadia. This scholarship is awarded annually to the two third-year geology students whose interests provide a strong field work orientation to their programs. It has helped many students over the years and we are grateful to the MacNeill family and friends for their support. For many years after Rupert’s death until her own health prevented her from doing so, she attended the annual departmental banquet and made the award to the students.

James Perry (BSc 1986) died in his sleep on September 20, 2011. According to his obituary, “James graduated from Acadia University a geologist, and was in his heart always a rock-hound who shared his passion with so many over the years.” A second degree from UNB in computer science led to a move to Ottawa and career change that saw him apply that same passion and a puzzle-solving mind with success as a valuable member of the analysis team in Statistics Canada.” Donations in James’ memory can be sent to the Ottawa Mission www.ottawamission.com.