

*Newsletter of the Volcanology and Igneous Petrology Division
Geological Association of Canada*

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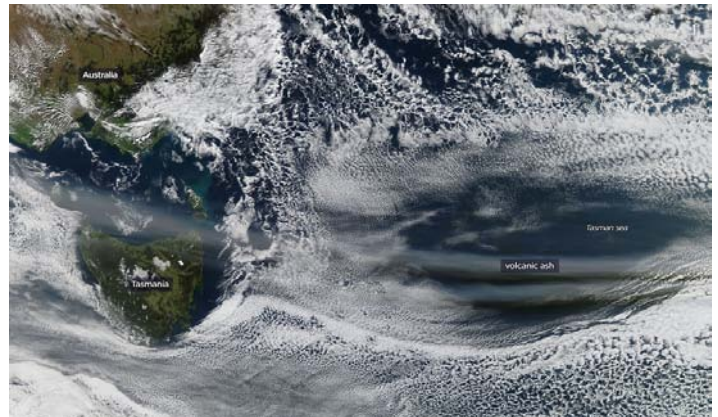
From the Editor

A week or so ago I pulled the spectacular photos below from the web to include in this edition of Ashfall and promptly thought no more about Chilean volcanoes. But now I am writing this editorial from Sydney, where I have been stuck for a few days after the ash cloud from the volcano circled the globe and caused the cancellation of flights into Hobart, my intended destination. Having been stuck in London during the eruption of the Iceland volcano last year, I am starting to feel a little persecuted, but have also been reminded how powerless we are in the face of these eruptions and their ability to impact our lives.

We have recently added an almost complete collection of back issues of Ashfall to the web site. Going back through the years it was interesting to see the constant lament of the editors, as they encouraged the membership to submit material for inclusion. Unfortunately nothing has changed and as you undertake your field work this summer, or participate in conferences and field trips, please consider sharing your experiences with the rest of the Division.

Much of this edition of Ashfall is devoted to this years

Gelinas medalists and Georgia Pe-Piper who received the Career Achievement awards. One of the best aspects of being Secretary for the Division is the opportunity to read the theses submitted each year. The nominated theses this year once again illustrated the outstanding research being undertaken in volcanology and igneous petrology in Canadian universities.



On Monday June 13, NASA's Aqua satellite captured this image of a concentrated ash plume visible over southern Australia and the Tasman Sea



These images from the June eruption of the Puyehue-Cordon Caulle volcanic chain come from the [Daily Mail](#) web site. The photo on the left shows a time-lapse photo sequence of lightning bolts striking around the Puyehue-Cordon Caulle volcanic chain. The photo on the right shows lightning and volcanic fire amid and underneath a towering cloud of ash.



2011 AWARDS

GÉLINAS MEDALS

Every year the Volcanology and Igneous Petrology Division of the Geological Association of Canada presents three medals for the most outstanding theses, written by Canadians or submitted to Canadian universities, which comprise material at least 50% related to volcanology and igneous petrology. A gold medal is awarded for the best Ph.D. thesis, a silver medal for the best M.Sc. thesis and an antique copper medal for the best B.Sc. thesis. Nominated theses are evaluated on the basis of originality, validity of concepts, organization and presentation of data, understanding of volcanology and petrology, and depth of research.

Gold medal - Jonathan O'Neil

This year the Gélinas Gold Medal for the best Ph.D. thesis in Volcanology and Igneous Petrology goes to Jonathan O'Neil from McGill (supervised by Don Francis) for his thesis "The Geology of Nuvvuagittuq greenstone belt and its implications for the Early Earth's evolution". The thesis combines detailed mapping and advanced isotopic studies to generate a model for some of the oldest rocks on the planet and has resulted in a number of publications, including one in *Science*. Congratulations, Jonathan, on a first-rate job. The medal is well-deserved - *Citation by Pete Hollings*



Jonathan's response

I am extremely grateful to receive the Léopold Gélinas Gold Medal and I would like to thank the Volcanology and Igneous Petrology Division of the Geological Association of Canada for awarding me this prestigious honor. My whole Ph.D. has been quite an adventure, a great one, but if anybody had told me when I started, that a couple of years later we would claim that the small piece of land we were mapping in the cold is the oldest remnant of crust on the Earth, I would never have believed it. In fact, I would probably have thought that this person was a lunatic. None of my work would have been possible without the great people who supported me during my Ph.D., so I would like to take a few moments to thank them. I would like to acknowledge the NSERC for supporting me financially throughout my Ph.D. I am also grateful to the generous people of Inukjuak and the people of the Pituvik Landhold-

ing Corporation who helped us with logistics and made our life much easier in the field. A crucial point for the success of a graduate student is to have mentors who believe in them, support them and guide them throughout their research. I am grateful to have had many great scientists who did this for me, but I would especially like to thank the key players who contributed to the success of my thesis: Ross Stevenson guided my first steps as an isotope geochemist and gave me full access to his lab for my Ph.D. research. Richard Carlson welcomed me at the Carnegie Institution of Washington to conduct the critical analyses that became the core of my research. Most importantly my supervisor Don Francis believed in this project, supported me during my entire time at McGill University, and still does today. He never takes the credit that he deserves, but this project would not have been possible without him. Because of him, I am a better geologist and a better scientist. I owe him a big part of the award I am receiving today.

Thank you very much!

Silver medal - Russell Rogers

This year several excellent M.Sc. theses were nominated for the Leopold Gélinas Silver Medal. Unfortunately, the selection committee had to choose only one. The Gélinas Silver Medal was awarded to Russell Rogers of Université du Québec INRS-ETE, who was supervised by Pierre-Simon Ross and Patrick Mercier-Langevin. His thesis is entitled "Volcanology and metallogeny of a sector of the Blake River Group, Abitibi Subprovince, Québec and Ontario". The thesis applies physical volcanology, petrography and whole rock geo-



chemistry to an understanding of the evolution of a Precambrian volcanic pile in the northern part of the Blake River Group and evaluates the potential for economic mineralization using trace element analyses of pyrite from sulphide-bearing horizons. - Citation by Jarda Dostal

Russell's response

I would like to take this opportunity to thank the Volcanology and Igneous Petrology division of the Geological Association of Canada for awarding my M.Sc. thesis this year's Gélinas Silver Medal. I am extremely grateful for this privilege, and am only sorry that I could not be in Canada to collect it in person.

I would like to express my gratitude to my M.Sc. supervisors Pierre-Simon Ross (Institut national de la recherche scientifique) and Patrick Mercier-Langevin (Geological Survey of Canada), for help and support throughout this project. I would also like to thank the Ministère des Ressources naturelles et de la Faune du Québec, the Geological Survey of Canada and Cogitore Resources Inc. for their contributions to this project.



Bronze medal - Steven Flank

The 2011 Bronze Gélinas Medal for the best B.Sc. thesis in Volcanology and Igneous Petrology goes to Steve Flank, Lakehead University for his thesis "The Geology, Petrology and Geochemistry of the Mesoproterozoic Hele Sill, Nipigon, Ontario"

Steve's response

I am extremely grateful to be selected as the winner of the Leopold Gélinas Bronze Medal for best B.Sc. thesis in volcanology and igneous petrology. To be recognized by the GAC is truly an honour, and validates the hard work and thought that went into the completion of my thesis. I would like to thank all those who helped me complete this project. The faculty of Lakehead University's geology department, and especially my supervisor Dr. Pete Hollings, has always been available to help with discussions, questions and revisions. I would like to also thank HTX Minerals Corporation for providing financial and technical support for this project. In particular, Joel Hrominchuk and Grant Moure went out of their way to provide guidance, discussions and revisions that helped me develop this thesis.

Receiving this award shows how important and effective mentorship through summer employment can be. By working with professional geologists as a student I was able to continue to apply what I had learned in the classroom in the field and enhance my education. As the demand for knowledgeable, experienced geologists increases, this type of relationship will become even more important to ensuring highly skilled students are available to enter the workforce.

Receiving this award is a great way to conclude my undergraduate degree and to begin my career as an exploration geologist. As I develop as a professional I hope to be able to reflect the values of the GAC and those who have helped me by acquiring and sharing knowledge and experience with the next generation of young geologists.



From left to right - Jonathon receives his medal from Jarda, Georgia entertains the crowd and Pierre-Simon Ross receives Russell's medal on his behalf.



CAREER ACHIEVEMENT AWARD



The Career Achievement Award is made by the Volcanology and Igneous Petrology Division of the Geological Association of Canada in recognition of career achievements in the field of volcanology and/or igneous petrology. Candidates will be judged on their lifetime scientific contribution

Citation for Georgia Pe-Piper

I wish to nominate Dr. Georgia Pe-Piper of Saint Mary's University for the GAC Volcanology and Igneous Petrology Division Career Achievement Award. She has contributed to nearly 200 refereed articles, mostly in the field of igneous petrology, nearly 50 government publications, one book, and over 150 presentations at conferences, including several invited talks at universities and conferences (recently in Argentina, Canada, Greece, Brazil, China and Japan). Her internationally recognised work has been carried out principally in Greece and in eastern Canada, and can be summarized into six main themes:



1. Her best known early work, and a theme that she has pursued throughout her career, was the origin of the potassium-rich back-arc volcanic rocks (shoshonites) in the Aegean Sea region. Similar rocks are known from other rapidly extending areas of the Earth's crust, such as southern Italy and the western USA. Her 1980 paper on the shoshonites in Lesbos was one of the first papers to provide a modern geochemical understanding of the origin of shoshonites. Her interpretation of the volcanic stratigraphy of the island of Lesbos, based on paleomagnetic reversal chronology, has stood the test of time. Her 1983 paper in the *Journal of Petrology* was the first to clearly demonstrate the importance of mixing of different magmas in the origin of shoshonites: a hypothesis that is now generally accepted for shoshonites and for many arc-related rocks. In a series of papers in the early 1990's, she went against conventional wisdom in the Aegean by arguing that the voluminous shoshonites and related back-arc rocks were related to extension, using arguments based on trace elements, Pb isotopes and the presence of adakitic rocks. This was followed in 2001 by a more comprehensive interpretation, based largely on radiogenic isotopes, of the evolution of different parts of the mantle beneath the Aegean back-arc region. The availability of mantle tomography led in 2007 to a synthesis of the relationship of potassium-rich volcanism to slab tears and slab detachments. The remarkable shoshonite suite in Limnos was used in 2009 to demonstrate the importance of remelting of underplated mafic lower crust in the petrogenesis of shoshonites.

2. Her widely cited 1989 synthesis of the volcanism

Aegean back-arc regions led her to recognise the important role of faults in providing pathways for magma. With Koukouvelas in 1991, she published one of the first papers on granite emplacement in listric fault systems, with the example of the Xanthi pluton. Her detailed mapping and petrological studies of the Cobequid Shear Zone of eastern Canada led to a series of papers (notably in 1998 and 2002) on the relationship of geochemically complex plutons to crustal shear zones. A referee for one of the papers commented that as a result of this work, the Cobequid Shear Zone contained the best known shear-zone granites in the world. The 2002 paper won the David Elliot Prize for a structural geology paper. She applied this Canadian experience to interpretation of the Miocene granites of the Cyclades, clearly demonstrating in 2002 the wrench-fault origin of the Naxos and Delos plutons within a broader extensional detachment faulting system, and the important role of such wrench faults as magma pathways. More generally, her 15 years of work on the igneous rocks of the Cobequid Highlands of Nova Scotia provided an important training ground for more than 30 undergraduate students, resulted in new 1:50 000 maps, and an impressive record of publications on both Neoproterozoic and Devonian-Carboniferous plutonic and volcanic rocks.

3. Her Ph.D. thesis work was on the South Aegean volcanic arc and her later work with Gledhill in 1975 was one of the first studies of Sr isotopes in island arcs and showed the unusual character of the volcanic rocks of the Aegean arc and back-arc regions. She returned to the South Aegean arc more than 25 years later to further develop her ideas on the relationship of faulting to magmatism. This was a highly successful move, resulting in a new understanding of the reasons for the geochemical differences between the eastern and western South Aegean arc (2005) and the importance of faulting in the origin and present distribution of the Kos Plateau Tuff (2005).

4. Georgia is also recognised as the leading expert on the passive-margin volcanism on the eastern continental margin of North America. Her work with Jansa (a stratigrapher) between 1985 and 1994 established the widespread distribution of Cretaceous volcanic and sub-volcanic rocks offshore, their geochemical character and their tectonic significance as resulting from both passive margin tectonic re-activation and from mantle upwelling. Recently (2009), she has used the Cretaceous volcanic record to infer mantle

convection at the transform margin and has explored its implications for petroleum maturation in the Scotian basin. She applied her knowledge of basal Jurassic volcanic rocks offshore eastern Canada to a regional understanding of basal Jurassic volcanism, with a major synthesis paper in 1992, that showed offshore basalts were of limited distribution, contrary to the “broad terrane model” widely held in the US.

5. Her petrographic and geochemical work on volcanic rocks offshore eastern North America led to the serendipitous recognition of the first submarine impact crater at Montagnais, a result published as an Article in *Nature* in 1987 and widely reported in the press. This discovery was very influential in establishing that submarine impact craters can occur, leading the way to the wider acceptance of the role of such impacts in mass extinctions and megatsunamis. As many as six submarine impact craters have now been recognised

6. Georgia’s wide knowledge of the geology of Greece, informed by her experience with rocks in eastern Canada, resulted in the 2002 publication (with David Piper) of a comprehensive book on the igneous rocks of Greece - their geology, geochemistry, petrogenesis and regional tectonic significance. This book was widely acclaimed as the first book to treat the geology of Greece chronologically rather than regionally and as a model as to how to apply igneous petrology and geochemistry to interpret the complex history of an orogen.

In brief, after nearly 40 years of prolific scientific contribution, it is hard to think of a more deserving individual for such an award.

Pierre Jutras

Department of Geology, Saint Mary’s University

Georgia’s response

I am both honoured and gratified by this award. It is an honour to be recognised by ones scientific peers but also a pleasure to have an opportunity to think back on the many colleagues and students whom I have worked with over the past four decades. The name Career Achievement is a bit sobering. Is it an invitation to consider my career complete, or somehow on a downward trajectory? I hope not: there are still so many things to discover, problems to solve, and young people to help in developing their geological skills.

As I reflect on my career, I realise that I have been fortunate in being able to focus on an issue or area for a time and then find completely new challenges in a different direction. I have also been fortunate in the environments in which have worked and the stimulus I have received from colleagues. I did my Ph.D. at Cambridge University at the right time to witness the plate tectonic revolution, in which

geoscientists from Cambridge played a leading role. I also witnessed a revolution in geochemical technology: my thesis work started with classical wet geochemical analysis, but I ended up working with early XRF and microprobe technology. My thesis was on the petrogenesis of the Pliocene–Quaternary volcanoes of the South Aegean Arc and was firmly rooted in field work and an understanding of the chronological succession of lavas. Not that field work was easy in those days for a young women in a conservative country like Greece – I had a hard time convincing local villagers that I was not a German!

When I returned to Greece, I tried to apply what I had learnt in Cambridge at the new University of Patras, where I was appointed as a Lecturer. My department head was unconvinced by the ideas of plate tectonics, but he did appreciate the way I set up XRF and other analytical labs and provided me with funding for field work and leave to visit Canada. I applied the approaches I had used in my thesis to study the Neogene back-arc volcanic rocks of the Aegean. In particular, I worked on high-K calc-alkaline rocks of Miocene age in the island of Lesbos, which I recognised as classical shoshonites, and this work was written up as a dissertation in order to gain promotion to Reader. I also broadened my experience by working on rift-related volcanic rocks of Triassic age throughout Greece, attempting to determine if they represented a classic rift or back-arc volcanism. This early work made me realise how igneous rocks can be effectively used in unravelling the tectonic evolution of orogens.

When I joined Saint Mary’s University in 1981, I was looking for new challenges. I got more than I had expected when I started work in the Cobequid Highlands of Nova Scotia – deformed rocks, outcrops restricted to brooks with impassable waterfalls, blackflies and all the other delights of Canadian fieldwork. Although I started working on Neoproterozoic back-arc volcanic rocks, my greatest pleasure was in collaborations with structural geologists on the origin and emplacement of Devonian–Carboniferous plutonic rocks in the magnificent Cobequid Shear Zone. The Cobequid Highlands became a training ground for scores of undergraduates who worked as field assistants or who did honours theses on rocks others had collected. I came to firmly believe that experiential learning of geological problem solving must begin at the undergraduate level. I am proud of the numerous students whose geological skills I have helped to develop, while at the same time they were helping me complete my research. Assisting students gain work experience through the Cooperative Education program allowed me to network across Canada.

I was also fortunate in the collaborations I had with the Geological Survey of Canada, working on igneous rocks beneath the Scotian Shelf. This led quite unexpectedly to two significant discoveries: the first submarine impact

crater at Montagnais and the first Alleghanian pluton in the Canadian Appalachians at German Bank. Working with scientists in other subdisciplines of geology was never encouraged in Greece, where I had been labelled as a Reader in Geochemistry, but was to become one of the great pleasures and influences in my career in Canada.

I continued to work in Greece, collaborating with colleagues in all three geology departments there. I wanted to use the fresh Greek igneous rocks, formed in young tectonic environments that could be reasonably constrained, to help understand older rocks in the roots of the Appalachian orogen. This work led to our book, *The Igneous Rocks of Greece*, which provided a synthesis of the geological evolution of the Hellenide orogen, principally as revealed by the igneous rocks. It was a lot of work, but it brought satisfaction, if not riches, to see the numerous xerox copies of the book in Greek universities and the frequent use of key figures, with or without acknowledgement, in published papers.

In the last ten years, I have been a bit of a VIP renegade. Opportunities for student employment and research funding in Nova Scotia moved from hard rocks to petroleum. Applying my skills in mineralogy to solving problems of sediment provenance and reservoir diagenesis was not only a new intellectual challenge, but also brought funding for equipment and employment opportunities for students. But this phase of my career is perhaps now winding down and I am looking for a change of scenery and new challenges.

So looking back on my career, what things did I do

right? Having a double professional life, in Greece and in Canada, was highly stimulating and provided solace at times of disappointment. Maintaining an engaged and caring family life was possible through the flexibility of my employers, many individuals and organisations, but also through my own willingness to be adaptable and unconventional. Our daughters saw Parrsboro and Santorini while their friends went to Disney World and Cuba. Working within the system to bring about change was immensely satisfying, particularly within the universities where I have worked, but also in professional organisations including VIP. Changing research scenery every decade and the support of numerous colleagues and students has been essential in keeping me young at heart. If you, the reader, have a career as enjoyable and interesting as mine, then count yourself lucky.

Georgia Pe-Piper



2010 Volcanology and Igneous Petrology Division Financial Summary

Balance January 1, 2010	4310.00	
	Credits	Debits
Dues*	1110.52	
Publication sales		
Support for shortcourse		
Annual Business Meeting , lunch		531.56
Newsletter		
Postage, Copying, Miscellaneous Office		19.54
Web page charges		16.74
VIP Award Medal Engraving & new medals		1246.88
Profit from shortcourse		
Bank Charges		2.75
Bank interest	1.32	
Totals	1111.84	1817.47
Balance December 31, 2010	3604.37	

GAC-MAC Winnipeg 2013

The 2013 Geological Association of Canada (GAC) and the Mineralogical Association of Canada (MAC) Annual Meeting will be held 22-24 May 2013, in Winnipeg, Manitoba.

First Call for Special Sessions (SS) and Technical Sessions (TS)*

Session Submission Deadline: October 1st 2011

**Please send proposed session titles and descriptions to
Mostafa Fayek (fayek@cc.umanitoba.ca) and/or
Christian Böhm (christian.bohm@gov.mb.ca)**

Special Session (SS) and Technical Session (TS) descriptions should be a maximum of 100 words (excluding the title, organizers names, affiliations and email), and include a brief statement regarding the significance of the session (e.g., dedication) and outline the type of contribution the organizer would like to include in their session. *Abstracts that are submitted, but do not fit in a SS or TS will be organized into General Sessions (GS) (e.g., Mineralogy, Geochemistry, Geophysics).

EXAMPLE (SS):

**SS 1. Understanding minerals: from chemistry to structure, from structure to chemistry
(Session dedicated to Frank C. Hawthorne)**

EXAMPLE (TS):

TS 1. Uranium in the Environment

**Organizer: M. Fayek, Dept. Geological Sciences, University of Manitoba
(fayek@cc.umanitoba.ca)**

Uranium in natural (e.g., uranium deposits) and anthropogenic (e.g., nuclear waste disposal sites) systems presents an increasing concern to humans in regards to ground water quality and habitat contamination. Contributions on subjects of uranium in various geologic settings, from uranium deposit research and their use as natural analogues for geologic disposal of spent nuclear fuel, to fate and transport of uranium in solution, as nanoparticles, and colloids, are strongly encouraged. In addition, topics on toxicities and threats to aqueous habitats are also encouraged.

Sponsoring Societies

- **Mineralogical Association of Canada (MAC)**
- **Geological Association of Canada (GAC)**

Meeting Announcements



The next Goldschmidt meeting will take place in Prague, Czech Republic from August 14-19, 2011. Visit their [web site](#) for details.



Melbourne, Australia is the host to the IUGG meeting “Exploring on the edge: Science for a sustainable planet” from 28 June to 7 July 2011. Visit their [web site](#) for details.



The 25th International Applied Geochemistry Symposium will take place in Rovaniemi, Finland from 22-26 August, 2011. Visit their [web site](#) for details

Institute on Lake Superior Geology



The 58th Annual meeting of the ILSG will be held in Thunder Bay, Ontario in May, 2012 with field trips both before and after. Visit the [ILSG website](#) for more details.

Can you help?

Glyn Williams-Jones has asked that we bring this to the attention of the membership. He has recently become involved with a non-profit organisation (with official non-profit status in Washington State and BC), the International Volcano Monitoring Fund (<http://www.ivm-fund.org>), whose mission is to “serve volcanically-threatened communities in low- to middle-income countries by providing instrumentation, training, and education to monitor volcanic activity and raise awareness about the environmental hazards of active volcanoes.” The group currently has an initiative in place to collect donations to help volcanologists at the Santiaguito Volcano Observatory in Guatemala (<http://www.ivm-fund.org/guatemala/>) acquire a variety of simple field equipment and monitoring instruments.

If you can help please contact Glyn at glynwj@sfu.ca