ASH FALL

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

No. 76 November 5, 2012

From the Editor

I have to start this editorial with an apology, as this edition of Ashfall is later than I would have liked. It is also quite a bit shorter than I would have liked. I have mentioned in the last few editions that we are constantly struggling to track down submissions for Ashfall and unfortunately that hasn't changed.

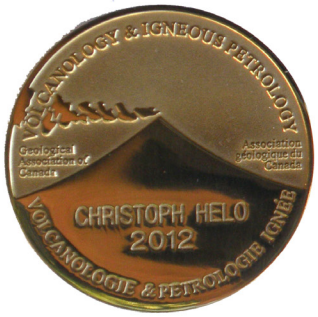
Unfortunately I am struggling to find the time to commit to Ashfall and consequently I think that it is time for someone new to take over as Editor. Hopefully a fresh face, with new ideas will be able to revitalise Ashfall. So, come the Annual Meeting during GAC-MAC in Winnipeg, I will be stepping down as Secretary/Treasurer for the VIP Division. I have thoroughly enjoyed my time in the role and it really is not all that much work, so hopefuly there will be no shortage of eager young volunteers interested in taking on the job. I would be more than happy to discuss what the job entails with anyone who is interested!

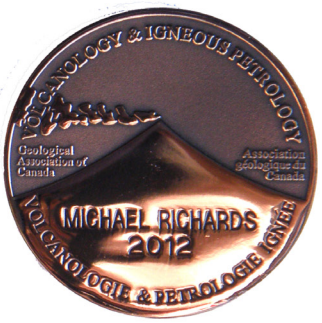
On a much more positive note this edition of Ashfall includes the citations and responses for this years recipients of our various awards.This years crop continues to demonstrate the outstanding scientists working in our discipline.

Cheers

Pete

This 2006 photo taken from the International Space Station shows the eruption of the Cleveland Volcano in the Aleutian Islands. Source: http://earthobservatory.nasa.gov/IOTD/view.php?id=6592





2012 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 - Christoph Helo

The thesis which won the Gelinas Gold Medal this year is the thesis by Christoph Helo from McGill University entitled "Pyroclastic eruptions in mid-ocean ridge settings: insights from Axial Seamount, Juan de Fuca Ridge, and analogue experiments" supervised by John Stix. This is an outstanding thesis, which integrates observational, geochemical and experimental approaches to better understand the causes and mechanisms of explosive volcanism at deep submarine volcanoes. His field study area is an active volcanic system providing evidence of explosive activity at ~1,400 meters water depth.

The first two chapters of the thesis deal with the physical volcanology and chemical evolution of Axial Seamount. They document both deep mantle melting processes and open system dynamics of the shallow magma reservoir. Christoph was able to place constraints on when caldera formation occurred. He also reported the highest dissolved carbon dioxide concentrations ever measured in MORB and concluded that explosive eruptions at Axial were driven by the high carbon dioxide concentrations, and that the mantle is enriched in carbon beneath the seamount.

The third and fourth chapters deal with experiments. The third chapter focuses on the experimentally rapid cooling of pyroclastic fragments erupted from the Axial volcano. It shows that fragmentation is a product both of ductile processes triggered by strombolian activity, and brittle processes caused by rapid quenching. In the fourth chapter, Christoph describes a series of analogue experiments, which investigate the role of bubbles and conduit diameter in influencing fragmentation. The results show that when decompression is small, the role of bubbles is to aid in fragmentation. On the other hand, when the decompression is high, their role is negligible. A narrow conduit causes the flow to become choked, followed by an efficiently fragmented gas-rich front of the flow. By contrast, a widened conduit inhibits fragmentation.

Citation by Jarda Dostal

Christoph's response

I would like to take this opportunity to express my gratitude and thank the Volcanology and Igneous Petrology Division of the Geological Association of Canada for awarding me the Léopold Gélinas Gold Medal. I highly appreciate the honour I am given in receiving this prestigious distinction.

I have to admit little did I know what I was getting into when starting my PhD at the McGill University. The opportunity to studying explosive volcanic activity in a MORB setting, a setting usually taught as the textbook example for effusive activity seemed and still is very exciting and fascinating to me. To me the beauty of this field of research arises from the fact that it demonstrates almost on a daily basis how little we know about many basic (igneous) processes in and on the Earth and how much remains to be learned. The excitement arises from taking the challenge to lessen this discrepancy. And this challenge I tried to take in my PhD research. Yet, none of this work would have been possible without many great people supporting me along the way.

This award therefore merits everybody who has sup-

ported me throughout these past years. I am grateful to many excellent scientists, who assisted and guided me through this research.

In particular, Dave Clague who has made this project possible by getting me on board the Western Flyer for the MBARI 2006 Expedition, and on board the project concerned with on Axial Seamount. Dave has been a source of fruitful discussions and constructive feedback during the entire time of my PhD studies. Here, I also would like to take the chance to thank the non-scientific cruise members for their part in making these cruises successful. Simply the kitchen on board the Western Flyer would be worth a cruise.

Nobuchimi Shimizu welcomed us at his lab at the Woods Hole Institution to conduct volatile analysis of melt inclusions using the ion probe. The results of this week became the most surprising and important part of my PhD research. I am very thankful for his assistance and inspiring discussions as well as his strong interest in the project.

Across the Atlantic Ocean, Don Dingwell at the University of Munich and Jeremy Phillips, at the Bristol University have allowed me to "occupy" part of their labs and use their excellent facilities for several weeks.

And last, but most importantly I would like to thank my supervisor John Stix for his patience and endless support. He believed in this project form the very first beginning on until today. John has the great ability to re-spark enthusiasm and fascination no matter how confusing the project just seemed a second before. This project would have not been possible without him and his great way of supervision.

A great deal I owe to my wife and my son who kept waiting to be born right until I had submitted my thesis.

All of these people contributed significantly to the successful completion of my thesis. Thank you very much to all of you!!

I would like to acknowledge the financial support I was given by McGill University through various fellowships made possible by generous donors, and lastly cite Johann Wolfgang Goethe in his theatre play "Faustus":

"That I may detect the inmost force
Which binds the world, and guides its course;
Its germs, productive powers explore,
And rummage in empty words no more!"

Silver medal - Donnelly Archibald

The Gélinas Silver Medal was awarded to Donnelly Archibald from Acadia University, who was supervised by Sandra Barr and Brendan Murphy. His thesis is entitled "Field relations, petrology, and tectonic setting of the Ordovician West Barneys River plutonic suite, southern Antigonish Highlands, Nova Scotia". Donnelly's thesis provided a detailed description of the plutonic suite making a significant contribution to Nova Scotian geology. Congratulations Donnelly! *Citation by Pete Hollings*

Donnelly's response

I am very appreciative and honoured to receive the Léopold Gélinas Silver Medal. Thank you to the Volcanology and Igneous Petrology Division of the Geological Association of Canada for awarding me this prestigious medal. I would like to express my gratitude to my supervisors Dr. Sandra Barr (Acadia University) and Dr. Brendan Murphy (St. Francis Xavier University) for their support and guidance through¬out this project. Thank you to Dr. Chris White of the Nova Scotia Department of Natural Resources for providing me with summer employment, geochemical analyses, and samples. I consider myself very fortunate to have worked for the Nova Scotia Department of Natural Resources while completing my field work. In doing so I gained valuable field experience. Receiving this award demonstrates the importance of mentorship through summer employment. Being recognized by the GAC acknowledges the hard work that went into completing my thesis. This recognition is truly an honour.

Bronze medal - Michael Richards

This year the Leopold Gélinas Bronze medal for best B.Sc. thesis in volcanology and igneous petrology went to Michael Richards, University of New Brunswick, for his thesis "Rare Earth Element – Niobium Enrichment in Carbonatite Hosted Within the Clay-Howells Alkali Complex, Kapuskasing, Ontario: Implications of Auto-Oxidation and Magnitite Fractionation in Ferrocarbonatites". The thesis used various analytical tools including laser ablation inductively coupled plasma - mass spectrometer, scanning electron microscopy (energy dispersive spectrometry and back-scattered electron imaging), petrographic analysis of polished thin sections, and whole rocks geochemical analyses in order to derive a suitable genetic model to explain the distribution of magnetite, rare earth element, and niobium within the Clay-Howells carbonatite. *Citation by Michelle DeWolfe*

Michaels's response

It is a great honour to have been chosen and recognized by such a distinguished group within the field of Geology. This award holds so much meaning for me looking forward as well as backward. Forward, it invokes such a sense of accomplishment and confidence in the potential of future research. Looking back, it will serve as a constant reminder that hard work, determination, and expert guidance are the foundation of any great work. With that in mind, I would like to thank first and foremost my thesis advisor Prof. Dave Lentz. He was there to answer any questions I had during the development of my thought process, and was always quick to respond and offer support. I would also like to thank Rare Earth Metals Inc. and Reg Felix for providing me with the opportunity to work on such an amazing project. Many thanks as well to Prof. Chris McFarlane and Dr. Douglas Hall for their technical assistance during the development of my thesis data.

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 John Stix

John Stix is one of the leading volcanologists in Canada. His research is concentrated on the transport and evolution of fluid phases during transport from the magma reservoir to the atmosphere, and on the chemical and physical evolution of large silicic systems and their surface expressions (caldera systems). In the first category, he has worked on degassing styles and the evolution of gas phases in magma reservoirs, and on the monitoring of gas emissions from volcanic systems. In the second, he has made significant contributions to the question of how big silicic reservoirs are restored and replenished after caldera-forming eruptions. He has also expended considerable effort in understanding and identifying the precursors to new caldera-forming eruptions. He and his former students have improved our understanding of the physical aspects of caldera subsidence. Through detailed field work and modelling they have revealed important clues to styles and mechanisms of collapse events. They have helped to correlate surface (morphological) expressions and tectonic features to various styles of caldera subsidence. At the same time, they have recognized important magmatic processes associated with collapse events, such as direct coupling mechanisms between the collapse event and the dynamics and evolution of the magmatic system. The quality of John's research was recently recognized by NSERC, with the award of a Discovery Accelerator Supplement in 2009.

John has supervised a large number of graduate and undergraduate students in volcanology over his career at Université de Montréal and McGill. The strongest testament to the quality of his supervision is the number of Léopold Gelinas awards his students have received from the Volcanology and Igneous Petrology Division of the GAC for the quality of their theses. His students won gold medals in 1995, 2007, 2009 and 2010, silver medals in 1997, 1998, 2001 and 2004 and a bronze medal in 2004. This is a quite remarkable record, and reflects the energy, enthusiasm and effectiveness of John Stix' mentoring. Three of his former graduate students are now volcanology professors in their own right at major universities. John's contributions to teaching were recently recognized by his receiving the 2010 Leo Yaffe Award for Excellence in Teaching, given to a member of the Faculty of Science at McGill for superior teaching at the undergraduate level.

On the professional level, John has served as, among other things, Secretary, IAVCEI Commission on the Chemistry of Volcanic Gases (2000-2004), Chair of the Volcanology and Igneous Petrology Division, Geological Association of Canada (2001-2004), Canadian Director, North American Earth Hazards Program (2004-2008) and Executive Editor of the Bulletin of Volcanology (since 2003). Astonishingly, he has managed to fulfil many of these roles while also being Chair of the Department of Earth and Planetary Sciences at McGill (2003-2004, 2006-2010).

Apparently insufficiently burdened with his scientific and administrative responsibilities, John has also been intimately involved with Outreach activities. In addition to participating in frequent discussions of volcanic hazards in all forms of public medium over the years, John was Associate Editor of Encyclopedia of Volcanoes, a 1,417 page reference work published by Academic Press in 2000, which won prizes from the Geological Society of America and the Association of American Publishers, Geography and Earth Science Division.

Citation by Andrew Hynes

John's response

I would like to thank the Volcanology and Igneous Petrology Division for this fantastic award. I am very honoured by it. I have been studying active volcanoes for the past 23 years, and it has been a great time indeed. Volcanology in Canada is small but strong, and things have been getting steadily better over time. Smart young people are getting key jobs in academia, so that today there is remarkable volcanological breadth in Canada ranging from the observational through experimental approaches to sophisticated numerical modeling work. I think it is a good time research-wise, and it would be great indeed to ramp up to the next level in terms of people and big new projects.

I received my Bachelors degree from Dartmouth College. I must have been bitten early by the volcanology bug there, since Dick Stoiber had assembled a stellar group of undergraduates, graduate students, and postdocs. Trips to active volcanoes make a huge impression on an undergraduate. My graduate work at the University of Toronto, first with Al Goodwin and then with Mike Gorton, was simply fun. Mike is the best supervisor a student could hope for, allowing me scope to explore new topics on my own as well as providing amazing scientific insight into a particular set of data or research problem. I learned from him how to try to wring out the very last ounce of information and insight from a series of numbers. The intellectual atmosphere at Toronto was wonderful for a graduate student, and I will never forget late nights in the Mining Building watching mice run over my petrographic microscope. My first job after graduating from Dartmouth was geothermal research at Los Alamos with two peerless mentors, Grant Heiken and Fraser Goff. Grant and Fraser, each in their own unique way, knew how to scientifically engage a budding young scientist.

The field of volcanology today is remarkably innovative, just as is the larger geoscience picture. The integrative science that routinely gets done today involves research groups comprising undergraduates and sometimes high school students, graduate students, and postdocs. It is gratifying for me to see these young scientists interact and collaborate among each other. The broad-based nature of volcanology is so apparent today and so different from 20 years ago. Now it is common for a graduate student to become proficient at making observations in the field and lab, conducting his or her own experiments, and then modeling field and experimental results using sophisticated numerical algorithms. The new technology available today is stunning, especially for fieldwork where we can use thermal infrared cameras with remarkable capabilities and mass spectrometers in real time. We are well on our way to improving our predictive capability for eruptions. One interest of mine is attempting to identify the next caldera-forming eruption – before it happens of course!

The Volcanology and Igneous Petrology Division does an amazing and great job for volcanology in Canada. The awards and medals it gives to undergraduate and graduate students for their theses are unique. It is a brilliant way to inspire scientific excellence, and I am ever so grateful to the Division for these efforts and for my award.

John Stix, 28 October 2012

2011 Volcanology and Igneous Petrology Division Financial Summary

Balance January 1, 2011	**3604.37**	
	Credits	**Debits**
Dues	990.00	
Publication sales		
Support for shortcourse		
Annual Business Meeeting , lunch		91.33
Newsletter		
Postage, Copying, Miscellaneous Office		
Web page charges		16.77
VIP Award Medal Engraving & new medals		293.80
Profit from shortcourse		
Bank Charges		1.65
Bank interest		
Totals	**990.00**	**403.55**
Balance December 31, 2011	**4190.82**	

Meeting Announcements

The 2013 GAC/MAC meeting will take place at the Winnipeg Convention Centre from May 22th to 24th, 2012. Visit the meeting website for details.

Institute on Lake Superior Geology

www.lakesuperiorgeology.org

The 59th Annual meeting of the ILSG will be held in Houghton, Michigan on May 9 and 10, 2012 with field trips both before and after. Visit the ILSG website for more details.

VIP reminders

The **Career Acheivement Award** - the deadline is ***31 January 2013*** and nominations should be sent to Jarda (jarda.dostal@stmarys.ca)

The **Gold Gelinas medal** for an outstaning PhD thesis in the fields of volcanology and igneous petrology - the deadline is ***28 February 2013*** and nominations should be sent to Jarda (jarda.dostal@stmarys.ca)

The **Silver Gelinas medal** for an outstaning MSc thesis in the fields of volcanology and igneous petrology - the deadline is ***28 February 2013*** and nominations should be sent to Pete (peter.hollings@lakeheadu.ca)

The **Bronze Gelinas medal** for an outstaning Honours thesis in the fields of volcanology and igneous petrology - the deadline is ***15 April 2013*** and nominations should be sent to Michelle (mdewolfe@mtroyal.ca)

VIP sponsored sessions at GAC-MAC 2013

This year the VIP Division will be sponsoring the following sessions at GAC-MAC and encourage our members to submit abstracts to these sessions:

'Testing Links Among Large Igneous Provinces, Iron Formations, and Volcanogenic Massive Sulfide Deposits' - chaired by Andrey Bekker & Richard Ernst

'Assembly of North America: A Tectonic and Metallogenic Reappraisal' - chaired by Andrey Bekker, Sally Pehrsson, Natasha Wodicka & Christian Böhm

'Tectonic Evolution and Metallogeny of the Superior Province: New Insights from the North Caribou Terrane, the "Ring of Fire," and Beyond' - chaired by Scott Anderson, Christian Böhm, Tim Corkery, Peter Hollings

GAC-MAC 2014

The organisers of the 2014 GAC-MAC meeting in Fredericton are still accepting proposals for Technical Sessions. Please send a bried description, names of co-chairs and their affiliations to Jim Walker (Jim.Walker@gnb.ca).