

# GEOLOG spr

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## President's Preamble The Ground-Level View

Like many geologists I have crossed this country many times. I am a Maritimer but have spent much of my working career on the Prairies; nowadays I regularly traverse the country from Winnipeg to Fredericton to visit my parents. I usually enjoy flying, particularly when the weather is clear and I can thoroughly enjoy that "30,000-foot view" from my window seat. There is something quite wonderful about having that vantage to contemplate the boundary between the Appalachians and the St. Lawrence Lowlands south of Québec City, or to consider the line between shield and platform north of Lake Huron.

A few days ago, heading eastward out of Winnipeg, we had just the right sort of a morning. Under a cloud-free sky, I could see the iceberg tracks across the fields near Stony Mountain, then the near-flood Red River flowing into its delta before disappearing into the great frozen mass of Lake Winnipeg to the north. As we climbed, the huge mass of Canadian Shield looked tranquil under its thin snow cover. At 30,000 feet, the form of the lakes and rivers gives but a heavily veiled impression of what lies beneath, and the average viewer at that height might be forgiven for thinking that the geology of the Superior Province is straightforward and simple. The geologist, of course, knows that this is far more than a stone's throw from the truth.

To me, this seems like a good analogue for the situation of Earth Science societies in Canada. Most of us spend much of our careers taking the 30,000 foot view of how our societies function: we travel to well-attended national conferences where we hear first-rate presentations, we see journals and books being produced, we pay our dues and receive communications from GAC<sup>®</sup>, MAC, and the various discipline- or region-specific organizations. Sure, we

may occasionally fly a bit closer to the ground and see a bit of the complexity of the situation, when we hear that a society has diminishing membership (a common situation given the confluence of demographics and economy), or that an



organization has posted a deficit. But most of the time our view is through wispy clouds from somewhere well over 20,000 feet.

That is certainly how it has been for me, in the intervals when I was not actively engaged as a Paleontology Division executive member or as a member of GAC<sup>®</sup> Council. In the past two years, though, as Vice President and President of GAC<sup>®</sup>, I have had ample opportunity to sample the view from ground level (and sometimes from somewhere rather more subterranean). What this "societal fieldwork" has taught me is that there is no single answer that could be given, if you ask how Canada's geoscience societies are doing. Some aspects are going remarkably well, while others could be described as moribund at best.

This is particularly true of the regional or disciplinespecific organizations. On my previous trip to Fredericton in February, I had the opportunity to attend the Atlantic Geoscience Society conference (see p. 8). This was a remarkable experience: what I had assumed would be a small regional meeting with a modest slate of local talks turned out to be an exciting conference with several parallel sessions of dynamic presentations by students and professionals! Other organizations also host their own successful annual meetings (such as my own

### **GEOLOGICAL ASSOCIATION OF CANADA**

The MISSION of the Geological Association of Canada is to facilitate the scientific well-being and professional development of its members, the learned discussion of geoscience in Canada, and the advancement, dissemination and wise use of geoscience in public, professional and academic life. The VISION of the GAC<sup>®</sup> is to be a multidisciplinary scientific society supportive of the entire scope of the geosciences in Canada. The GAC<sup>®</sup> aims to be a geoscience community that is knowledgeable, professionally competent and respected, whose input and advice is relevant, widely sought and utilized, and whose vital contribution to the economic prosperity and social well-being of the nation is widely acknowledged.

La MISSION de l'Association géologique du Canada est d'aider au développement scientifique et professionnel de ses membres, de favoriser les échanges géoscientifiques au Canada ainsi que de promouvoir et de diffuser l'utilisation éclairée des géosciences dans un contexte public, professionnel et académique. La VISION de l'AGC<sup>®</sup> est de faire connaître une communauté géoscientifique de grand savoir, dont les compétences professionnelles sont respectées, dont les suggestions et les avis sont pertinents, recherchés et utiles, et dont la contribution largement reconnue est considérée comme vitale pour la prospérité économique et le bien-être de la nation.

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The 2017 Annual meeting of the GAC-MAC in Kingston will coincide with the 175th anniversary of the founding of the GSC in Kingston. The Geological Survey of Canada, Canada's oldest scientific agency, was established by the legislature of the Province of Canada in 1842, in Kingston, Canada West.

The Department of Geological Sciences and Geological Engineering at Queen's and the GSC will be hosting this celebratory event at Queen's University.

Please join us at the conference May 14-18, 2017.

For more details see: www.kingstongacmac.ca

### GEOLOG

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GEOLOG (ISSN 0227-3713; 1712-3747) is the quarterly newsmagazine of the Geological Association of Canada, St. John's, Newfoundland and Labrador. GEOLOG is published for the benefit of GAC<sup>®</sup> members and its content reflects the diversity of the organization. News items and short articles on topics of potential interest to the membership including public geoscience awareness are encouraged. Also encouraged are communications promoting interaction among academic, industry and government sectors. *GEOLOG* accepts and publishes contributions in both of Canada's official languages. Opinions expressed herein are those of the writers and do not necessarily represent the official positions of the GAC<sup>®</sup>. *GEOLOG* is one of several forums provided by the GAC<sup>®</sup> for scientists worldwide.

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GEOLOG (ISSN 0227-3713; 1712-3747) est le bulletin trimestriel de l'Association Géologique du Canada, à St. Jean, Terre-Neuve-et-Labrador. GEOLOG s'adresse aux members de l'AGC® et son contenu reflète le caractère polyvalent de cette organisation. Nous invitons la soumission de nouvelles et articles courts pouvant intéresser les membres, incluant les thèmes de sensibilisation du public aux sciences de la Terre. Les articles suscitant des échanges d'opinions et d'informations entre les secteurs académique, industriel et ouvernementaux sont également la bienvenue. GEOLOG accepte et publie les articles dans les deux langues officielles du Canada. Les idées sont celles des auteurs et ne représentent pas nécessairement la position officielle de l' AGC®. GEOLOG n'est qu'un des nombreux forums offerts par l' AGC® aux scientifiques à travers le monde.

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### Contents / Table des matiéres

President's Preamble	.1, 4
Reading on the Rocks	5
Milestones, Memories and Tributes	6
Atlantic Geoscience Society Annual Meeting	8
Travel Log: GAC <sup>®</sup> Hutchison Lecture Tour	12
GAC <sup>®</sup> -PDAC Logan Student Prize Winners	15
Announcements	17
Second Annual Student Photography Award Winners	18
GAC® National Award Winners	20

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### **Contributions for next issue**

Please send items for the next issue of *GEOLOG* by e-mail to Alwynne.Beaudoin@gov.ab.ca on or before **June 1 2017**.



The Geological Association of Canada's booth set up and ready for visitors at the Prospectors and Developers Association of Canada (PDAC) 2017 meeting in Toronto in early March.

Look out for the GAC<sup>®</sup> booth at the upcoming GAC-MAC meeting in Kingston. It'll be a great opportunity to stock up on any GAC<sup>®</sup> publications you may have missed and chat to our helpful and friendly GAC<sup>®</sup> staff members.

### Cont'd from p. 1

beloved GAC<sup>®</sup> Paleontology Division), and of course there are the superb lectures and other activities put together by divisions such as Mineral Deposits Division.

But those are the high points, and overall the national view at ground level is spottier. The 30,000 foot view of Canada would tell us that geologists are few and far between in this huge land. This means that, if you or one of your immediate colleagues are not organizing a regional or discipline meeting, or carrying out other voluntary tasks in the service of Canadian geoscience, then those things are probably not being done. I can think of one or two organizations that appear to have had no meetings or much other appreciable activity in the past several years.

Overall, the national part of GAC<sup>®</sup> is holding its own, with the situation improving in some regards: it cannot always be described as a well-oiled machine, and the leadership of volunteer presidents may be uneven (it takes some of us a long time to learn and understand this position), but we have a tremendously effective and active Council and staff, the flagship GAC-MAC meetings are already planned for the next several years, new publications are in the works, recent lecture tours have been very well received and attended, other initiatives are being undertaken, and membership numbers are at least holding steady.

As far as I can tell, our frequent collaborator MAC is doing well and developing exciting projects, but both organizations share certain concerns. How do we get young scientists engaged in scientific societies? How do we handle succession planning, and attract new Councillors who have the appropriate talent, and the interest and motivation to contribute voluntary work that may go unrecognized by the community at large (not to mention by promotion committees or granting agencies)? How do we continue to renew our products and offerings so that we will be relevant to the geoscientists of the mid-21<sup>st</sup> century?

When you get right down to it, most of us got into this field because we love some aspect of the science; maybe as a child you searched for fossils, or collected minerals, or were intrigued by volcanoes. Geology is our avocation as well as our job, and fieldwork or mentoring or even core logging sits somewhere close to our inner self. While serving the geoscience community might take us away from doing those things, it is incumbent on each of us to get out there and do what we can to make the Canadian geoscience community stronger and better.

I challenge you to descend from 30,000 feet to ground level in your view of geoscience societies. Volunteer to be on the executive of your section or division, become a member of a GAC-MAC Local Organizing Committee, plan a local meeting or field trip, or submit a publication idea to GAC<sup>®</sup> publications. It is a busy, messy, and occasionally frustrating place down here, but ultimately tremendously rewarding, and I wouldn't have missed this experience for anything.

> Graham Young GAC<sup>®</sup> President



Mont Rougemont, rising out of the Saint Lawrence Lowlands, is one of the Monteregian Hills. These igneous hills, which include Mount Royal and mont Saint-Hilaire, were formed as North America slid over a "hot spot" during the Cretaceous Period. Photo: Graham Young, 2016

## **Reading on the Rocks**

*The Man Who Found Time: James Hutton and the Discovery of the Earth's Antiquity,* by Jack Repcheck. 2003. Perseus Publishing. 247 pages. ISBN: 0-7382-0692-X

Jack Recheck begins his account of the life of James Hutton (1726-1797) with one of the most famous incidents in the history of geology. One summer afternoon in 1788, Hutton set sail in a small boat with two much younger friends, John Playfair and Sir James Hall, to look for evidence of deep time in the rocks along the coast south of Edinburgh. They found it at Siccar Point, where steeply tilted Silurian rocks are overlain unconformably by Devonian sandstones. To Hutton's satisfaction, this provided evidence of the erosion cycles he was convinced had to have occurred.

Hutton is best known for the maxim "no vestige of a beginning, no prospect of an end", the closing phrase of his 1785 presentation to the Royal Society of Scotland explaining his ideas on deep time and defining uniformitarianism in earth science. The presentation had a splendid title: "Theory of the Earth; or an Investigation of the Laws observable in the Composition, Dissolution, and Restoration of Land upon the Globe". It's available as a PDF from archive.org.

Hutton was a Scot who spent most of his life in and around Edinburgh. He went to university and began training in medicine, mainly because of his fascination with chemistry. He did not complete these medical studies but lived in Europe for a few years , apparently to avoid the consequences of fathering a child. On return to Scotland, Hutton decided to become a gentleman farmer. He spent several years in Norfolk learning the latest scientific methods, which he applied on his own farm at Slighhouses. His farming experience and focus on soils probably gave him insights into erosion. After a decade farming, he returned to Edinburgh in 1767 and lived there for the rest of his life. He was comfortably off, living on rents , plus income from his farm and from a business partnership.

Repcheck situates Hutton as a member of the Scots intelligentsia. The late eighteenth century was the time of the Scottish Enlightenment, an extraordinary flowering of intellectual activity. Among other luminaries in Edinburgh at this time were Adam Smith, author of The *Wealth of Nations* published in 1776, the philosopher David Hume, and chemist Joseph Black who discovered carbon dioxide.

With the encouragement of friend, Hutton drew his observations on erosion



and development of the earth into a theory, which was later put into book form. His major contribution was in linking two observations: "that most rocks are made up of eroded material" and "that all surfaces on the earth are subject to constant erosion" (p. 113).

According to Repcheck, Hutton was not a gifted writer and his ideas did not gain widespread currency at first. His friend, John Playfair, described the concepts more lucidly in *Illustrations of the Huttonian Theory of the Earth* in 1802. However, it was not until Hutton's ideas were incorporated in Charles Lyell's *Principles of Geology* that they became more widely known. Lyell's books were read by Charles Darwin during the *Beagle* voyage and helped shape his thinking on deep time. This in turn fed into the development of Darwin's concept of evolution, that is, the effect of small changes acting over unimaginably long intervals of time. It was almost a century from Hutton puzzling over soil erosion on his farmstead to the publication of one of the most influential and important books in science.

Repcheck provides a highly readable introduction to Hutton's life and times, showing how fundamental was the expansion of geologic time from a few thousand to millions of years for later developments in earth science. We are so used to thinking in terms of deep time that it is salutary to be reminded how revolutionary this idea was just a couple of centuries ago.

> Alwynne B. Beaudoin Edmonton, Alberta

## **Milestones, Memories, and Tributes**

## Atholl Sutherland Brown 1923-2016

Dr. Atholl Sutherland Brown, who served as British Columbia's 8th Chief Geologist from 1975 to 1984, died in Victoria in December 2016 at the age of 93. He was president of GAC<sup>®</sup> 1979-1980, GAC<sup>®</sup> Council Member 1976-1981, Chair of GAC-MAC Victoria 1983, J. Willis Ambrose Medallist 1987, Distinguished Fellow and Distinguished Member in 1995, and 50-Year Member in 2010.

Atholl was born in Ottawa, but grew up mainly in Victoria. He joined the Royal Canadian Air Force in 1941 and, as a member of the Royal Air Force in Burma, flew 48 missions and was awarded the Distinguished Flying Cross.

After the war, Atholl attended the University of British Columbia and subsequently earned a Ph.D. in geology at Princeton. He joined the British Columbia Geological Survey in 1951 and was involved in early mapping of the Cariboo and the Queen Charlotte Islands (Haida Gwaii). Atholl was an excellent scientist and wrote numerous papers on the geology and mineral deposits of British Columbia, especially porphyry copper and molybdenum deposits. This expertise lead to his editorship of the Canadian Institute of Mining and Metallurgy Special Volume No. 15 on "Porphyry Deposits of the Canadian Cordillera".

Atholl also authored several books including two published by the Geological Association of Canada. The first was *British Columbia's Geological Surveys 1895-1995: A Century of Science and Dedication,* which was a lively history of the British Columbia Geological Survey and its gyrations



published in 1998 to mark its 100 year anniversary. His most recent book, *Searching for the Origins of* 



Haida Gwaii - Adventures While Mapping the Geology of the Islands 1958-1962, was published in 2013 and is a testament to his incredible energy and fine intellect right to the end of his life.

Atholl was a natural leader always looking for ways to give back to the geological community. He served as President of the Geological Association of Canada in 1980 and was a charter member of the Committee of Provincial and Territorial Geologists. The Committee remains instrumental in establishing closer relationships amongst the provincial, territorial and federal geological surveys.

Atholl was an active member of the Victoria geological community and could be counted on to show up at the Survey's alumni golf tournament, Open House, and various social events. He was held in very high regard by the Canadian geological community and will be greatly missed.

> Adrian S. Hickin, Larry D. Jones, and Gordon Clarke

[Editor's note: Adapted from A.S. Hickin, L.D. Jones and G. Clarke 2017. British Columbia Geological Survey annual program review 2016- 2017. In: Geological Fieldwork 2016, British Columbia Ministry of Energy and Mines, British Columbia Geological Survey Paper, 2017-1, pp. 1-16, with additional information from GAC<sup>®</sup> files. Used with permission.]

## David W. Strangway 1934-2016

It is with sadness that we announce the passing of Dr. David W. Strangway, president of GAC<sup>®</sup> 1978-1979, GAC<sup>®</sup> Council Member 1975-1980, Logan Medallist 1984, Distinguished Fellow and Distinguished Member in 1995.

Among his other career highlights: Dr. Strangway was the only person to be president of both the University of British Columbia and the University of Toronto; he was Chief of the geophysics branch of NASA in the 1970s; and he was founding President of Quest University located in Squamish, BC.

For obituaries highlighting the life and career of Dr. David Strangway, please see:

www.theglobeandmail.com/news/british-columbia/ former-ubc-president-david-strangway-dies/ article33322319/ and vancouversun.com/news/local-news/former-ubcpresident-david-strangway-dead-at-82

Dr. Strangway's own website also provides insight into the career of the former GAC<sup>®</sup> president: davidstrangway.com/index.html

## Rolf Ludvigsen 1944-2016

We are sad to report the death of Dr. Rolf Ludvigsen on December 10 2016. Dr. Ludvigsen was a wellknown palaeontologist and member of GAC's Paleontology Division. He was the recipient of the Past President's Medal in 1984, and the Distinguished Member Award 1995.

## Arthur R. Sweet 1942-2017

It is with sadness that we report the death of Dr. Art Sweet on March 5 2017. Art was a long-time member of GAC<sup>®</sup> and the Paleontology Division. He was a wellrespected palynologist and worked at the Geological Survey of Canada in Calgary for many years.

For an obituary highlighting Dr. Sweet's life and career, please see:

www.legacy.com/obituaries/calgaryherald/ obituary.aspx?pid=184417013

[Editor's note: Short announcements are for information and do not preclude longer tribute articles at a later date.]



 Hutton's Unconformity at Siccar Point, southeast coast of Scotland. Near-vertical beds of Silurian greywacke are overlain by gently dipping Devonian Old Red Sandstone. There's conglomerate at the base of the sandstone. For more on James Hutton, see p. 5.
 Image: Dave Souza at Wikipedia (https://en.wikipedia.org/wiki/Hutton%27s\_Unconformity). Used under GNU Free Documentation License.

## **Events and Happenings**

## Atlantic Geoscience Society (AGS) 43rd Colloquium and Annual General Meeting

This year's Atlantic Geoscience Society (AGS) Colloquium and Annual General Meeting was kicked off by the GAC<sup>®</sup> Precambrian Division Howard Street Robinson Lecture delivered by Dr. Rebecca A. Jamieson and titled "How do large hot orogens work? Lessons from the middle crust."

A Friday afternoon professional development workshop was held at UNB. It was entitled "Portable XRF Applications in Geologic Research and Exploration" and was given by David Lentz (UNB) and sponsored by the New Brunswick Branch of the Canadian Institute of Mining, Metallurgy and Petroleum.

An AGS outreach event, *Earth Science Café* was held Friday evening at the Quartermain Earth Science Centre and included lively presentations.

The Colloquium had 179 registrants with many additional UNB student volunteers. There were three parallel sessions and a poster session. Among the highlights were Cees van Staal's and Reg Wilson's keynote talks in the "Northern Appalachian Orogen: Correlations and Conundrums" session. We thank Sandra Barr, Travis McCarron, Deanne van Rooyen, and Chris White for organizing this Symposium.

This was complemented by five Special Sessions, a General Session, and 27 posters.

1) "Museum and University Geology/Paleontology Collections" in memory of Don Reid, Order of Nova Scotia (1922-2016) - Conveners: Melissa Grey (Joggins Fossil Institute), Jason Loxton (Cape Breton University)

2) "Magmas and Metals" - Conveners: James Brenan (Dalhousie University), Donnelly Archibald (St. Francis Xavier University), Nadia Mohammadi (University of New Brunswick)



Cees van Staal (left) (retired GSC) and Reg Wilson (NB E&RD) Photo courtesy of Emily Palmer (UNB)

3) "Environmental Geoscience in the Atlantic Provinces and Beyond" - Conveners: Don Fox (Government of New Brunswick), Ian Spooner (Acadia University), Bruce Broster (University of New Brunswick)

4) "Advances in Carboniferous Geology in the Atlantic Provinces" in memory of Dr. Wouter van de Poll (1932-2017), Professor, UNB Geology (1970-1996) -Conveners: Adrian Park (Government of New Brunswick), Steve Hinds (Government of New Brunswick), David Keighley (University of New Brunswick)

5) "Where on Earth?: Education, Integration and Development of Earth Science for Social Benefit in Atlantic Canada" - Conveners: Ann Timmermans (University of New Brunswick), Kevin Gallant (New Brunswick Community College), Becky Geneau (Science East), Catherine O'Connell (University of New Brunswick, Planetary and Space Science Centre), Rilea Kynock (University of New Brunswick)

### **General Session**

"Current Research in the Northern Appalachians and North Atlantic Margin" - Cliff Shaw (University of New Brunswick), Warna Downey (University of New Brunswick).

The 27 posters covering all sessions were very well attended.

Awards were presented by Dr. Robert Raeside (Acadia University, and AGS Secretary) at the packed Banquet on Saturday evening.

The Awards Banquet and social was capped off by our entertaining guest speaker Dr. Randy Miller, Curator Emeritus, New Brunswick Museum and University of New Brunswick Adjunct Professor; "Maybe I could try geology!"



Prof. Becky Jamieson (Dalhousie University), winner of the AGS Gesner Medal 2017



Congratulations to our Award winners. Left to Right (above): Emily Palmer (University of New Brunswick), Graham Williams Award for Best Poster by a Graduate Student; Jennifer Adam (University of New Brunswick), Rob Raeside Award for Best Poster by an Undergraduate Student; Stephanie Todd (Acadia University), Sandra Barr Award for Best Oral Paper by a Graduate Student; Corin Jorgensen (Dalhousie University), Rupert MacNeill Award for Best Oral Paper by an Undergraduate Student. Photo courtesy of Alex Ani (University of New Brunswick). All in all it was a great Colloquium and Annual General Meeting full of new information and good friends. It was thoroughly enjoyed by everyone.

> Bob Grantham, Past President AGS

A very special thanks to the organizers of the 2017 AGS Colloquium and Annual General Meeting: David Lentz, Dave Keighley, Chris McFarlane, Anne Timmermans, Robin Adair, Jim Walker, Susan Johnson, and Mike Parkhill.

We also sincerely thank our sponsors:

- University of New Brunswick
- CIM New Brunswick
- Association of Professional Engineers and Geoscientists of New Brunswick
- New Brunswick Department of Energy and Resource
  Development
- New Brunswick Department of the Environment
- Wolfden Resources Corporation
- Amec Foster Wheeler
- Dillon Consulting



Dr. Randy Miller giving his presentation at the Awards Banquet Photo courtesy Emily Palmer (University of New Brunswick)



The Teacher Workshop associated with the AGS meeting was entitled: "Hands-On Earth Science Boot Camp". It was designed for teachers in New

Brunswick and Atlantic Canada and was held at University of New Brunswick. The Workshop was a huge success; thanks to the organizers and teachers!



Here Dr. Jenn Day (University of New Brunswick,) second from the left, is demonstrating slope stability with two other teachers, a student, and a gentleman reminiscing about days gone by enjoying Lego! Jenn was obviously having a lot of fun too. Photo courtesy of Emily Palmer (University of New Brunswick).



Winter colours and wet snow, Edmonton, March 2013. It looked like this in March 2017 too when Steve Piercey visited! See p. 13.

## Travel Log: 2016-2017 GAC Hutchison Lecture Tour Leg 1: Ontario

I have the pleasure of being the winner of the Hutchison Medal of the Geological Association of Canada for 2016-2017. As part of the conditions of the award the candidate undertakes a lecture tour and this entry is a synopsis of leg #1 of the tour, where I gave four lectures in Ontario. The two lectures presented included: "The interplay of magmatism, tectonics, and basic redox in the genesis of the Wolverine VMS deposit, Yukon" (Wolverine lecture), and a talk on Znrich VMS deposits (I recycled this from my 2015-2016 Howard Street Robinson lecture tour).

The tour started where I started my professional career at Laurentian University on January 16, 2017 where I gave the Wolverine lecture. It was great to be back in Sudbury amongst colleagues and students at Laurentian (where I still hold an Adjunct appointment!). The talk was attended by a lot of students and there was a great discussion after the talk. I owe special thanks to Elizabeth Turner and Dan Kontak for their hospitality while there. It's always a pleasure to get back to the place where I got my start, and with the people who gave me that opportunity!

The second lecture of the tour was on January 17 in Toronto as part of the Toronto Geological Discussion Group (TGDG). It was an industry-dominated audience and I gave the Wolverine talk. The presentation was also webcast via Geosoft; there were 90 people in attendance and another ~200 people registered online. There was a great question and answer session after the talk with an excellent networking session after the talk where I had a chance to socialize with the attendees. I thank Lynda Bloom for the invite to present; Taronish Pithawala for all the technical help leading up and during the presentation, including the webcast; Jane Werniuk for providing logistical help; and others of the TGDG for their hospitality. Thanks to Stan Wholley and my long time colleague Sandy Archibald for the great evening and geology talk after the event.

The third lecture was given at the University of Waterloo on January 18. I gave the Zn-rich VMS talk to a student-packed audience. The number of students in attendance was really impressive. The post-talk discussions with Brian Kendall (my host), Shoufa Lin, Chris Yackymchuk, Martin Ross, and their graduate students was fantastic. It was also great to see my colleague from Laurentian University, Darrel Long, who resides it the Waterloo area (thanks for the pick up at the train station and the chance to catch up!). I owe special thanks to my host Brian Kendall who provided the invite and dealt with all the logistics on the ground at Waterloo (and the awesome Waterloo water bottle)!

The final talk of leg #1 was at Western University on January 19. I gave the Wolverine talk to another student-rich audience and had a great time catching up with colleagues there. Thanks to Bob Linnen, Steph Perrouty, Martina Bertelli, Neil Banerjee, Phil McCausland, and Bill Church for spending time with me while there. The afternoon social at the Grad Club with the students was appreciated and a great send off! I owe special thanks to Roberta Flemming for her hospitality while there and thanks for both the awesome UWO mug and the lab tours while there!

Besides a delayed bag for 20 hours on the front end, and a few hours delay on the way back, it was pretty smooth travelling!

## Eastern and Western Canada and Tour Summary

In February, March, and April I undertook additional stops of the GAC<sup>®</sup> Hutchison Lecture tour, in both eastern and western Canada. The Atlantic Canada portion of the tour involved presenting two talks at the Atlantic Geoscience Society (AGS) Colloquium in Fredericton, NB, on February 10-11 (despite arriving late due to February weather in St. John's). The first talk was a new presentation entitled "VMS deposits of the Tally Pond group, central NL as monitors of tectonics, crustal architecture, and ocean chemistry along the Ganderian margin in the mid-Cambrian" and was presented in a special session on "The Northern Appalachian Orogen: Correlations and Conundrums". The second talk was the condensed Hutchison lecture talk on "Evaluating the interplay of magmatism, tectonics, and basin redox in the genesis of the Wolverine volcanogenic massive sulfide (VMS) deposit, Yukon, Canada" given in the "Magmas and Metals" session. The level of research at this meeting was outstanding, ranging from big picture tectonics and metallogeny to nano-scale analytical and experimental



Robson Street, early morning, Vancouver

research, and this was coupled with a fantastic social program. The organizers of the meeting (Dave Lentz, David Keighley, Jim Walker, Michael Parkhill, Chris McFarlane, Ann Timmermans, and Robin Adair) deserve special recognition for putting on such a content-rich and well-organized meeting.

The next leg of the tour involved western Canada (March 21-29). The first stop of the tour was at the University of Saskatchewan. I gave two lectures there on March 22. The first lecture was in Kevin Ansdell's economic geology class and was on "Seafloor Hydrothermal Systems: What are they? Their Significance. Resources on Sea and Land" and was a general talk on seafloor systems, how we explore for them, how do they form, and an overview of mining on the seafloor. The second talk was the Hutchison Lecture on the Wolverine deposit. The question sessions after both talks were great. After the talk I had the opportunity to look at a number of plate reconstructions and VMS distributions with Bruce Eglington. Special thanks to Camille Partin, Kevin Ansdell, and Bruce Eglington for their hospitality while hosting me at the University of Saskatchewan.

The next stop on the western leg was at the University of Alberta on March 23, where I gave the Zn-rich VMS



Rainy wet springtime at McGill

talk to the University of Alberta Earth and Atmospheric Sciences Graduate Students' Society (ATLAS). Thanks to Stephen Johnston for his hospitality while there. Special thanks to Merilie Reynolds for the invitation and being my host, and also spending time talking to me about her research on the Red Dog deposit (and you should check out her recent paper on a revised model for the Red Dog deposit!)

The third stop on the western leg was at Simon Fraser University on March 24 where I gave the Wolverine talk in their weekly speaker series. There were lots of great questions after the talk and I had a great time with my host Dan Gibson and his students Eric Thiesen and Lianna Vice, and thank them for their hospitality.

I then travelled to Whitehorse to give the Wolverine talk at Yukon College and the Yukon Geological Survey on March 27. There was a great audience and I thank Joel Cubley for his hospitality at the college and for hosting the talk. I was lucky enough to have some downtime in Whitehorse to hang out with my colleague Maurice Colpron and spend some time at the Yukon Geological Survey with my colleagues there, including Esther Bordet, Don Murphy, and Steve Israel. I thank Maurice Colpron for his hospitality and hosting me while in Whitehorse! The final leg of the western Canadian portion of the tour was at my alma mater, the University of British Columbia, where I gave the Wolverine talk on March 28. I had a really busy day with lots of meetings and discussions with students, faculty, and staff, and a lab tour of the Pacific Centre for Isotopic and Geochemical Research. I thank Matt Bodnar, Nikki Kovacs, Matt Manor, Fabien Rabayrol, James Scoates, Libby Sharman, and numerous members of the MDRU group for spending time with me and talking about their research while there. Murray Allen and Dominique Weiss are thanked for the invitation to talk, arranging the tour, and being my hosts while there. It was also nice to see the rainy spring in Vancouver before returning the St. John's ahead of a "spring" snowstorm!

The final stop on the tour for 2017 was at McGill University on April 7. I gave the Wolverine talk at McGill and the question session thereafter was the longest one on the tour covering a range of topics from volcanology, replacement process in massive sulfides, nutrient sources in the water column, basin redox, and genesis of massive sulfides. It was pretty stimulating and enjoyable. While at McGill I thank Vincent van Hinsberg, Nicolas Gaillard, Jethro Sanz-Robinson, Kyle Henderson, Noah Phillips, Peter Douglas, Galen Halverson, Bob Martin, Jim Clark, and Lyndsay Moore for spending time with me. Jamie Kirkpatrick is thanked for arranging things and sorting out my schedule, and Vincent van Hinsberg is thanked for being my host (and also thanks for the great EPS mug!).

Some final statistics for the tour:

Talks given: 12 Zn-rich VMS: 2 Wolverine: 8 Seafloor hydrothermal systems: 1 Tally Pond VMS: 1 Universities/sites visited: 11 Flight segments: 17 Train segments: 2 Total km traveled (estimate): 24,093 Lost items: 0 (unlike 2015-2016)!

Having completed two tours in two years, it is abundantly clear to me how many great people there are in Canadian geoscience. The numerous faculty, staff, students, government, and industry researchers that are undertaking outstanding research in all aspects of geoscience is amazing. It's been a pleasure and



View to north Whitehorse from Mount McIntyre

privilege to interact with so many of these people, to meet new people, and to learn from them. I really appreciated your hospitality and generosity! To others – if given the chance to do such a tour – do it!

I once again thank the GAC<sup>®</sup> for the chance to undertake the Hutchison Lecture tour. As always these tours have a lot of help behind the scenes from GAC<sup>®</sup> volunteers and staff and I owe special thanks to Alwynne Beaudoin (GAC<sup>®</sup> Tour Coordinator) for her logistical help, and Karen Johnston at GAC<sup>®</sup> headquarters for answering so many questions and her help with the travel planning!

See you all soon!

Steve Piercey Memorial University of Newfoundland

Tour summaries are also posted on the Economic Geology Blog at https://stevepiercey.wordpress.com/

## GAC<sup>®</sup>-PDAC Logan Student Prize Winners

Congratulations to the 22 recipients of the third annual GAC<sup>®</sup>-PDAC Logan Student Prize.

- Erik Petersen, Acadia University
- Chantal Norris Julseth, Brandon University
- Stephanie Kupers, Brock University
- Carolina Chang, Dalhousie University
- Chanelle Boucher, Lakehead University
- Robert Meek, Laurentian University
- Kassandra Sofonio, McGill University
- Josee Menard, McMaster University
- Sara Lilley, Mount Royal University
- Glenn Hall, Simon Fraser University
- Blanche Richer, Université du Québec à Chicoutimi
- Mélanie Beaudette, Université du Québec à Montréal
- Cole Evans, University of British Columbia Okanagan
- Hayley McIntyre, University of British Columbia
- Christian Sole, University of Ottawa
- John Kelley, University of Regina
- Katelynn Brown, University of Saskatchewan
- Evelyn Moorhouse, University of Toronto
- Michaella Yakimoski, University of Victoria
- Anna Pastega, University of Waterloo
- Grace Enns, University of Windsor
- Andres Cristancho, Vancouver Island University

The prize is awarded annually to one undergraduate student at each CCCESD-member department. The award has a monetary prize component, a one year memberships to both GAC<sup>®</sup> and PDAC, and recognition in the form of a certificate.

The selected students are expected to be academically sound, have good leadership skills (e.g., as they pertain to organizing field trips, geology club geo-events, etc.), and have done well at field school or otherwise show proficiency in field techniques. The prize recognizes students who are leaders and participate in advancing the study and application of geoscience. Students are usually in their final (i.e., graduation) year.

For more information, see: www.gac.ca/wp/?page\_id=11525



Chanelle Boucher receiving the GAC-PDAC Logan Student Prize from Andrew Conly, Lakehead University



Kassandra Sofonio, GAC-PDAC Student Prize winner, McGill University



Mélanie Beaudette receiving the GAC-PDAC Logan Student Prize from Normand Goulet, Université du Québec à Montréal

## The History of the Geological Survey of Canada in 175 Objects

As it celebrates its 175<sup>th</sup> anniversary in 2017, the Geological Survey of Canada can lay claim to a unique role in the exploration and development of Canada.

In 1842, 25 years before Confederation, its founder and first director William E. Logan began by assessing the mineral wealth of the Province of Canada and discovered an impressive range of mineral deposits. As Canada grew, the Survey reported on all aspects of its natural resources.

Travelling by horse, foot, or canoe – often through uncharted wilderness – its early scientists mapped, described, and recorded Canada's geology. Indeed, they were the government's "official" explorers. Their reports were influential. For example, they played a key role in recommending the route for the railways that linked Canada together as it expanded westward.

The Survey scientists collected rocks, minerals, fossils, flora, and fauna, as well as photographs and artifacts of indigenous peoples that they encountered in their wide-ranging travels. These formed the nucleus of a public museum started by Logan in Montreal in the 1840s and which was moved to Ottawa in 1881. In 1911, the Victoria Memorial Museum was built in Ottawa to house the Survey and its collections. The specimens and artifacts collected by Survey scientists are still part of the treasures held by our national museums. The early work of the Survey laid the foundation for the development of Canada's mineral and energy resources. In the 20<sup>th</sup> and 21<sup>st</sup> centuries, its national geological and resource maps, publications, and scientific studies have provided a significant stimulus for our expansion and growth.



Throughout its history, the Survey has maintained the highest standards of research. Its scientists have advanced international geoscience in fields such as seafloor spreading, tectonic plate movements, and paleomagnetism. They are also world leaders in the development of airborne geophysics. Recent contributions include new understanding of subduction zone earthquakes, groundwater and mineral deposits, climate change science, space weather forecasting, and seafloor mapping to delineate offshore boundaries.

The 175 objects were selected from suggestions made by Survey staff and alumni. They provide a glimpse into the Survey's 175-year-long history and its outstanding contribution to the development of Canada.

Access the presentation at science.gc.ca/eic/site/063.nsf/eng/h\_00006.html

[Editor's note: This item is extracted from the Introduction on the above website]

## **Announcements**

## 51<sup>st</sup> AESE Annual Meeting Yellowknife, Northwest Territories September 6 to 9, 2017

Mark your calendars! The 2017 annual meeting of the Association of Earth Science Editors will take place in Yellowknife, N.W.T., September 6 to 9, 2017.

Yellowknife is well known for its former gold mines and more recently for its diamond mines. It is also a worldclass location to observe well-preserved geological features and formations from the Late Archean Era. Many geological features, including pillow basalt, glacial striae and permafrost features, can be seen right in town. We hope that you will take some time to enjoy the region's many natural attractions, including its geological diversity, while attending the meeting.

AESE's meetings generally consist of two days of technical sessions and a one-day field trip. Please join us for a fun-filled and educational experience this September. Meeting headquarters will be the Explorer Hotel.

The meeting is open to anyone interested in earth science editing, publishing and outreach. The program is still in the planning stage. Watch for meeting updates on AESE's web page www.aese.org.

For more information, please contact Host Chair, Erin Palmer, erin\_palmer@gov.nt.ca.



Yellowknife skyline from the Pilots' Monument

## Canadian Paleontology Conference CPC 2017

The 2017 Canadian Paleontology Conference will be held in Calgary, Alberta, the weekend of September 29 - October 1.

To celebrate the 175<sup>th</sup> anniversary of the Geological Survey of Canada, the event is being organized by the GSC's Calgary office, together with the Alberta Palaeontological Society and with faculty and students of the University of Calgary (Department of Geoscience) and Mount Royal University (Department of Earth and Environmental Sciences).

An icebreaker will take place the evening of Friday, September 29, followed by oral and poster presentations on Saturday and Sunday. A banquet is being planned for Saturday night. Other events, including pre- and post-conference field trips and a public lecture, are also being considered. Please watch for a formal first circular, including venue and registration details, in the near future

## **Canadian Society of Vertebrate Palaeontology Conference 2017**

The 2017 meeting of the Canadian Society of Vertebrate Palaeontology will be held in Dinosaur Provincial Park, Alberta, May 15-17. Dinosaur Provincial Park was the first UNESCO World Heritage Site that was designated (in 1979) because of the importance of its fossil resources. Other treasures of the park include the largest stretch of badlands in southern Canada, the cottonwoods along the Red Deer River, and the sage flats with their distinct flora and fauna. The conference and accommodations will be in the middle of the badlands beside the river. There will be opportunities to hike in the park to see dinosaur guarries, bone beds and other abundant fossil resources. Dinosaur Provincial Park is near Brooks (southeast of Calgary), and it takes about two hours to drive there from Calgary. For more information please see https://csvp.ca/meetings/

Geological Association of Canada Second Annual Student Photography Award Winners



1st Prize in the GAC<sup>®</sup> Student Photography Competition: Sarah Pemberton Upper Mammoth Hot Springs Terraces, Yellowstone National Park, Wyoming USA. Mammoth has the largest carbonate depositing spring in the world, forming travertine terraces.



2nd Prize in the GAC<sup>®</sup> Student Photography Competition: Melissa Anderson Pahoehoe lava and volcanic cones on Pico Island, Azores

Volume 46, Number / Numéro 1, Spring / Printemps 2017



Joint 3rd Prize in the GAC<sup>®</sup> Student Photography Competition: Matthew Sommers Mount Assiniboine: Rising above the rest in the area at a staggering 3618 m, this Cambrian-aged giant is glistening as the day comes to a close.



Joint 3rd Prize in the GAC<sup>®</sup> Student Photography Competition: Sarah Pemberton Grand Prismatic Spring in Yellowstone National Park, Wyoming USA. The beautiful colours come from thermophile bacteria living in the geothermal waters

Congratulations to all our winners, and to everybody who entered. The standard of the competition was extremely high, and our judges had a difficult time picking out winners.

Prizes provided from Jérôme H. Remick III Endowment Trust Fund

## Announcing GAC<sup>®</sup>'s 2017 national award winners

### LOGAN MEDAL

The highest award of the Geological Association of Canada is presented to an individual for sustained distinguished achievement in Canadian earth science.

Roy Hyndman, Geological Survey of Canada (Pacific)

"For scientific leadership and sustained impact in the science of tectonics and

geodynamics crossing the boundaries of land and ocean, geology and geophysics, and fundamental research and societal needs."



### **HUTCHISON MEDAL**

Named after Dr. William W. Hutchison, the medal is awarded to a young individual for recent exceptional advances in Canadian earth science research.

Christie Rowe, McGill University

"Dr. Christie Rowe is awarded the medal for outstanding



contributions to Canadian earth science research on the geology and physics of earthquakes, the deformation of rocks caused by plate motions, fluidrock interactions, and the formation of ore deposits."

### NEALE MEDAL

Named after the legendary E.R. Ward Neale, the medal is awarded to an individual for sustained outstanding efforts in sharing earth science with Canadians.

Guy Narbonne, Queen's University

"Through a unique combination of exceptional scientific discovery and commitment to

public outreach, Professor Guy Narbonne, Queen's University, has brought the excitement of understanding the evolution of life to all Canadians, most notably through his promotion of the world-class fossil site at Mistaken Point."

Please join us at the GAC<sup>®</sup> Luncheon on May 15 in Kingston to see these prestigious geoscientists accept their awards. Congratulations to all medallists!

GeoFact: Jan 21 1751: Birth of Jacques-Louis de Bournon, mineralogist and one of the thirteen founding members of the Geological Society, in Metz, France. GeoFact: May 11 1752: Johann Friedrich Blumenbach, who described and named the mammoth from Siberian faunal remains, born in Gotha, Germany.

### 20

### AMBROSE MEDAL

The Ambrose Medal, named after the first GAC<sup>®</sup> President, J. Willis Ambrose, is awarded to an individual for sustained dedicated service to the Canadian earth science community.

Stephen T. Johnston, University of Alberta

**GEOLOG** 

"For two decades of continued service representing the interests and advancement of

Canadian earth sciences at every level on national and international committees, editorships and in the media."



PREMIER INTERNATIONAL CONFERENCE ON ENERGY • MINERALS • WATER • THE EARTH

## June 16-21, 2018

Vancouver Convention Centre

Vancouver, British Columbia, Canada

## EMPOWER A GENERATION -GET RESOURCEFUL

## Submit a session proposal by May 1, 2017

Grounded in our understanding of the Earth, this **first ever IUGS Inter-Congress Conference** will bring participants together from industry, government, academia, civil society and the next generation to discuss their initiatives and research related to the key resource issues shaping the future of energy, minerals, and water.

## TAKE THE CHALLENGE - CREATE A SESSION

The opening #RFG2018 Call for Sessions successfully focused the global community on resources and our collective commitment to a sustainable future. We invite you to join your colleagues by proposing new sessions on the five key themes:

SESSIONS

FOR

4

18

- The Earth processes that have led to and constrain resource availability
- · Energy future of energy needs, opportunities, and delivery
- Minerals discovery and clean extraction of mineral resources
- · Water source and management of water to meet societal needs
- Resources and Society sustainable development of resources to provide benefits for all

Contribute your vision for the future of geoscience, environmental science and engineering, and sustainable solutions - in the key themes, and especially at the interface between them. We want new innovative sessions that increase the scope of the conference.

## SUBMIT YOUR SESSION PROPOSALS BY MAY 1, 2017 AT RFG2018.ORG

### **9** Discovery

4-day technical program / 2,500+ oral presentations and poster sessions / Opening and theme-based plenaries

- Brown Short courses and field trips
- Community
  4,000 to 5,000 Canadian and international participants
- Exhibition 3-day trade show

Students & Emerging Leaders Dedicated sessions and events

Networking Knowledge exchange and business opportunities



### GEOLOG

## Volume 46, Number / Numéro 1, Spring / Printemps 2017

## **Howard Street Robinson Fund**

The Robinson Fund was established in 1977 by the Geological Association of Canada, using a bequest from the estate of Howard Street Robinson. The fund is dedicated to the furtherance of scientific study of Precambrian Geology and Metal Mining by:

- sponsoring an annual Distinguished Lecturer Tour whose focus alternates between Precambrian research and economic geology (lecturer alternately chosen by the GAC<sup>®</sup>'s Precambrian and Mineral Deposits divisions)
- supporting Special Projects including publications, symposia and conferences.

Proposals for special projects on Precambrian Geology or Metal Mining should be submitted to the Robinson Fund Committee. Projects should be sponsored or organized through the GAC<sup>®</sup> or one of its Divisions or Sections. Proposals that have a wide appeal or degree of accessibility to the GAC<sup>®</sup> membership are preferred.

For further information and proposal submissions, please contact: Patrick Mercier-Langevin, Chair, Robinson Fund, c/o Geological Survey of Canada, 490 rue de la Couronne, Québec G1K 9A9, Tel: 418 654-3101, E-mail: pmercier@nrcan.gc.ca

### The Last Word

Choosing just 175 objects to tell the complex story of the Geological Survey of Canada must have been a formidable task (p. 16). The online exhibit is fascinating. Browsing images of fieldwork and instrumentation brings home how much things have changed in 175 years. A small specimen of gold collected from the Yukon by J. B.

### Information for Contributors

Contributions should be submitted by e-mail to Alwynne.Beaudoin@gov.ab.ca, with GEOLOG in the subject line. Contributions are welcome in either of Canada's two official languages. MS Word (.doc or .docx) is the preferred format for contribution but generic word processing (.rtf or .txt) files are also fine. Please do not submit PDF files. Up to four hi-res images may be submitted per contribution: preferred format is .jpg, RGB colour, with a minimum 300 dpi resolution at 5" x 3" size. Please ensure that images are cropped and colour-corrected, and provide a caption for each image, and an image credit line if needed. Contributors are responsible for securing permission to publish for any third-party images or images of living recognizable people. Diagrams (vector graphics) may also be submitted. Preferred format for graphics is Adobe Illustrator (.ai); make sure that the file is saved with "save text as lines" option enabled to ensure no font substitutions. Additional information on other file formats can be obtained from the Editor. Please do not embed images or graphics in your text document; images or graphics should be submitted as separate files. In your text, use a call-out in parentheses to indicate the approximate placement of each image and graphic. If files are larger than 10 mb, please contact the Editor for alternate delivery arrangements. Your contribution will be copy-edited to ensure consistent spelling and orthography and to correct any obvious typos or errors. Contributions may also be edited for clarity and length. If the Editor has questions about specific information in the text, she will contact contributors for clarification. Contribution deadlines are March 1, June 1, September 1 and December 1.

Tyrrell in 1898 provides a direct connection to geologists of the past. As does the first object: Henry de la Beche's letter of recommendation for William Logan, who was hired in 1842 as the first staff member of the Geological Survey of Canada. I'm looking forward to hearing more GSC history at GAC-MAC in Kingston. Alwynne B. Beaudoin, *GEOLOG* Editor

#### Consignes aux auteurs

Les contributions d'auteur doivent être soumises par courriel à Alwynne.Beaudoin@gov.ab.ca, en indiquant GEOLOG à la rubrique Objet. Les articles seront acceptés dans l'une des deux langues officielles du Canada. Les fichiers de format MS Word (.doc ou .docx) sont préférables, mais les formats génériques (.rtf ou .txt) sont aussi acceptables. Veillez ne pas soumettre de fichiers au format PDF. Par article, jusqu'à quatre images haute résolution peuvent être soumises; format préféré est .jpg, couleurs RVB, avec un minimum de 300 PPP en taille 5 po x 3 po. Veillez vous assurez que les images sont recadrées et leurs couleurs corrigées, qu'elles sont accompagnées d'une légende ainsi que des informations de référence le cas échéant. Il est de la responsabilité des auteurs d'obtenir la permission de publier toute image de tiers ou de personne reconnaissable. Des diagrammes (graphiques vectoriels) peuvent également être soumis. Le format préféré pour les diagrammes est celui d'Adobe Illustrator (.ai); assurez-vous que le fichier est sauvegardé avec l'option « Sauvegarder le texte comme ligne » activée pour éviter toute substitution de police de caractère. On peut obtenir des informations sur d'autres formats de fichiers en communicant avec l'éditrice. S'il vous plaît ne pas incorporer d'images ou de graphiques dans votre texte; ces images ou graphiques doivent être soumis sous forme de fichiers distincts. Dans votre texte, veillez utiliser des notes numérotées entre parenthèses pour indiquer l'emplacement approximatif de chaque image et graphique. Dans le cas de fichiers dépassant 10 Mo, veuillez contacter l'éditrice pour convenir des modalités de téléchargement. Vos articles seront révisés afin d'en assurer la cohérence orthographique et corriger les fautes de frappe ou erreurs évidentes. Les articles pourront aussi être corrigés pour plus de clarté et éviter des longueurs. Dans les cas où l'éditrice aurait besoin d'informations particulières concernant le texte, elle communiquera avec les auteurs. Les dates limites pour soumettre des articles sont le 1 mars, le 1 juin, le 1 septembre et le 1 décembre.