



Winter 2019

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THE MAIN THRUST

***NEWSLETTER OF THE CANADIAN TECTONICS GROUP DIVISION OF THE
GEOLOGICAL ASSOCIATION OF CANADA***



Saint-Martyrs-Canadiens 2018 CTG Workshop

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1. GAC has a new website!

After a bit of down time, the Geological Association of Canada is back online in full force with their new website <https://gac.ca>. Update your bookmarks! If you have feedback on the new site (things you like, things that are ‘not your favourite’), please let me know and I’ll forward those comments on to GAC. Obviously, if you have similar feedback on our own site, I would love to hear that too. The link to our page from GAC is under About GAC/Divisions.

2. 2018 Canadian Tectonics Group Annual Workshop

The Canadian Tectonics Group (CTG) held another successful annual workshop from September 28 to 30th, 2018, where 55 participants met in a rustic setting near Saints-Martyrs-Canadiens, located in the Appalachians about 35 km southeast of Victoriaville, QC. The conference was held at Camp Beauséjour, on Lac Sunday, situated in the heart of the Thetford Ophiolite Complex. Camp Beauséjour is where Alain runs his annual geological mapping field school for UQAM undergraduates. This was the 38th such workshop since CTG’s formation in 1981, and was organized by Alain Tremblay (UQAM), Morgann Perrot (UQAM) and David Corrigan (GSC Ottawa). The participants represented a broad slice through the Canadian tectonic community from Halifax to Victoria, with a very healthy participation of graduate and undergraduate students from the more geographically proximal Quebec- and Ontario-based universities, as well as across Canada. Overall, eleven Canadian universities were represented, as well as Government Survey geologists and retired and emeritus researchers.

A large number of participants drove to the conference, whereas others flew to Montreal airport, from where they were shuttled to Camp Beauséjour. On the Friday evening, participants assembled, posters were set-up and numerous joyful discussions were held over refreshments. On Day 1, twenty oral presentations were heard, organized under four broad themes: 1- Lithosphere/Geophysics; 2- Mineral Exploration and Related Themes; 3- Tectonics; 4- Tectonostratigraphy and Rheology. The talks were held in a quaint wooden chapel on a knoll amid spruce trees and white birches, within the campgrounds. The day started on a very high note with an enlightening 40 minutes keynote presentation by Herb Helmstaedt (Queen’s U., emeritus), entitled “Structural and tectonic considerations in decyphering the evolution of primary diamond deposits”. Everyone was commenting on the high quality and relevance of talks that were heard throughout the day, ranging in scope from the lithospheric- to thin section scale, and from empirical observation to modeling. Posters were displayed in the large cafeteria where breakfast, lunch and dinner were served. On the Saturday evening a special banquet was held in honour of Herb Helmstaedt, where he received the Canadian Federation of Earth Sciences (CFES) Award for Mentorship. For the occasion, a méchoui dinner (beef roasted on a spit) was served at the camp by a local restaurateur. The banquet highlighted numerous anecdotes from participants who have had

the pleasure of interacting with Herb during his long and illustrious career at the Department of Geological Sciences and Engineering at Queen's.



Herb Helmstaedt receiving the CFES Mentorship award from Shoufa



“Preaching from the pulpit”, Herb presenting his keynote talk on diamond deposits

Day 2 got underway early Sunday morning with a drive along Highway 112 southwestwards towards the Ordovician Ascot Complex volcanic arc in the Sherbrooke area. Of the five stops planned we were only able to complete three, due to unforeseen logistical reasons, but those that we did manage to do were very much worthwhile. The first stop brought us to the “Big Hollow Brook” section of the La Guadeloupe fault, along which Silurian and Devonian rocks of the Gaspé Belt are thrust over the Ascot Complex. At that location, nicely developed shear bands showing top-to-the-NE sense of shear are formed in hanging wall metasediments as well as in the footwall granite mylonites. Stop two consisted of a large, recently blasted road section on an abandoned highway access ramp, where ductile shear affects felsic and MORB-type mafic lavas of the Stoke Domain. As with the outcrops of Stop 1, these rocks also displayed a variety of meso- to micro-scale reverse fault (top-to-the-NNW) shear sense indicators. The originally planned stops 3 and 4 were skipped, and we drove directly to the last

formal field trip location. Stop 3 (officially numbered '5' in the Program, Abstracts and Field Guide book) consisted of a spectacular set of road cut outcrops showing multiple generations of crenulation in pyrite-bearing black shales. The black shales, previously interpreted as being in fault contact with adjacent metavolcanic rocks of the Ascot Complex, are now interpreted as being in depositional contact with the latter.



Crossing Big Hollow Brook on the way to the La Guadeloupe Fault at Stop 1

After lunch, an optional visit to the historical Capelton Mine was offered to participants, namely those who did not have to be shuttled back to Montreal airport or drive back home over long distances. “*L’épopée de Capelton*” is a privately owned venture that offers guided tours to what is the oldest VMS mine in Canada, in operation from 1863 to 1907. Access to the three uppermost levels of the mine has been recently completed, with wooden stairs and railings leading to the various tunnels and workings. Structures that folded – and likely enriched – the massive sulphide lenses can be observed.

The field guide and the program-with-abstracts volume may be downloaded from the CTG website at <http://www.canadiantectonicsgroup.ca/workshops.html>. At the business meeting we learned that next CTG Workshop (2019) will be held in Western Newfoundland, and will be organized by John Waldron. We look forward to seeing everyone next year on ‘The Rock’.

See you in October 2019!

Alain Tremblay, David Corrigan and Morgann Perrot

3. Students: apply for a grant of up to \$600 to attend GACMAC in Quebec City, May 12-15.

CTG will once again provide support to enable two students to attend the GACMAC Meeting. Priority will be given to a student or students who are presenting talks or posters on a tectonics and structural geology-related topic, and who wish to attend a field trip or short course (see Section 3 below). Students should contact the CTG Chair (dawn.kellett@canada.ca), attaching a copy of a submitted abstract, together with a short cover letter including:

- A budget of the costs associated with attendance, including travel, and other sources of funding available;
- A statement indicating why you wish to attend the meeting and field trip, and how you expect to benefit from them;
- A transcript or transcripts of your academic record.

Deadline: February 28, 2019

4. We are looking forward to a rich and diverse tectonics and structural geology program at the upcoming 2019 GACMAC conference, Quebec City, QC.

CTG SPONSORED SESSIONS

The construction and use of P-T-t-D paths in understanding orogenic systems (SS-GH5) Leaders and affiliations: Kyle Larson (University of British Columbia); Chris Yakymchuk (University of Waterloo); Brendan Dyck (Simon Fraser University)

Recent advancements in analytical procedures such as laser ablation split stream and garnet geochronology, as well as computational techniques such as phase equilibria modelling, have made it possible to generate incredibly detailed pressure-temperature-time-deformation (P-T-t-D) paths for orogenic systems. These advancements also allow researchers to examine many more specimens than previously possible. The enhanced fidelity and density of data has begun to shed light on the processes active during orogenesis including the derivation of their tectonic 'fingerprints'. This session seeks submissions that cover the technical advances that make constructing P-T-t-D paths possible and the new insights about orogenic systems that are gained from them.

Crustal melting, migration, and mineralization processes: Partial melting through fractionation to volatile saturation, from the micron to the continental scale (SS-GH6) Leaders and affiliations : Matthew Steele-MacInnis (University of Alberta); Brendan Dyck (Simon Fraser University); Zeinab Azadbakht (University of New Brunswick); Ed Sawyer (UQAC)

The formation, segregation, migration and fate of crustal-derived melts have major impacts on a variety of geologic processes including the petrologic and tectonic evolution of the continents, chemical cycling in orogenic settings, and concentration of lithophile elements such as Sn and W to form ore deposits. These phenomena involve complex

coupling of geochemical and physical processes over a wide range of scales – from the micron scale of melt generation at grain boundaries, to the continental scale of collisions and orogeny. To unravel these processes crucial to the evolution of Earth’s crust requires integration of many types of observational data (including field mapping, microtextural analysis, geochemistry and geophysics), experimental results, and numerical modeling. This session focuses on the origins, physical-chemical properties, and geological processes driven by crustal melting and the presence of crustal melts. The session aims to bring together geoscientists with diverse perspectives on crustal melts, including (but not limited to) geochemistry and petrology, tectonics, geophysics and geodynamics, and economic geology. Topics covered in this session include: 1) Melting – the recognition and consequences of wet versus dry melting, fertility of various rock types, and compositions of melts produced; 2) The fluid dynamics (or lack thereof) of anatectic melts – the segregation and movement of melt in and through the crust; 3) Making granitic magmas – from melting reactions, to restite-unmixing, contamination/entrainment of crystals, magma mixing and fractionation; 4) Crustal-derived magmas in ore-forming settings – magmatic and hydrothermal processes leading to concentration of metals, vapor saturation, compositions of fluids produced and circulated, and ore precipitation; 5) Tectonic and geodynamic processes and consequences of partial melting – the reworking of continental crust into its present gravitationally stable, compositionally layered state. The session welcomes contributions that address these topics using approaches including field-based and analytical studies, experiments and theoretical modeling.

Melt, fluids and architecture of accretionary orogens (SS-GH15) Leaders and affiliations: Dawn Kellett (Geological Survey of Canada); Sandra Barr (Acadia University); Graham Layne (Memorial University); Donnelly Archibald (St. Francis Xavier University)

Accretionary orogens are construction sites of continental growth, with addition of crustal material occurring via magmatism and accretion. Accretion results in a dense network of crustal-scale structures which form critical pathways for magmas and fluids. This coincidence in space and time of heat, melt, and crust-penetrating structures leads to formation of diverse ore deposit types, making accretionary orogens important exploration targets. In this session, we welcome novel field and analytical-based contributions on the evolution of magmatism, fluids, and structures in accretionary orogens, particularly in the context of the tectonic setting of ore deposits.

Open session on the Appalachians and Grenville geology (SS-GH16) Leaders and affiliations: Michel Malo (INRS); Anne-Aurélié Sappin (Geological Survey of Canada)

Quebec City is located at the junction between two major geological provinces of Eastern Canada, the Grenville and the Appalachians. Ideas and concepts on the tectonic evolution of these two provinces have changed strongly in recent years thanks to numerous mapping by provincial and federal geological surveys and research works in universities. Acquisition of new data more and more precise of geochronology, isotopic geochemistry, seismic, remote sensing, airborne geophysics, and other technologies has allowed to improve our knowledge on the geological history of these two provinces and review their potential for mineral and petroleum resources. This session seeks of bringing together recent contributions in all Earth sciences disciplines to get new insights on the geological history and economic interest of the Appalachians and the Grenville.

Ophiolites as markers of oceanic and orogenic settings (SS-GH17) Leaders and affiliations : Jean Bédard (Geological Survey of Canada); Alain Tremblay (UQAM)

Ophiolites are central to the reconstruction of orogen evolution, record the palaeo-tectonic environment of lost oceanic basins, reveal evidence of the complex magmatic-hydrothermal systems that create and modify the rocks of the oceanic lithosphere, and host several types of economic mineral types. Detailed studies of important ophiolite facies, their significance and evolution through time, and broader syntheses of their role in orogenesis are all welcome. A post-meeting fieldtrip will introduce participants to representative magmatic, sedimentary, structural and metamorphic facies of the Thetford-Mines ophiolitic complex and associated strata in the Appalachian Orogen. This is part of IGCP Project 662.

Pannotia to Pangea: Paleozoic orogenic cycles in the circum-North Atlantic region: a celebration of the career of Damian Nance (SS-GH18) Leaders and affiliations: Brendan Murphy (St. Francis Xavier University); Rob Strachan (University of Portsmouth); Cecilio Quesada (Instituto Geológico y Minero de España)

The hypothesis that the cyclic amalgamation and breakup of supercontinents has existed for the past 2.5 Ga has a profound implications for the evolution of the Earth's systems. The proposed special session is intended as a celebration of the career of Damian Nance, who was an integral part of the research team that initially proposed the existence of such a cycle more than 30 years ago. We are soliciting presentations which focus on topics and processes related to formation and breakup of supercontinents, the amalgamation of Pannotia/Gondwana, the generation and destruction of Paleozoic oceans, and the development of the Appalachian-Ouachitan-Caledonide-Variscan orogens. The session will be co-sponsored by IGCP 648 (Supercontinent Cycles and Global Geodynamics) and will draw a large international gathering to the conference to celebrate Damian as well as the advances in our understanding of supercontinents over the past 30-35 years. As an outcome of this special session, we will be soliciting contributions to a publication (venue to be decided) in Damian's honour.

Quantifying timing and rates of geologic processes (SS-GH20) Leaders and affiliations: Eva Enkelmann (University of Calgary)

Geochronological and thermochronological techniques provide critical temporal controls on the evolution of Geosystems and their interactions. This session invites contributions from scientists that use a wide variety of dating techniques to determine the timing of geologic events and to quantify the rates of geologic processes ranging from millions to billions of years. The session will focus on both methodological studies aiming to further advance existing methods and develop new dating techniques, as well as a variety of geologic applications. We invite contributions of geologic studies that use both, geochronology and thermochronology methods to study processes occurring in the lithosphere as well as detrital analyses using a variety of methods to investigate the provenance and thermal history of sedimentary strata.

Is Venus, modern Earth, or another planetary body the best analogue for the early Earth?— Implications for Archean tectonics and mineralization (SS-RE8) Leaders and affiliations: Lyal Harris (lyal.harris@ete.inrs.ca) INRS; Robert Stern, University of Texas; Matthew Leybourne, Queen's University; Jean Bédard, Geological Survey of Canada

The session will combine presentations and discussion of the results of field and analytical studies in Archean belts with geophysical, planetary geology, and numerical and analogue modelling research examining different tectonic models. Outcomes have implications for mineral exploration in Archean terrains as current ore deposit models are based on the plate tectonic paradigm.

Reservoir geomechanics and structural geology (SS-RE10) Leaders and affiliations: Elena Konstantinovskaya (konstant@ualberta.ca), University of Alberta, Edmonton

This session is looking for abstracts that address applied reservoir geomechanics and structural geology techniques providing a new structural understanding of reservoirs and highlight new modeling approaches from regional to pore-scale. Submissions that emphasize how integrated structural and geomechanical analyses contribute in hydrocarbon exploration and production for conventional and unconventional hydrocarbon systems are of particular interest. Research and industry case studies related to structural and geomechanical aspects of geothermal/waste/CO₂ storage projects are welcome.

CTG SPONSORED FIELD TRIPS

The Charlevoix impact structure and seismic zone Leaders and affiliations: Léopold Nadeau (Geological Survey of Canada (retired)), Gordon Osinski (University of Western Ontario) –*pre-conference trip, 1 day*

The Thetford Mines ophiolite and its orogenic context Leaders and affiliations: Jean Bédard (Geological Survey of Canada), Alain Tremblay (UQAM) –*post-conference trip, 2.5 days*

CTG SPONSORED SHORT COURSES

Rates and dates: Geo- and thermochronology methods and applications

Leaders and affiliations: E. Enkelmann (University of Calgary), William Matthews (University of Calgary) –*post-conference, 1 day*



5. 39th CTG Fall Workshop in 2019

Our upcoming 2019 fall workshop will be organized by John Waldron and Dawn Kellett, in coordination with GAC's Newfoundland section. In its 39 years, the CTG has never been to Newfoundland. Western Newfoundland was prominent in the development of plate tectonic theory as applied to orogenic geology and remains a much visited region of Canadian tectonic heritage.

The meeting will take place in the Deer Lake-Corner Brook region of western Newfoundland, in September or October. As usual, precise dates are still being considered, and should be announced by the GACMAC meeting in May.

Because of the considerable travel distance for most participants, there will likely be 1 or 2 days of additional field trips on top of our usual workshop.

I am still looking for volunteers to organize a “central Canada” CTG meeting for our 40th anniversary of the Canadian Tectonics Group fall workshop. The success of this division depends on our contributions. Please consider organizing a great 40th anniversary meeting. I'll organize the t-shirts ☺ -Dawn

6. Winners of Jack Henderson awards for best theses

We are very proud of our 2017 Jack Henderson best thesis recipients:

PhD thesis prize:

Jeremy Powell, University of Ottawa for his thesis: “*Burial and Exhumation History of the Mackenzie Mountains and Plain, NWT, Through Integration of Low-Temperature Thermochronometers*”, supervised by David Schneider

MSc thesis prize:

Kelian Dascher-Cousineau, McGill University for his thesis: “*The Evolution of Fault Slip Surfaces with Displacement*”, supervised by Jamie Kirkpatrick

Congratulations to both winners and their supervisors, and thanks to all our readers!

7. Winner of the David Elliott Best Paper award

The Dave Elliott award for best paper in Canadian structural geology and tectonics, with publication year 2017, was awarded to:

Jordan McDivitt, Bruno Lafrance, Daniel Kontak and Lise Robichaud, for their paper entitled “*The Structural Evolution of the Missanabie-Renabie Gold District: Pre-orogenic Veins in an Orogenic Gold Setting and Their Influence on the Formation of Hybrid Deposits*” published in *Economic Geology*, 2017, volume 112, 1959-1975. Congratulations to Jordan and co-authors!

Many thanks to those who read papers and submitted nominations. Without your time and effort this award would not be possible.

Forthcoming Dave Elliott Best Paper Award

We are calling for submissions for the 2018 Dave Elliott Best Paper Award. Your councillors will prepare a shortlist of papers written *by authors based in Canada or dealing with Canadian topics and with a publication date in the 2018 calendar year*. Priority will be given to peer-reviewed publications. Submissions from the membership are also welcome and should include a PDF file of the paper in PDF format. Submissions by the authors will also be considered. We will appoint a small committee of individuals not involved with any of the shortlisted papers to review the shortlisted papers and select a winner. These submissions should be sent before **March 1, 2019** to: Dawn Kellett (CTG Chair): dawn.kellett@canada.ca

8. CTG Business Meetings

Business meetings of the CTG were held at the Resources for Future Generations (GAC-MAC) meeting in Vancouver, BC, and at the CTG workshop in Saint-Martyrs-Canadiens, Quebec in 2018. Minutes are included below.

The next CTG business meeting will be held at the GACMAC meeting in Quebec City, QC in May 2019.

CTG business meeting Vancouver, BC; June 2018

Date: June 19, 2018
Location: Vancouver Convention Centre room 302-303
Present: 15 members
Meeting Chaired by: Dan Gibson, past vice-chair
Minutes taken by: Joel Cubley

The meeting was called to order by Dan Gibson at 5:10 PM.

1. Approval of Minutes of last meeting at CTG, Kelowna (see accompanied document)

- Minutes were circulated prior to the meeting by email.
- Motion to approve the minutes was moved by: Deanne van Rooyen
 - Seconded by: Cathy Bethune
- The motion to approve the minutes was carried in a vote with two abstentions, John Waldron and Joel Cubley, who weren't present at the Kelowna meeting.

2. Matters arising, not covered below

No new business matters were raised.

3. Treasurer's report (Submitted by A.V. Okulitch)

Treasurer's Report: Fiscal Year, June 2017 – June 2018

Opening balance:	-	\$ 2 667.61
Paper statement fees:	-	\$ 36.00
Deposit fees:	-	\$ 3.00
Website (Starter and 10 year subscription)	-	\$ 270.00
Best paper prize for 2016:	-	\$ 200.00
Student travel grant for 2017:	-	\$ 600.00
Best MSc thesis prize for 2016:	-	\$ 200.00
Interest:	+	\$ 2.39
Membership fees for 2016:	+	\$ 1 225.82
Membership fees for 2017:	+	\$ 1 330.00
Membership fees for 2018:	+	\$ 1 455.00
Closing balance:	+	\$ 5 371.82

Notes:

\$ 500.00 cheque for the best PhD thesis for 2016 was cashed late in the previous fiscal year.

\$ 600.00 cheque for a second student travel grant was cashed late in the previous fiscal year.

Outstanding cheques for best PhD and MSc thesis prizes and best paper prize for 2017, and the student travel grant for 2018 total \$ 1 500.00 .

- Multiple years of income were provided by GAC this year. Moving forward, GAC will provide each year's support in January. If CTG is owed any money for 2018, it will come in the next month or so.
- GAC divisions will now be audited, and GAC HQ will pay for the audit expenses.

4. Awards

a. GAC Student support:

- Carol-Anne Généreux, a Ph.D. student in the Harquail School of Earth Sciences at Laurentian University was awarded this year's student support grant. Carol-Anne was in attendance and accepted her award. Photographs of the award presentation were taken by John Waldron and Shoufa Lin. The \$600 grant was awarded to subsidize the student's participation in the RFG meeting and a field trip.
- Faculty need to be reminded to encourage their students to apply. There were a low number of applications for the grant this year.

b. Dave Elliott award for best paper:

- The annual Dave Elliott best paper award of the Canadian Tectonics Group was presented to Jordan McDivitt (Laurentian University/University of Western Australia), Bruno Lafrance (Laurentian University), Daniel Kontak (Laurentian University) and Lise Robichaud (Ontario Geological Survey) for their paper entitled "The Structural Evolution of the Missanabie-Renabie Gold District: Pre-orogenic Veins in an Orogenic Gold Setting and Their Influence on the Formation of Hybrid Deposits." The paper was published in *Economic Geology* (v. 112, p. 1959-1975, 2017).
- Jordan McDivitt was unable to attend RFG 2018, and his co-authors weren't at the CTG meeting. Dan Gibson will meet with Dan Kontak during the RFG meeting to present him with the award certificate. The cheque was previously sent to Jordan. Carol-Anne Généreux (Laurentian University) sends Bruno Lafrance's thanks for the award – he is very pleased to have received the accolade.

c. Jack Henderson prizes for best theses:

- The PhD best thesis prize was awarded to Jeremy Powell (University of Ottawa) for his thesis "Burial and Exhumation History of the Mackenzie Mountains and Plain, NWT, Through Integration of Low-Temperature Thermochronometers." The thesis was supervised by David Schneider at the University of Ottawa. Jeremy was in attendance at the meeting and received his award from Dan Gibson. Photographs of the award presentation were taken by Shoufa Lin and John Waldron.
- The MSc best thesis prize was awarded to Kelian Dascher-Cousineau (McGill

University) for his thesis “The Evolution of Fault Slip Surfaces with Displacement.” The thesis was supervised by Jamie Kirkpatrick at McGill University. Kellian did not attend RFG 2018, but Jamie Kirkpatrick accepted on his behalf.

5. CTG fall meeting 2018 announcement & future workshop planning

2018 CTG Workshop, Quebec Appalachians, Eastern Townships, QC

- This year’s CTG Annual Meeting and field trip will take place in the Quebec Appalachians in the Sherbrooke area, Eastern Townships, QC., on September 28-30. The principal organizers are David Corrigan (GSC) and Alain Tremblay (UQAM). The meeting will be held at Camp Beauséjour near Saint-Martyrs-Canadiens, which is about a 25-minute drive southeast of Victoriaville. For those arriving by plane, the organizers will arrange for transport from Dorval (P.E. Trudeau) airport. Camp Beauséjour offers relatively rustic accommodations by a private lake. There are several dorm-type cabins that can take 4-6 people each, and a limited number of motel-style rooms. Bedding can be supplied, especially for those who will fly in, but it is recommended that attendees bring their own sleeping bags/pillow if they drive to the meeting. Accommodation rates are projected to be very reasonable (about \$85/person for two nights including meals; \$105/person with supplied bedding). The organizers will make arrangements for a banquet dinner on the Saturday evening at additional cost, to be included in the meeting fees.
- The meeting will start on the evening of Friday September 28th with an Ice Breaker reception and a talk introducing the local geology. Saturday will be a day of oral and poster presentations, followed by a banquet. The banquet will celebrate Herb Helmstaedt (Queen’s U.), who is receiving a mentorship medal from the Canadian Federation of Earth Sciences (CFES). On Sunday morning there will be a field trip focusing on the stratigraphy and structure of the Ordovician Ascot Complex volcanic arc and overlying Magog Group forearc deposits. The trip will progressively head west towards the Sherbrooke area. After lunch there will be an optional visit of the Capel VMS Mine, which closed in the 1930s but has been nicely restored for guided visits. The tour lasts about 2 hours and can take up to 20 participants. Depending on interest the organizers will determine if there is a need to arrange two back-to-back tours.
- Further information, including registration details, will be posted in the coming months on the CTG website.

2019 CTG Workshop Planning

- John Waldron is interested in leading a CTG field trip to Newfoundland in the fall of 2019. This would be based out of the Marble Mountain ski resort near Corner

- Brook. There are obvious logistical challenges in getting to Newfoundland. The field trip highlights would be local ophiolite sequences and the Bay of Islands.
- John's fallback plan would be a trip in Nova Scotia focused on the Minas Fault Zone. He has run trips there previously, and the locations are easily accessible. Highlights include deformed late Paleozoic sedimentary rocks and wave-cut platforms on the Bay of Fundy.
 - A straw poll was taken and attendees were leaning heavily towards Newfoundland. J. Conliffe raised possible funding opportunities to offset costs of a Newfoundland meeting. Shoufa Lin recommended lengthening the meeting to justify the trip; e.g. tacking on an additional day or two of field trips.

Future International Field Trips and/or Workshops

- The possibility of an international CTG meeting was brought up at the Kelowna meeting, with Nepal and southern Spain suggested as possible locales.
- Attendees at this meeting were concerned with international meetings for a number of reasons:
 - There are issues with liability and insurance. David Corrigan has had issues in the past running field trips in the Adirondacks. It was suggested that Patrick Sack at the Yukon Geological Survey (YGS) be contacted; he successfully ran a cross-border field trip into SE Alaska for the Whitehorse GAC Meeting in 2016.
 - An international field trip might be prohibitively expensive for some regular CTG attendees. The goal of the division is to increase participation. Students might be less inclined to go, and it would be impossible for them to travel abroad in the middle of a term.
 - Several attendees wanted to keep the focus on Canadian geology and accommodating students.
- John Waldron suggested a partnership with the Structural Geology and Tectonics (SGT) Forum. This meeting is held in the summer, and a principal contact would be Yvette Kuiper at the Colorado School of Mines.

6. GAC 2019 – Quebec City. CTG sponsorship of Special Sessions

- There are two proposed sessions from GAC 2019 that have clear linkages to CTG:
 - *Is Venus, modern Earth, or another planetary body the best analogue for the early Earth?—Implications for Archean tectonics and mineralization*
 - Session conveners: Lyal Harris (INRS-ETE); Robert Stern (UTexas); Matthew Leybourne (Queen's U.); Jean Bedard (GSC)
 - The session will combine presentations and general discussion of the results of field and analytical studies in Archean terrains with geophysical, planetary geology, and numerical and analogue modelling research. Outcomes have implications for mineral exploration in Archean terrains as current ore deposit models are based on the plate tectonic paradigm.

- *Melt, fluids and architecture of accretionary orogens*
 - Session conveners: Dawn Kellett (GSC); Sandra Barr (Acadia U); Donnelly Archibald (St. FX); Graham Layne (MUN)
 - Accretionary orogens are construction sites of continental growth, with addition of crustal material occurring via magmatism and accretion. Accretion results in a dense network of crustal-scale structures which form critical pathways for magmas and fluids. This coincidence in space and time of heat, melt, and crust-penetrating structures leads to formation of diverse ore deposit types, making accretionary orogens important exploration targets. In this session, we welcome novel field and analytical-based contributions on the evolution of magmatism, fluids, and structures in accretionary orogens, particularly in the context of the tectonic setting of ore deposits.
- The call for sessions has officially closed, but the conference organizers are still keen on getting more proposals.
- If sessions are out there that are CTG-related, please let Dawn Kellett know and sponsorships might be arranged.

7. Other business

No additional items were raised.

A motion to adjourn was raised by Deanne van Rooyen, and seconded by John Waldron and Cathy Bethune.

The meeting was adjourned at 5:38 PM.

CTG business meeting Kelowna, British Columbia; October 2017

(Minutes remain unofficial until approved at a following business meeting.)

Date & Time: September 29, 2018 at 5:00 pm

Location: The chapel, Saint-Martyrs-Canadiens, QC

Number of eligible members present:	11
Meeting chaired by:	Dawn Kellett (chair)
Minutes taken by:	Christie Rowe

Move to open meeting: Mary Louise Hill

1. Approval of Minutes of last meeting at CTG, Vancouver (see accompanied document)

Minutes were circulated by email.

Motion to accept minutes of previous meeting

MOVED by John Waldron

SECONDED by Kathy Bethune

- The motion to approve the minutes was carried in a vote.

2. Matters arising, not covered below

No new business matters were raised.

3. Treasurer's report (Submitted by A.V. Okulitch)

Available funds are \$3861.87 as of end August. Balance includes 2 outstanding cheques totalling \$400. Upcoming expenses: \$1200 student field trip grants + \$600 best paper plus thesis awards.

GAC is auditing their records; in the spring we received 3 years worth of membership dues. We now have \$3461, accounting for the outstanding cheques.

4. Awards

a. GAC Student support:

Call for applications ahead of GAC MAC abstract deadline in early 2019 – two \$600 awards, remind your students to apply! For student who is presenting at GAC to attend field trip. Look into making it easier to do application for the field trip scholarship along with the abstract submission instead of separate process via registration web site – Dawn will contact GAC to inquire about this. Can student use it for CTG? Yes for next year since it might be more remote/expensive. David: there is a profit built in to this meeting. Dennis: we did the same at Bracebridge – it can be rolled back to CTG fund or donate toward GAC funds, student travel, charitable donation. Does GAC ask for donations to foundation when you renew membership? Nobody remembers. Dawn to find out from James Conliffe.

b. Dave Elliott award for best paper: *reminder that we rely on councilors to review the literature from the previous year, and anyone can nominate a paper they think was noteworthy (including self-nominations).*

c. Jack Henderson prizes for best theses:

Reminder to submit your students' theses in early 2019. Call goes out in Feb for nominations for 2018 completed theses. Dhazi is organizing.

5. CTG fall meeting 2019 announcement 2019 CTG Workshop, Cornerbrook, NFLD

Will be organized by John Waldron and Dawn Kellett. Shawna White will also contribute to organization. Looking for support/involvement from Nfld CTG community, and exploring funding sources for student attendance. Will be first fall meeting in Nfld in the history of CTG and SG&T.

Proposal for a fall field meeting of the CTG in Western Newfoundland

The CTG has never been to Newfoundland. Western Newfoundland was prominent in the development of plate tectonic theory as applied to orogenic geology and remains a much visited region of Canadian tectonic heritage.

A verbal proposal for the 2019 fall meeting received strong support at the annual meeting of the CTG in June 2019. John Waldron has agreed to be an organizational lead.

Venues

The meeting, as usual, would consist of one full day or two half days of field trips, plus one full day or two half days of talks. Suitable venues exist in the Deer Lake - Corner Brook region, where fall meetings of a conference on western Newfoundland Oil and Gas have attracted similar audiences to the CTG (20 - 60 participants). That meeting has been held at Marble Mountain Ski area, Humber Village Resort, and at the Glynmill Inn Hotel in Corner Brook. Any of these would be a suitable venue.

Alternative venues exist in the Stephenville – Port au Port area, and have been used by GACMAC field trips, but these are a long drive from Deer Lake airport: delayed flights could lead to long drives to ferry delegates to/from the airport. Stephenville airport has minimal scheduled service at present.

Potential field trip destinations:

1. Port au Port Peninsula - Authochthon and Humber Arm Allochthon (mainly sedimentary rocks), basin inversion, folds, thrust faults, petroleum. Furthest point 2 hr drive from Corner Brook
2. North and south shores of Humber Arm - deformed sedimentary and volcanic rocks of the Humber Arm Allochthon. Furthest point 1 hr drive from Corner Brook.
3. Ophiolite: Upper Mantle harzburgite tectonite overlain by crustal gabbros; pillow lavas of Skinner Cove assemblage. Both are 2 hr hikes on marked trails or barren ground.

Trip 3 has less structural content but for most Canadians is their only chance to see an intact ophiolite. The proposal that found most favour at the annual meeting was to extend the meeting by one day in order to include destination 3 as a possibility for delegates wishing to stay longer to see more geology. The regular one-day trip on Saturday or Sunday would then be destination 1 or destination 2 (which cover some of the same material).

Benefits:

CTG has never been to Newfoundland before.

Waldron has field guides for trips to destinations 1 and 2 derived from previous trips he has led with GACMAC and with WNL Oil and Gas meetings.

Fall is low season at the Marble Mountain ski area: we may get a deal.

Minivans can be rented from Deer Lake Airport. Marble Mountain is close (< 30 min)

GAC Newfoundland section runs a fall field trip and may wish to combine operations. Destination 3 might gain input from Gros Morne National Park if held early enough in the fall.

Challenges:

Travel will be a challenge especially for delegates from western Canada.

Eastward travel to Newfoundland typically takes a whole day from most places in central and western Canada, though on most days several flights are available into Deer Lake with Westjet, Air Canada. Less frequent flights are available from Porter airlines or Provincial Airlines (PAL).

Outward travel to most parts of Canada can typically be accomplished during an evening, thanks to the time differences. However, travel out after 4 pm is typically possible on only a single evening flight, which is often heavily booked in advance. Delegates leaving in the evening will have to book early and/or stay until the next morning. We would need to investigate holding a block booking with an air carrier, and/or some kind of charter booking.

Destination 2 is tide-dependent, especially at one locality which must be visited within 30 min of low tide. This will require careful planning and may dictate dates to some extent.

Weather challenges are present in all destinations in Canada. In general the fall weather in western Newfoundland is reasonable, but there is always the possibility that a trip may be affected by remnants of a tropical storm, as these do reach Atlantic Canada occasionally.

Delegates driving at night or dusk will need to be warned of the risk of collisions with moose.

NOTES: how can we get more funding for students to fly? Are there more NFL based membership who might get involved in organization? Want at least 2 days of field trip if you go all that way. 2 field trip days 1 day of talks?

JW: challenges include: getting there, fly to Deer Lake. Can't get prices yet for Oct 2019. Flights are not very frequent – may need to book a block of seats on flight in advance. Two possible venues: Marble Mt ski area which is 20 min from airport – more posh but offseason could be reasonable. Other option: drive 2 hrs to tip of Port au Port Peninsula to Inn at the Cape. B&B has 9 rooms + bunk house. Field trips: a mostly sedimentary field trip on Port au Port peninsula including megathrust at base of Humber Allocthon and overturned section in footwall ; Gros Mourné ophiolite and oceanic moho. Involves half hour hike and can do deformed continental margins rocks along the way. Also could do west of Cornerbrook there are lots of folded and deformed cont margin rocks.

Some universities are doing fall reading week (week after thanksgiving). Perhaps start meeting Weds night, Thurs-Fri field trips, Sat talks, half day Sunday field trip and get done by mid-day. Could switch around to allow people to leave early if they have farther to go home. Thanksgiving is late next year so the Weds to start might be October 16. Could allow field trip days to be set spontaneously once weather is known.

Central participants have been asked to think about proposing a location and LOC for the 2020 meeting. Shawna nominates Metal Earth for 2020 field trip

Lyal: going to SGTs in US and Australia. They happen every other year but for 4-5 days. US one is supported by NSF. NFL might attract some Brits. Dawn: this is for students to give first talks, if we skip years we will miss whole cadres. Could have first question every talk asked by students. More student talks.

6. GAC 2019 – Quebec City. CTG sponsorship of Special Sessions – May 13-15

Lyal Harris has proposed the special session:

"Is Venus, modern Earth, or another planetary body the best analogue for the early Earth?—Implications for Archean tectonics and mineralization."

Session convenors: Lyal Harris, INRS-ETE, Québec, Robert Stern, U Texas, Dallas, Matthew Leybourne, Queen's, Kingston, Jean Bédard, GSC, Québec

Dawn Kellett has proposed the special session:

"Melt, fluids and architecture of accretionary orogens"

Session convenors: Dawn Kellett (GSC), Sandra Barr (Acadia U), Donnelly Archibald (St. FX), Graham Layne (MUN)

Eva Enkelmann has proposed:

Quantifying timing and rates of geologic processes

Elena Konstantinovskaya has proposed:

Reservoir geomechanics and structural geology

7. Other business

Need nominees for new chair and vice chair. JW points out that vice chair should roll into chair. JW nominates DZ for chair. It's not that much work (they lie). The big jobs are the awards. That election would be in the spring at the GAC. We are lucky to have Jurgen and Andrew as permanent (?) secretary and treasurer.

Phil Simony was just awarded AAPG distinguished educator award! Lizelle has photos of him with his big group of students going back to 1960. Can we post on webpage?

CTG chair and vice-chair positions up for renewal in spring.

Meeting adjourned: TIME: 6:10 pm

9. Current CTG Executive and Councillors

Chair: *Dawn Kellett*, GSC, Dartmouth

Vice Chair: *Dazhi Jiang*, University of Western Ontario, London

Secretary: *Jürgen Kraus*, Mortal Oil Ltd. Calgary

Treasurer: *Andy Okulitch*, Geological Survey of Canada (Vancouver)

Councillors:

Kathryn Bethune, University of Regina, Regina

Normand Goulet, Université Québec à Montreal

Lyal Harris, Institut national de la recherche scientifique, Québec

Mary Louise Hill, Lakehead University, Thunder Bay

John Waldron, University of Alberta, Edmonton

Joseph C. White, University of New Brunswick, Fredericton

Laurent Godin, Queen's University, Kingston

Dan Gibson, Simon Fraser University, Burnaby

Deanne van Rooyen, Cape Breton University, Sydney

Camille Partin, University of Saskatchewan, Saskatoon

Shoufa Lin, University of Waterloo, Waterloo