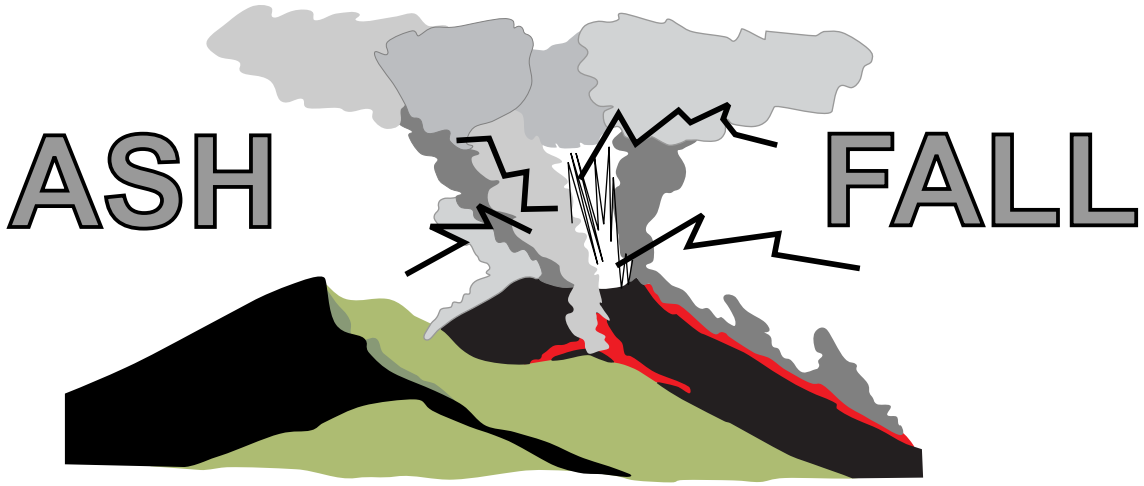


Newsletter of the Volcanology and Igneous Petrology Division Geological Association of Canada

No. 86 January 15, 2024

In this issue

2023-2024 VIP Executive

A message from the VIP Chair

My first year as the VIP Chair has been busy but made much easier by the dedicated members of the VIP and the VIP Division executive. I would like to start by thanking all VIP executive members both past and present. Our secretary/treasurer Zsuzsanna Magyarosi continues to hold VIP together. Thanks to outgoing VIP Chair Michelle DeWolfe who wrapped up her two-year term in May. Pete Hollings continues to keep the website updated for us. Ian Coulson stepped up and is the current vice-chair. I would like to welcome two new members to the executive including Fazilat Yousefi (Councillor East) and Kiersty Malay (Student Councillor). Our past outreach coordinator Zeinab Azadbakht helped with VIP webinars and looking after our outreach on our social media sites. We appreciate the time and effort put in by our regional councillors and others who have helped adjudicate our three student thesis awards and the Career Achievement Award. Later in this issue we have information about our 2022 award winners. We have vacancies in our Councillor West and Outreach Coordinator positions so if you would like to get involved, please contact a member of the executive.

The 2023 GAC-MAC meeting was hosted by Laurentian University in Sudbury on May 24–27, 2023 with many sessions and several pre- and post-meeting field trips and workshops supported by VIP. The VIP Division supported a session entitled "Iron-rich critical mineral deposits: genetic processes and feedback mechanisms between magmatism and metasomatism" that was chaired by Wyatt Bain, Louise Corriveau and Jean-Francois Montreuil. We also provided promotional support to several other sessions.

As many of you may know if you attended the past few AGMs, we had significant difficulty in dealing with our past supplier of our division awards. However, I located a new supplier in Halifax, and I hope to have everything ready to go early in 2024.

There are several upcoming meetings with VIP content. The Atlantic Geoscience Society Colloquium will be held in Moncton, New Brunswick on February 2-3, 2024. Included is a special session in honour of a long-time VIP member and supporter Sandra Barr (Acadia University) entitled "From Ocean Crust to Mountain Peaks: A Celebration of the Career of Sandra Barr". Another session entitled "Igneous-hydrothermal systems and critical metals in the northeast" also promises to have VIP-related content. Check out the host website for more information (https://atlanticgeosciencesociety.ca/colloquium-2024).

The upcoming GAC-MAC meeting will be held in Brandon Manitoba from May 19-22. Included in the joint meeting in 2024 is the 10th International Symposium on granitic pegmatites with several field trips and special sessions dedicated to pegmatite research. There are many other sessions that I am sure will be of interest to VIP members as well. Check out the host website for more information (https://event.fourwaves.com/gacmac2024/pages).

I would like to send out a special thank you to Dave Lentz. He was active on the VIP executive for at least the past eight years right up to the day (and even after) his term ended as past chair. He continues to advocate for and promote VIP activities within the Canadian and global geoscience communities. I would like to thank Dave for all his time and dedication to the VIP Division.

Finally, we continue to welcome new and continuing members of GAC and VIP, as well as invite everyone to contribute to future Ashfall and GAC GEOLOG newsletters. We are interested in all activities related to VIP and to spread the word about this GAC Division. Hope to see you in Brandon! However, if you are not able to make it to Brandon, we invite you to the hybrid AGM in May.

All the best in 2024!

Donnelly Archibald (2023-2025 VIP Chair)

Career Achievement Award

The Volcanology and Igneous Petrology Division of the Geological Association of Canada in recognition of career achievements in the field of volcanology and/or igneous petrology present the Career Achievement Award. Candidates are judged on their lifetime scientific contributions.

Dr. Jean H. Bédard for his lifetime scientific contribution to the fields of Volcanology and Igneous Petrology

Nomination Letter

It is with great pleasure that I write this letter to propose the attribution of the 2023 Career Achievement Award to Dr. Jean H. Bédard. I highly recommend Dr. Bédard based on my professional and personal interactions with him during the last 25 years. Dr. Bédard is currently achieving a more than 30 years-long career as research scientist at the Geological Survey of Canada (GSC). Jean has an impressive record of detailed petrological\geochemical studies and geological mapping of various igneous rock sequences in a great number of different paleogeographic and tectonic environments. He is an international-recognized specialist of the petrology of Phanerozoic ophiolites, flood basalt sequences and related continental magmatism, and genesis of Archean crustal sequences.

In parallel to field-based studies, Jean Bédard conducted a series of theoretical analyses and studies on the modeling of mantle melting, fractional crystallization, and related compositional variations of mineral compositions and trace elements coefficient distributions. His competency and skills in petrology and geochemistry are reflected by his scientific publications record (annexed to the present letter) in international journals such as GSAB, EPSL, J. Petrology, Chemical Geology, Geochem. Cosmochem. Acta, CJES, etc., for which he acted, most of the time, as the sole and\or the first author (for more than 50% of articles). Jean Bédard maintained an impressive number of 3-4 full-reviewed papers/year since the beginning of his career (for a current total of 101 publications). This is an excellent level of contributions, well above the average production of academics and national surveys geoscientists in North America. Besides this, he also published a total of 45 internal GSC publications in the form of geological maps and current research reports. He also regularly participated in national and international geological conferences and published a total of 286 abstracts since the 80's, 40% of them as the first author.

Apart from his research and administrative duties at the GSC, Jean has been involved, as a supervisor or co-supervisor, in the research projects of 17 graduate students: 11 M.Sc. and 6 Ph.D. from various universities in Québec (Laval, INRS-ETE, UQAM), Ontario (Ottawa, Carleton), British Columbia and United Kingdom (Cardiff, Bristol). He has been external examiner on 19 occurrences for M.Sc. memoirs and Ph.D. theses and predoctoral exams from different universities, both at the national (Dalhousie, Laval, Laurentian, INRS, UQAM, Polytechnic-Montréal) and international (Denmark, France) levels.

His expertise is recognized worldwide, and he has been invited as formal reviewer for 286 submitted scientific papers since 1989, excluding here the large amount of internal informal reviews he performed for his GSC and INRS colleagues at the GSC-Québec (*i.e.* former Quebec Geoscientific Centre). More recently, he has been on the editorial board of the Geological Society of America Bulletin and handled 72 manuscripts since 2006. Enclosed you'll find Jean's curriculum vitae (updated to January 2023) with all the details regarding his scientific research axes and publications.

In summary, I think that the attribution of this Career Achievement Award to Jean Bédard would be consistent with the scientific maturity and the research excellence that he has achieved over the years, and there is no doubt in my mind that he fully deserves such an honour.

Yours sincerely,
Alain Tremblay, full professor
Département des Sciences de la Terre et de l'Atmosphère, Université du Québec à Montréal

Acceptance letter

I thank the Volcanology and Igneous Petrology Division of the GAC for this immense honour. I especially thank my friend Alain Tremblay for his nomination letter, and am touched by all the nice things he said about me. As a career iconoclast it comes as a bit of a shock to realize that I have become an elder scientist, but hopefully not yet a fossil. I like to think that age has not erased my rebellious tendencies and still think that challenging the assumptions that underpin the dominant model is an excellent way to move science forward, though it does make waves.

I discovered geology at Collège Édouard Monpetit in 1972-3. In contrast to the boring and often incomprehensible professors in Physics and Chemistry, Michael Lyons (my charismatic Geology prof) had long hair and was cool. I had never before seen a prof wearing buckskin and moccasins walking on the class tables as he delivered dynamic lectures. I devoured the Introduction to Geology book and loved how it made the land come alive for me. I realized had found my natural calling and milieu and applied to do geology at McGill. The McGill Geology Department was like a large family of peculiar uncles and cousins where I obtained an unparalleled formal education that has served me ever since, while my summers working for industry provided essential field experience and paid for my schooling. In my first season I worked with a drill crew and an Inuit family in Ungava. Two weeks in, I was thrown into the deep end when my boss left on holiday, leaving me in charge. One of the drillers broke his hand and had to be evacuated. We ran out of bits. The radio didn't work well (my nickname was Radar), and the drillers were skeptical when I would tell them to stop drilling. But since they wanted to rehire me the next year I guess I managed OK. This was the life of adventure I had been seeking. I rode in helicopters and floatplanes, learned how to build a camp, do grid mapping, log core, chase bears barefoot and unarmed at night; and Johnny Agnatuk taught me how to throw rocks with a sling! How cool is that!

After a winter hitching around Europe and the Middle East I returned (slightly less ignorant) to McGill to do an MSc with Andrew Hynes in the Cape Smith belt of Ungava. He and Don Francis accepted me as a student, even though they knew me well. These were amazing years of learning with many friends. Mapping and sampling the Chukotat volcanics and their layered feeder sills launched me into the world of igneous petrology, and I can't thank Andrew and Don (also Willie Jones) enough for their inspiration and tutelage in critical thinking.

Montreal in the 80s with my circle of friends was too wonderful to leave so I crossed the mountain for a PhD at Université de Montréal with John Ludden (1981-85) on the geochemistry of the Monteregian Hills alkaline rocks (learning the 999 names of syenite). While there I met Steve Sparks who had come to give a talk, and we hit it off. Steve offered to sponsor me, and when my NSERC post-doc application was successful, Johnny Canuck was off to Cambridge (1986-87). I was in paradise. There was a talk every day, with over 100 PhD students, post-docs and visiting scientists to interact with at morning coffee. While there I shared a gothic cottage with the vicar's son in a graveyard. Great Halloween parties but rotten neighbours.

Steve Sparks was a wonderful mentor. He brought me to the Azores to sample pyroclastic rocks, arranged that I should visit Greenland for a NATO Layered Intrusion workshop where I met all the illuminati, and helped me develop an experimental study of magma chamber mush zones with Herb Huppert's team at DAMTP (Dept. Applied Mathematics and Theoretical Physics). Stephen Hawking would take afternoon tea in the DAMTP common room, so though we never sat at the same table I can almost truthfully say that I had tea with him. More importantly, I went with Steve, Bob Hunter and their students to Rhum (Inner Hebrides), where we speculated that the peridotite layers might be intra-cumulate sills. This was exciting stuff, since it would overthrow the universally accepted magma chamber replenishment model. Somewhat to my surprise I found that my hard-earned field skills from 5 seasons in Canada were invaluable and allowed me to prove that the peridotite layers were indeed sills. Even better, the field evidence implied the gabbros were metasomatic replacements of troctolites. Although many considered me a lunatic at the time, and many still do, intra-cumulate sills and reactive percolation of melt are now considered important processes in the oceanic crust. For the students reading this, the take-home message is that field skills are important, even in the age of isotopes and AI.

The Geological Survey of Canada hired me and I moved to Ottawa in 1988, proud to join one of the premier geoscientific organizations in the world. I want to thank the many GSC managers who have dealt with me over the years for their support and patience. I also gratefully acknowledge the lab technicians and support staff at the Geological Survey and INRS, because good science needs good data. My first GSC project was the Bay of Islands ophiolitic complex (BOIC), seeking the same sort of relationships I had seen on Rhum in oceanic cumulates. I was hooked immediately. Ophiolites were proxies for ocean ridge processes and fundamental building blocks of orogens, and the rocks of BOIC blew my mind, changing everything I thought I knew about igneous processes. I also fell in love with Newfoundland, which became a second home (my daughter Rhya was brought up and studies naval engineering there). In 1990 I moved to the Québec GSC office to work on more ophiolites with Réjean Hébert (Laval U) and later with Alain Tremblay of INRS, because I knew I needed input from a structural geologist. I learned a lot from Alain and later Cees van Staal and Alex Zagorevski as we studied ophiolites across Canada and around the world.

I maintained a parallel research track on cumulates and flood basalts and learned much from workshops organized by Alex McBirney. In 2005 I realized another of my dreams when I went to the Dry Valleys of Antarctica for a workshop on the Ferrar sills led by Bruce Marsh. Later (2008-11), with Keith Dewing and Rob Rainbird, I studied the Franklin sills and Natkusiak lavas on Victoria Island, a place of stunning beauty. This was a wonderful experience in teamwork as each of us brought our cortège of scientists and students who constituted the mapping crew (too numerous to mention here, but thank you all). One of the high points for everyone was the chance to get to know the people of Ulukhaktok. I am grateful for their hospitality and wish especially to thank my friends Susie Memogama and Joseph Inuktalik. In 2015 Keith Dewing invited me and my colleagues from Uppsala (Valentine Troll and Frances Deegan) to participate in another multi-discipline study (ongoing) of sills on Ellesmere and Axel Heiberg Islands, allowing me to get as far north as I had been south.

Experience with ophiolites had given me a good appreciation for what oceanic terranes and orogenic belts were like, so in 1998 I felt ready to tackle the Archaean, collaborating with the Québec Government, who were mapping the NE Superior. At the time everyone except a few crazies believed that modern-style plate tectonics characterized the Archaean (I did too), but after 4 seasons with follow-up petrology and geochemistry, I became a heretic as nothing resembled what I had seen in Phanerozoic belts. Later, François Leclerc approached me and Lyal Harris (INRS) to do a PhD in the Abitibi Greenstone Belt, where we showed that none of the calc-alkaline volcanic suites resembled modern arc magmas. Archaean plate tectonics was a myth and an alternative model was needed. As the hypotheses cascaded, I literally could not fall asleep for the ideas that kept popping into my head. We proposed that Archaean continents moved because of basal traction against their lithospheric keels, such that Archaean orogenies could occur without need of subduction zones. With this new paradigm in mind, Lyal used the Venus Magellan data to demonstrate 1000 km motions of continent-sized blocks causing orogenies on a planet without arcs and ridges. When he walked into my office and showed me his structural map my jaw dropped. Here was an actualistic Venusian example of the non-uniformitarian model we had posited for the Archaean Earth. We then proposed that the Western Superior was not the result of sequential terrane amalgamation driven by subduction, rather, it represented NeoArchaean fragmentation and reassembly of a pre-existing craton as a result of a mantle overturn. While recent work has been providing increasing support for non-plate tectonic interpretations, in the early 2000s a thick skin was needed, as these heretical proposals led to epic arguments that honed my debating skills.

I lost 2019 to Mr. C, but as I was recovering (gracias to Susie Gaudreault), I came up with a cunning pre-retirement plan. Carl Guilmette (Laval U.) had asked me to return to Bay of Islands to share my experience of these rocks with his students, and this sparked the idea of a gestaltic field workshop to incite external scientists to study these rocks with us. Thanks to Carl, GAC-Newfoundland, Alana Hinchey of GSNL, my manager Réjean Couture and Parks Canada staff (K.Oravec & S.Stone), we had a successful 30-person field BOIC workshop in 2022, and a 2nd in 2023. This has led to a biblical (as in loaves & fishes) multiplicity of ongoing non-linear interactions and collaborations, which will transform our understanding of how the oceanic lithosphere forms, and give me something to do in my idle hours in the future.

Looking back, I got exactly what I wanted when I chose geology. A life of travel and adventure, with good companions and fascinating puzzles to solve. I have been very lucky.

Jean H. Bédard
Geological Survey of Canada

Ph.D. Award, Dr. Gabriel Sombini dos Santos, University of Waterloo

Nomination Letter

We would like to nominate Dr. Gabriel Sombini dos Santos for the Léopold Gélinas Gold Medal for his PhD thesis entitled "Petrology, Tectonic Setting, and Regional Implications of the Ophiolitic Liuyuan Complex, NW China". He started his Ph.D. work at the University of Waterloo in September 2018 and successfully defended his thesis in December 2022. The thesis was co-supervised by Drs. Shoufa Lin, Cees van Staal and Jean Bédard.

The Liuyuan Complex is a major mafic unit at the southern edge of the Central Asia Orogenic Belt (CAOB) in northwestern China. Even after decades of study, the internal stratigraphy and tectonic setting of the Liuyuan Complex remains controversial, with authors proposing that it formed as a continental rift or a supra-subduction zone ophiolite. This debate has major implications for some key questions on CAOB, in particular on the timing and location of the final closure of the Paleo-Asian Ocean. For the thesis research, Gabriel mapped the Liuyuan Complex for two field seasons and produced the first detailed map of the complex (at a scale of 1:25,000).

The thesis starts with a detailed description of the field relationships of the igneous facies that comprise the Liuyuan Complex (Chapter 2), dividing them into subordinate gabbroic rocks and plagiogranite, separated from the volumetrically dominant basalt by a well-developed and laterally continuous sheeted dyke complex, which indicate they form part of an ophiolite. This is the first time sheeted dykes are described in the Liuyuan Complex. Based on petrography, whole-rock and mineral geochemistry, and thermodynamic modelling, Gabriel concludes that the basalts follow a typical tholeiitic crystallization sequence of olivine + plagioclase + clinopyroxene + ilmenite, with a relatively high initial water content. Field relationships with the coeval volcanic arc rocks of the adjacent Ganguan Complex and trace element fingerprinting of the basalts further indicate they formed in a fast spreading back-arc basin.

Chapter 3 focuses on the petrology of the gabbroic rocks of the Liuyuan Complex, dividing them into troctolite, melatroctolite, olivine gabbro, podiform olivine gabbro, podiform hornblende gabbro, and intrusive hornblende gabbro. Through detailed petrography, whole rock geochemistry, mineral chemistry and trace element modeling, Gabriel concludes that the gabbroic rocks are consanguineous with the overlying basalt, with the troctolite and olivine gabbro forming as progressively more evolved cumulates, and the melatroctolite as primitive replenishments into a crustal magmatic chamber. He further concludes that amphibole in the podiform hornblende gabbro formed by local increases in the water content in the pore-melt within the larger olivine gabbro. He also proposes that the podiform olivine gabbro and intrusive hornblende gabbro record quasi-liquid compositions, representing samples of trapped melts that fed the overlying sheeted dykes and basalt. The mineral chemistry of these gabbroic rocks is also consistent with the back-arc setting inferred from the composition of the basalts.

Chapter 4 presents geochronology of plagiogranites and a leucocratic gabbro, dividing magmatism in the Liuyuan Complex into an Artinskian (290-280 Ma) and a Roadian (275-269 Ma) phases, respectively associated with spreading and incipient arc magmatism following inversion of the back-arc basin. Gabriel presents a model where the Liuyuan Complex initially formed between 290 and 280 Ma by spreading in a back-arc basin to the recently discovered Ganquan arc. Magmatism in the Ganquan arc ceased by 280 Ma as a result of its collision with an outboard terrane (the Baidunzi Complex), at which point subduction stepped-back into the Liuyuan back-arc basin, such that part of the back-arc oceanic lithosphere becomes part of the upper plate (forearc) of the new subduction system.

Following progressive retreat of the arc due to slab rollback, the Liuyuan Complex is transformed from its new forearc setting into basement to a 275-267 Ma magmatic arc, before being finally obducted by 267 Ma onto the Ganguan Complex after final closure of the back-arc basin.

This thesis represents an excellent example of how the integration of detailed field work, petrography, whole-rock geochemistry, mineral chemistry, geochemical modelling, and geochronology can be used in conjunction to not only solve problems in igneous petrology but to provide major contributions to the tectonics of an accretionary orogen. Two of the chapters in this thesis have been published, in the Geological Journal (Chapter 4) and the Geological Society of America Bulletin (Chapter 2), respectively. A third manuscript based on Chapter 3 will be submitted to the Journal of Petrology soon.

In summary, we believe that the high-quality work Gabriel produced in his PhD thesis makes him an excellent and deserving candidate for the Léopold Gélinas Gold Medal.

Yours sincerely,
Shoufa Lin, Cees van Staal and Jean Bédard

Acceptance letter

I would like to thank the Volcanology and Igneous Petrology Division of the Geological Association of Canada for selecting my Ph.D. work to receive the Léopold Gélinas Gold Medal. This is a tremendous honor, and I'm truly grateful. I would like to thank my supervisors, Shoufa Lin and Cees van Staal for conceiving this Ph.D. project and for selecting me to carry it out in the first place. Many thanks to Jean Bédard for invaluable support in the field and back at the office, and for introducing me to a whole new world of the petrology of mafic cumulates and mineral-melt reactions. These past four years have been quite the adventure, and I could not have wished for better mentors and guides. This Ph.D. project taught me an incredible amount about ophiolites, mafic cumulates, and the tectonics of accretionary orogens. I feel very lucky and extremely grateful to have had the opportunity to work on it. I would also like to thank Elson Paiva de Olivera and Ricardo Perobelli Borba for the early encouragement to embrace my passion for geology and igneous petrology back in Brazil.

Many thanks for Sandra Barr, Chris White, and Deanne van Rooyen for doing the very same for me here in Canada. A heartfelt thank you to Tong, Yueting, Quinn, Thiago, Ludovico, and Zach for the friendship and company during my time in Waterloo and in Liuyuan. Finally, my endless appreciation to my parents, Edson and Vera, without whom none of this would have been possible.

Gabriel Sombini dos Santos

M.Sc. Award
Natashia Drage
Dalhousie University

Nomination Letter

I am very pleased to submit the M.Sc. thesis entitled "An Experimental Study of the Effect of Pressure on the Formation of Chromite Deposits" by Ms. Natashia Drage for consideration of the Gélinas Silver Medal.

The major focus of Natashia's thesis was to conduct laboratory experiments to validate models for the formation of chromitites associated with stratiform intrusions, which are the most significant mineable deposits of the element Cr. The specific focus was the chromitites of the Bushveld Complex. Several models have been put forward to explain these unusual rocks, but surprisingly few experimental studies have been done to validate any of them. Natashia's work tests the hypothesis recently put forward in the literature that decreasing pressure expands the chromite liquidus field relative to the ferromagnesian silicates or plagioclase, resulting in a chromite-only crystallization interval at low pressure.

The study involved both low and high pressure phase equilibrium experiments on model Bushveld parental magma compositions, as well as chromite solubility experiments at known oxygen fugacity (fO_2). Although control of fO_2 for high temperature experiments at ambient pressure is straightforward, this is not the case at high pressure, for which conventional methods involving graphite-gas equilibrium are pressure dependent. Therefore, Natashia had to employ an unconventional method of fO_2 control involving the use of custom-made capsules made from Fe-Ir alloys, with the capsule composition carefully adjusted to maintain constant relative fO_2 at each pressure investigated.

In addition to the phase equilibrium and solubility measurements, Natashia also used her experimental results to test the accuracy of the MELTS thermodynamic model, which has been widely used to model the liquid line of descent of mafic magmas, including the crystallization of chromite.

Her results show that the solubility of chromite is essentially independent of pressure, and that the most important control on chromite formation is the crystallization temperature of orthopyroxene, which is an important "sink" for Cr in mafic magmas. The MELTS thermodynamic model does not include chromium as an orthopyroxene component, and therefore tends to overestimate the crystallization interval of chromite.
The results of Natashia's work indicate that a very small pressure interval of chromite-only crystallization is possible at low pressure for Bushveld parental magma compositions, but this would require unusually high Cr concentrations. Other processes that involve mechanical sorting from magmas co-crystallization chromite and silicate minerals seem more likely for the formation of massive chromitites.
I certainly hope that the committee will agree that Natashia's thesis is worthy of the Gélinas Silver Medal, as it represents a very novel contribution to understanding the origin of chromitites, with a specific focus on the world's largest Cr deposits of the Bushveld Complex.

Yours sincerely,
James M. Brenan
Killam Professor of Earth Sciences and Department Chair

Acceptance letter

I am honoured to receive the Léopold Gélinas Silver Medal for my master's thesis and would like to thank the Volcanology and Igneous Petrology Division of the Geological Association of Canada for reviewing my work and awarding me this medal. I would also like to thank my supervisor, Prof. James Brenan, for nominating me and for his guidance and encouragement throughout my degree. It was a great pleasure to learn the workings of experimental petrology from James. I am thankful for the financial support provided for this project by the Geological Society of America, the Society of Economic Geologists, NSERC, the Nova Scotia Graduate Scholarship program, and the Killam Predoctoral Scholarship program.

Finally, I would like to thank the faculty, research staff, and students in the Department of Earth and Environmental Sciences at Dalhousie for their ongoing support.
Thank you again to GAC-VIP, it is a great privilege to be recognized for this work.

Natashia Drage

B.Sc. Award
Monet Streit
Acadia University

Nomination Letter

The deadline extension announced yesterday allows me to submit Monet Streit's BSc thesis entitled "PETROGRAPHY AND GEOCHEMISTRY OF EARLY CARBONIFEROUS VOLCANIC ROCKS IN THE NORTHEASTERN COBEQUID HIGHLANDS, NOVA SCOTIA" to be considered for the Gélinas Bronze Medal. In spite of a very difficult year of unfortunate circumstances, Monet was able to finish her thesis and produced a commendable product, as you will see from the attached pdf. To provide some background, last summer she was not able to complete as much field work as we had hoped because she contracted COVID, which lasted for most of August, the planned field time. She was just getting moving in the Fall term when she fell and had a concussion (early October). Under doctor's orders, she was able to do very little for most of the Fall term – not allowed to even use her computer for a few weeks! Subsequently she had trouble with concentration and memory into January. She managed to pull enough together to present a poster at the Atlantic Geoscience Society meeting in early February – for which she won the award for the best undergraduate student poster. Shortly after returning from the conference, she again contracted COVID. And after that recovery, in March a close family member died unexpectedly. I was amazed at her resilience – she finished her courses with honours level grades and her thesis.
Monet plans to pursue her interest in volcanic rocks by travelling to New Zealand and undertake M.Sc. studies there. If she can shake the bad luck, I expect her to do very well – she works hard and has abundant initiative as well as intelligence. Thank you for considering her thesis.

Regards,
Sandra Barr

Acceptance letter

I am extremely grateful to receive the Gélinas Medal for my B.Sc. thesis and would like to thank the Volcanology and Igneous Petrology Division of the Geological Association of Canada for this recognition. I found the research process to be enjoyable and extremely rewarding. Conducting this research has prompted my enthusiasm for further work in igneous petrology.

I would like to acknowledge the late Dr. Trevor MacHattie for his work which was a tremendous contribution to my thesis.

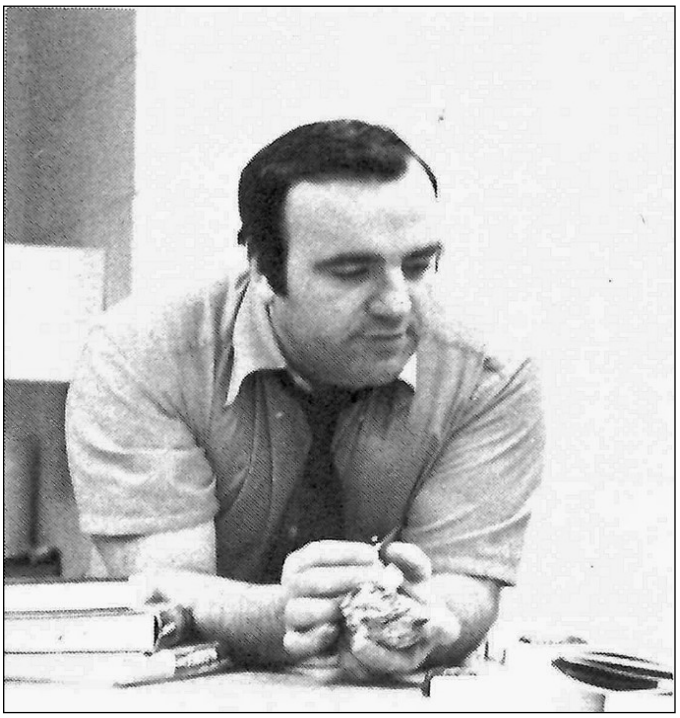
I also thank Dr. Sandra Barr for nominating me for this award. She has been an inspiration and a fantastic mentor who imparted knowledge and advice onto me throughout my research.

Monet Streit

Professional Obituary for Mr. Robert (Bob) Morse
(December 28, 1935-September 23, 2023)

Many Canadian geoscientists will be saddened to learn that their high school geology teacher, Mr. Bob (Robert) Morse passed away on September 23, 2023. His geoscience education accomplishments deserve acknowledgement by our community. Bob received his B.Sc. (Chemistry and Mathematics) and Bachelor of Education (B.Ed.) from Acadia University in 1968. He took first-year Geology courses which instilled a passion for the Earth Sciences. Cobequid Educational Centre (CEC) in Truro Nova Scotia opened in September 1970, and Bob was hired to teach a high school geology course. Whether he lobbied to have the CEC geology lab built, or helped design it, is lost in time, but his widow (Ruth Morse) noted that a house-full of rock and mineral samples went with him to CEC and he tasked friends to bring back samples from their world-wide adventures. The course he designed at CEC was rigorous and reflected the one he took at university. In addition to course development, he stocked the lab with samples and equipment second to none.

In 1978, J. Burns (B.Sc. Geology, B.Ed., M. Ed.) took over teaching Geology at CEC and he notes that "I was fortunate to teach in one of the best equipped Geology labs in the Maritimes. My students certainly benefited from the many resources that were procured during Bob's years in the school" (personal communication 2023). What Bob built was extraordinary, but his teaching was similarly exceptional. His teaching and enthusiasm were inspiring, his classes fun and entertaining, and the high-level of instruction provided exceptional preparation for university. Today, university educators lament the lack of geoscience education in the school system. Bob was one of the first, if not the first person to deliver a high school geology course in Atlantic Canada, making him a pioneer. Please celebrate the life and geoscience education accomplishments of Mr. Robert Morse.



Bob Morse holding a rock sample in his Cobequid Educational Centre lab, 1973 (from the 1973 CEC yearbook; used with permission).

Acknowledgements: The Acadia registrar's office retrieved Morse's archived transcript information. Ms. D. McLaughlin (CEC) gave a link to the on-line CEC yearbooks (https://cec.ccrce.ca/) and facilitated contact with Burns. Mr. Jim Burns furnished information on the CEC lab that Morse assembled. Maggie Beveridge sent notification of Bob's passing and Ruth Morse supplied information about his CEC hiring. Family obituary at https://mclarenfuneral.ca/.

Submitted by John Greenough

Professional Obituary for Neil Church

In the fall of 2022, the Canadian geoscience community lost Dr. Barry Neil Church (February 27, 1934 - November 7, 2022). A lifelong geoscientist and field geologist, Neil mapped and published extensively on both the geology and mineral deposits of British Columbia. He is most well-known for his work on Tertiary/Paleogene/Eocene volcanic caldera complexes in the Okanagan region of southern British Columbia where he established the stratigraphy and applied his extensive geochemical expertise to document the compositional characteristics and petrogenesis of these widespread volcanic rocks.

Dr. Church earned B.Sc. and M.Sc. degrees in Geology at McMaster University in 1959 and 1963, and received his Ph.D. from the University of British Columbia in 1967. His Ph.D. thesis on the "Geology of the White Lake Area" focused on the stratigraphy, structure, and petrology of early Tertiary rocks in the White Lake area near Penticton, British Columbia. This seminal work was followed by a life-long focus on mapping and analyzing volcanic rocks throughout the province.

Neil joined the British Columbia Geological Survey (BCGS) in 1969 and retired in 1999. Over a period of three decades, he spent his summers in the field mapping and collecting data and the winters in Victoria producing over 125 BCGS publications, including numerous geology maps. While with the BCGS, Neil played an important role as economic geologist publishing numerous descriptions of mineral deposits and occurrences and their relationships to the host rocks and regional geology. For example, he published major papers on the Bridge River and Buck Creek mining camps (Church, 1995 and Church and Barakso, 1990). Over the years he made numerous public presentations to geoscientists and prospectors, including frequent presentations at the annual Cordilleran Roundup in Vancouver.

In addition, he was an author or coauthor of over 15 journal articles between 1975 and 2021. Examples of his prominent/influential publications include Church (1975a, 1975b), Church and Johnson (1980), Church et al. (1977, 1979, 1983), Dostal et al. (1996, 2001, 2021) and Monger and Church (1977). Internet search engines show that his advice and knowledge of the geology of British Columbia influenced numerous other refereed publications as his name occurs in the acknowledgements.

One of us (JDG) met Neil in 1977 at the start of the British Columbia uranium exploration boom. He remembers how Dr. Dan Boyle of the Geological Survey of Canada, enthusiastically mined Neil's extensive knowledge of the host volcanic rocks to develop a model for the formation of the uranium mineralization. In a subsequent visit in 1979, JDG was amazed to see how the exploration geologists admiringly rolled out the red carpet for Neil when he visited their properties.

Fig. 1. Church riding "shotgun" during fieldwork, summer 1979

Neil was a loyal supporter of the Geological Association of Canada (GAC). He became a member in 1968 and was awarded the 50-year membership certificate in 2018. As a testament to his love of the profession, he maintained his membership until he was 86 years old. He also belonged to the Pacific Section of the GAC until 2020. However, he was not just a member; he served the GAC as well. The Volcanology and Igneous Petrology Division (VIP) of the GAC was formed in 1975. From 1976 to 1979 he was on the VIP executive as Regional Councilor West, was Vice Chair from 1980 to 1982, and served as Chair from 1982 to 1985. He also made contributions to field trips and guide books associated with annual GAC-MAC conferences (*e.g.,* Church et al., 1977, 1983). Neil was also ahead of his time in advocating for the separate professional registration of geoscientists at a time in British Columbia when they could only be registered as Professional Engineers. After retirement from the BCGS, Neil established Church Geological Services, obtained a Free Miners Certificate for prospecting, and carried out geologic exploration in British Columbia. He kept his mining claims in good standing by completing fieldwork and assessing the results.

In summary, Dr. B. Neil Church made major scholarly and economically relevant contributions to Canadian geoscience through extensive government and journal publications of field work. Over five decades he was an active member of the GAC which included running GAC fieldtrips, contributing to GAC publications, and holding executive positions on the VIP. He will be missed by our geoscience community.

Fig. 2. Neil Church, Fieldwork in the Okanagan, 1979

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Acknowledgements:

K. Dawe (GAC office, MUN, NF) found critical information on Church's GAC, VIP, and Pacific Section membership.

Submitted by J. Greenough, J. Dostal and D. Lefebure

Professional Obituary for Murray Roed

Members of the GAC and Canadian geoscience community will be saddened to hear that Dr. Murray Anderson Roed passed away peacefully on August 6th, 2022 in Kelowna, BC. He leaves a lasting legacy of impact on glacial geology, terrane analysis, public geoscience education, geoscience art and the social side of our discipline.

Murray's ground-breaking Ph.D. (U. Alberta, 1968) mapped the contact between Pleistocene Cordilleran and continental glaciers. In the 1970s (*e.g.* Roed, 1977) and early 1980s his terrain analysis positioned gas/oil pipelines. His surface mapping skills lead to numerous Ontario terrane maps/reports (*e.g.* Roed and/or Hallett 1980) and he contributed to a "how-to" document on terrain analysis published in 1981 (Various authors and Roed, 1981). During the 1990s he worked long hours producing terrain maps for BC forestry companies to meet new legislative regulations designed to prevent slope failures that were taking lives. Few BC geoscientists were qualified to make these maps. His long hours kept forestry working, but he also helped refine regulations for creating terrain maps in mountainous terrain. Around the same time, his analysis of ice movement directions for Diamet and Charles Fipke contributed to the great Canadian mineral exploration discovery, the Ekati diamond mine.

Murray was passionate about promoting geoscience and communicating geoscience to the general public. While at the University of Saskatchewan (B.A. 1959; M.Sc. 1961), along with life-long friend Bill Kaufmann, he helped organize the famous "Ore Gangue" geology club. In 1978 he wrote one of the first local geology books in Canada "A Guide to Geologic Features of Edmonton" (Roed, 1978). In the early 1990s, buried with terrain analysis work, he wrote chapters and got local geoscientists (Kelowna Geology Committee) to write sections of a geology book. He then convinced 35 local firms and the GAC to cover printing costs, and Geology of the Kelowna Area was published (Kelowna Geology Committee, 1995). Two other editions were called Okanagan Geology (Kelowna Geology Committee, 2004, 2014) and Murray was the dominant initiator, organizer and author. He also wrote a book on Cayman geology (Roed, 2006) and another titled Okanagan Geology South (Roed et al., 2011). These books have been used extensively in UBC Okanagan courses and by graduate students. Murray also helped deliver UBC Okanagan sedimentology/stratigraphy and field courses (2000 – 2015). In 2014 he published a landmark journal article on glacial till underlying a one million year old basaltic flow at Kelowna (Roed et al., 2014). The till represents the oldest evidence of glacial activity in southern British Columbia and provides important information on climate during the Pleistocene.

The geoscience community was dear to Murray. He was a member of the Geological Association of Canada for over 50 years, and belonged to the Association of Professional Engineers and Geoscientists of British Columbia (APEGBC now EGBC) from 1967 to his retirement. During his years at the University of Saskatchewan he led in establishing the Maudsley Edmunds Scholarship honoring the original professors in the Geology Department. Over 10,000 copies of his 1995 to 2011 geology books were sold. They generated over $100,000 in proceeds which have been funding scholarships for Okanagan College and UBC Okanagan Earth and environmental science students for two decades. In addition to the books, numerous hiking trails in the Okanagan have geoscience interpretive signs he helped prepare. These efforts led to a plethora of invitations to speak to, or lead field trips for, the public, school teachers, and students at all educational levels. Murray also served the geoscience community with his "geoscape" artistry and examples of his numerous paintings grace the covers and pages of his books (Fig. 2).

The lifetime of volunteer service to the geoscience community and public geoscience education resulted in him receiving the prestigious E.R. Ward Neale Medal from the Geological Association of Canada in 2013. Murray will be sadly missed but his contributions to our profession will live on.

Fig. 1. Murray Roed

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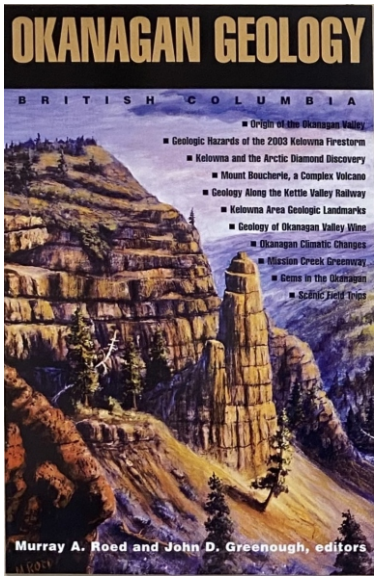

Fig. 2. Photograph of the cover of the 2nd edition of Okanagan Geology (Kelowna Geology Committee, 2014) showing Roed's "Geoscape" painting of Layer Cake Mountain and pinnacle rock in Kelowna, BC, Canada.

University of New Brunswick, Earth Science Department, New England Intercollegiate Geological Conference (NEIGC) Field Trip

Three days of NEIGC field trips were held in south-central New Brunswick. Various people from Canada including the University of New Brunswick, students from the Earth Science department with Professor David Lentz, along with various people from USA (university students and professors, geology professionals) participated in the NEIGC field trips. During these trips, several areas were visited, which we will briefly mention here.

First, the group visited the Benton-Meductic area of west-central New Brunswick. The ancient sequence of volcanic and sedimentary rocks in this area was deposited along the southeastern margin of the Iapetus Ocean and today forms part of the Miramichi Terrane (Fig. 1). The variety of features displayed by rocks in the Benton–Meductic area can be used to reconstruct the geological conditions that existed in this part of the Appalachian Mountain belt. The trip involved looking at roadside outcrops (seven stops), as well as drill cores of the various mineralized occurrences, which include the unique vanadiferous slates of the Woodstock Group, the volcanogenic massive sulfide occurrence of the Meductic Group, and other Cu-Zn-Pb massive sulfides from various parts of the famous Bathurst Mining Camp.

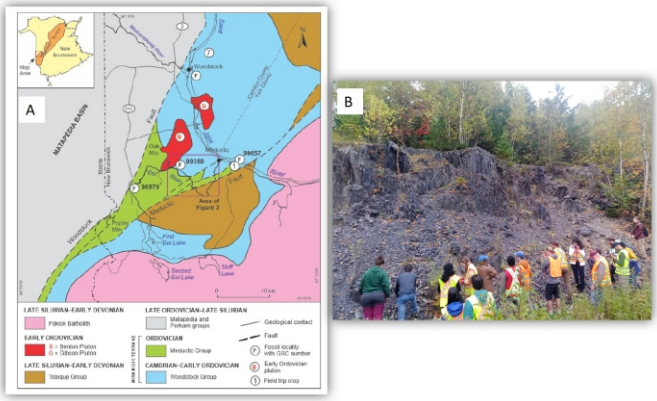

Figure 1: A) Regional geology map of west-central New Brunswick and adjacent Maine. B) Visiting the Benton-Meductic area.

The next area that received lots of attention was the Sharp Mountain diatreme, Woodstock (NB) (Fig. 2). The Early Ordovician Gibson pluton is the main intrusion in the Woodstock area, although several smaller stocks (Churchill, Sharps Mountain, and Grafton) occur in the region as well. Copper mineralization is mainly hosted in porphyritic tonalite at Connell Mountain, but it was reported from the Sharp Mountain tuffisitic diatreme as well.

There are numerous types and styles of granitoid-related mineralization in this part of the Appalachians (Ruitenberg and Fyffe, 1991) associated with Ordovician to Devonian intrusions. Most intrusion-related mineralization, including the Poplar Mountain gold deposit to the west, are Devonian in age, associated with the Acadian orogeny. However, the Lower Ordovician ages of the Gibson intrusions reflect a pre-Acadian intrusive arc suite that rarely exhibits the deformation and metamorphic features (greenschist grade) associated with the main Salinic and Acadian

Figure 2: Photograph of the Sharp Mountain diatreme breccia with host rock and felsite fragments in a tuffisitic groundmass with weak phyllic alteration.

orogenies. The distal turbiditic nature of the sedimentary sequence (Ganderia of the Appalachian Mountains) indicates that the primitive oxidized I-type arc-like magmas intruded into this submergent setting, although possibly intracontinental in nature; the associated Meductic volcanic sequence occurring immediately to the west is a submarine sequence.

Figure 3: Visiting one of the Pokiok Batholith phases called Hawkshaw Granite. The intrusion of a pegmatite-aplitie dyke in this complex.

Figure 4: A) Visiting a part of the Magaguadavic Fault zone; B) A large grain of pyrite with sericite-epidote with slickenfibers in the Pokiok Batholith.

The next area visited was the middle Devonian Pokiok Batholith in south-central New Brunswick. We visited a small pegmatite-aplite dyke (Allandale Granite, 402±1 Ma, U-Pb monazite, Bevier and Whalen, 1990) that intrudes the Hawkshaw Granite (roadside) that is known to be associated with Be-Mo-W mineralization in the region (Fig. 3). The Hawkshaw Granite, with a U-Pb zircon age of 411±1 Ma (Bevier and Barr, 1990; Whalen et al., 1996b), covers an area of about 700 km^2, and underlies much of the eastern part of the Pokiok Plutonic Suite.

We also visited a part of the Magaguadavic Fault zone (highway on ramp) that hosts the Pokiok South Au occurrence (Fig. 4) as well as examined drill cores from ~ 15 years ago, which were brought by Dr. Kathleen Thorne from Geological Surveys Branch, Department of Natural Resources and Energy Development, Fredericton, New Brunswick.

The next area that was very interesting for visitors was the Lake George Antimony Mine, Central New Brunswick. The Lake George antimony mine is located approximately 30 km west of Fredericton in west-central New Brunswick (Fig. 5, Lentz et al., 2020), and was once North America's largest producer of antimony (stibnite, Sb_2S_3) until it closed in 1998, due to low Sb prices.

In the Fredericton area, Silurian rocks of the Kingsclear Group form an approximately 80 km wide belt known as the Fredericton Trough, which lies between the Miramichi Highlands to the northwest and the St. Croix Highlands to the southeast. The most recent interpretations suggest that the Fredericton trough was either an arc-trench gap or a fore-deep basin in what remained of the Iapetus Ocean (Lentz et al., 2020). Erosion of the Miramichi Highlands occurred into this basin, while the arc was accreted onto the North American continental margin and subsequently uplifted.

The Early Silurian Kingsclear Group comprises the Hayes Brook, Cross Creek, Burtts Corner, and Taxis River formations to the northwest of the Fredericton Fault and the Digdeguash, Sand Brook, and Flume Ridge formations to the southeast of the Fredericton Fault. Within the Kingsclear Group, detritus was identified that originated from the adjacent Ordovician units. The contacts between the Kingsclear Group and the Cambro-Ordovician rocks they overlie are often faulted, however the contacts in some areas are unconformable depending on their location within the Fredericton Trough. A large portion of the eastern part of the Fredericton Trough is overlain unconformably by Carboniferous age sedimentary rocks (Lentz et al., 2020).

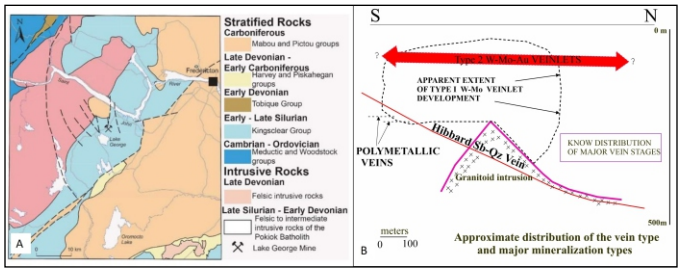

Figure 5: A) Geological map of the Lake George area and surrounding region in central New Brunswick; B) Cross section through the Lake George Antimony deposit illustrating the earlier stage W-Mo-Au stockwork veins and the large Hibbard gold-bearing Sb-quartz vein and the Lake George granodiorite cupola that is related to the Hawkshaw Granite of the Pokiok Batholith to the north (modified from Seal et al., 1988).

Acknowledgement

We appreciate Prof. Chunzeng Wang from University of Maine at Presque Isle for managing and hosting the NEIGC. Also, we thank Dr. James Walker, Dr. Kathleen Thorne, Dr. Ayalew Gebru, and Steven Rossiter from Geological Survey Branch, New Brunswick Department of Natural Resources and Energy Development (Bathurst and Fredericton Branch) for their support in showing the areas as well as the drill cores to the visitors of this trip.

We also thank Bryan Way (Canadian Manganese Company) for accompanying us on the first day of the field and showing some units related to iron and manganese deposits in west-southern New Brunswick.

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Submitted by Fazilat Yousefi & David Lentz.

Figure 6: Group of geologists looking at the Middle Ordovician Sharp Mountain diatreme breccia, Woodstock, New Brunsvick.

VIP sessions in 2023

AGS

The 49th Atlantic Geoscience Colloquium was held in early February 2023 and included one VIP special session and several VIP-related presentations and posters. The abstracts are published in the journal Atlantic Geoscience and are available free to download (https://journals.lib.unb.ca/index.php/ag/article/view/33390/).

The Special Session entitled "New developments in the study of igneous systems and associated critical mineral deposits in the northern Appalachians" was organized by Fazilat Yousefi (UNB) and Donnelly Archibald (SFX) and included 11 talks and 3 posters. The keynote speaker of this session was Dr. Zsuzsanna Magyarosi from the Geological Survey of Newfoundland and Labrador (GSNL). The talk was titled "Rare-earth-element mineralization associated with the peralkaline Fox Harbour Volcanic Belt". Professor David Lentz (UNB) talked about "Analysis of pre-, syn-, and post-mineralization porphyry to pegmatitic dykes associated with various types of mineralization: dissecting source, fractionation, emplacement, and timing of complex magmatic hydrothermal systems", which was much appreciated by the attendees.

Several students from the University of New Brunswick (UNB) gave lectures on New Brunswick igneous rocks. The presentation of Fazilat Yousefi (PhD student, UNB) was about highly oxidized, calc-alkaline to alkaline Silurian-Devonian mafic to felsic plutonic and volcanic rocks scattered throughout New Brunswick (NB), which show adakitic features. These Devonian adakitic rocks are fertile with high Sr/Y and La/Yb. The title of the talk was "Zircon compositional systematics from Devonian oxidized I-type granitoids: examination of porphyry Cu fertility indices in the New Brunswick Appalachians". Zircon compositions are commonly used as an indicator for porphyry Cu ± Mo ± Au systems.

Submitted by Fazilat Yousefi.

GAC-MAC 2023

A VIP-sponsored Special Session (SS26) titled "Rare Metals in Igneous Systems" was conducted during the hybrid "GAC-MAC-SGA Annual Meeting 2023" in Sudbury, ON, on May 27th, 2023. The session was co-chaired by Zsuzsanna Magyarosi (GSNL), Nadia Mohammadi (GSC), Zeinab Azadbakht (OGS), Tarryn Cawood (GSC), and Anne-Aurélie Sappin (GSC). The session primarily centered on critical rare metals, encompassing REEs, Y, Nb, Li, Cs, and Ta, all of which have a pivotal role in Canada's shift towards a low-carbon economy.

It highlighted recent research on ore deposits associated with these critical minerals, emphasizing their origin, geochemistry, geochronology, and metallurgy within diverse igneous systems. A total of 15 presentations were featured during the session, comprising 11 talks and four posters. The session spanned from 8:00 am to 4:00 pm.

The session commenced with a keynote presentation by Anthony Williams-Jones (McGill University) titled "Carbonatites, superconductivity, and niobium." Following this, two talks were presented by Olga Vasyukova (McGill University) and Tiera Naber (The University of British Columbia). The second part of the morning session also began with a keynote presentation, delivered by Bob Linnen (Western University) on "The Lithium Cycle and Constraints on the Generation of Lithium Pegmatites." This was followed by talks from Yiting Zhu (UNB) and Graham Halcrow (UNB). In the afternoon, the session opened with a keynote talk by Dave Lentz (UNB) on "Building Robust Models for Extreme Fractionation in Rare-Metal Granites and Pegmatites: a case for estimating bulk D using the Rayleigh fractionation-distillation law from low-T magma series." The afternoon session continued with four talks presented by Abdulgafar Amuda (Bayero University Kano and University of Science and Technology of China), Basma Feteha Salem (UNB), Zsuzsanna Magyarosi (GSNL), and Robert Hazen (Carnegie Institution for Science).

The session was succeeded by a 40-minute "Panel Discussion" featuring Prof. Anthony Williams-Jones (McGill University), Prof. Bob Linnen (Western University), Prof. Dave Lentz (UNB), and Prof. Robert Hazen (Carnegie Institution for Science).

During the panel discussion, the following questions were addressed:

1. How important is the nature of the mantle and/or crustal sources? Is the pre-enrichment in rare metals of these sources an essential factor to form economic deposit?
2. What is the impact of hydrothermal processes on the formation of rare metal deposits? Concentration or dispersion? If hydrothermal processes introduce more REE minerals in a deposit, wouldn't that make it more difficult for processing?
3. Fractional crystallization is thought to be essential to achieve Li saturation in a granitic melt. Do you think this could occur within a pegmatite vein or dyke, or could it only occur within a large body of granitic melt?

Submitted by Nadia Mohammadi.

The VIP-sponsored Special Session (SS18) titled "Iron-rich Au, Ag, Bi, Co, Cu, F, Mo, Nb, P, Pb, REE, U, Zn, PGE Mineralization: Genetic Processes and Feedback Mechanisms between Magmatism and Metasomatism" was organized by Wyatt Bain (Lakehead University), Louise Corriveau (GSC) and Jean-Francois Montreuil (MacDonald Mines Exploration Ltd.). The focus of the session was the metasomatic and magmatic processes leading to Fe and critical metal enrichment in IOCG, IOA, metasomatic iron, nelsonite, carbonatite, and magnetite-rich cumulate, and other iron-rich deposits types within the broader context of their host mineral systems.

Li-REE workshop

During the Central Canada Mineral Exploration Convention in Winnipeg (November 6-7, 2023), Tania Martins organized a one day technical workshop dedicated to lithium and rare-earth elements. The focus was on petrogenesis to exploration of critical mineral systems: Li-Cs-Ta and Nb-Y-F-U-Th-REE pegmatites, and alkali- and carbonate-rich rocks. The presenters were Lee Groat (The University of British Columbia); Tania Martins, Marc Rinne and Tyler Hodder (Manitoba Geological Survey); David Lentz (University of New Brunswick) and Anton Chakhmouradian (University of Manitoba).

Presentations from leading experts on Li-Cs-Ta pegmatites, Nb-Y-F-U-Th-REE pegmatites, and alkali- and carbonate-rich rocks where complemented by a hands-on component with mineral and rock identification facilitated by Lynde Guillaume (Axiom Group), Anton Chakhmouradian and Ekaterina Reguir (University of Manitoba).

Submitted by Tania Martins

Upcoming VIP activities

AGS

The **50th Atlantic Geoscience Colloquium** will be held at the Crowne Plaza, Moncton, New Brunswick on 2-3 February 2024 (https://atlanticgeosciencesociety.ca/colloquium-2024).

A Special Session titled "From Ocean Crust to Mountain Peaks: A Celebration of the Career of Sandra Barr" is organized by Deanne van Rooyen and Christ White from Acadia University to celebrate the long and varied career of Dr. Sandra Barr. "From her early work in seafloor rocks to her life-long interest in the Appalachians Sandra has been at the forefront of the advances in geological research for decades. Her work is recognized worldwide, and she has been a mentor and guide to countless students and professionals. We invite contributions dealing with any of the fields of research to which Sandra has made contributions to celebrate the career of one of the preeminent geologists in Canada."

A VIP-related Special Session titled "Igneous-hydrothermal systems and critical metals in the northeast" is organized by Michael Powell and Pēteris Rozenbaks from Department of Earth and Environmental Sciences, Dalhousie University. "The global race to build greener economies, coupled with recent federal and provincial government initiatives, have spurred a growing demand for critical metals. Enhancing our understanding of the formation of critical metal resources during igneous and hydrothermal ore system evolution is key to maximizing our discovery and extraction of such resources.

This session aims to gather the latest studies of critical metals related to magmatic and hydrothermal systems within eastern Canada and the northeast USA. Contributions are welcome from all domains of igneous petrology, hydrothermal environments, and economic geology."

Prof. Sandra Barr

Northeastern Section Meeting of the Geological Society of America (NE GSA)

The NE GSA will be held in New Hampshire, USA, on 17-19 March, 2024 (https://www.geosociety.org/GSA/Events/Section_Meetings).

A Symposia titled "Neoproterozoic and Paleozoic Geological Connections Among Northwest Africa, Europe, and Eastern North America I – A Session Honoring the Career of Sandra M. Barr", endorsed by GSA Structural Geology and Tectonics Division; GSA Mineralogy, Geochemistry, Petrology, and Volcanology Division, is organized by Yvette Kuiper, Margaret Thompson, Chris E. White, Belkacim Saïd, Faouziya Haissen, and Pilar Montero. The symposia is a celebration of the career of Sandra M. Barr. It will be focused on geological comparisons and potential correlations among Neoproterozoic (or older) and Paleozoic rocks in northwest Africa, Europe, and eastern North America or on the Alleghanian/Variscan/Hercynian Orogeny.

GAC-MAC-PEG 2024

Tania Martins is leading the organization of the 10th International Symposium on granitic pegmatites (PEG2024) taking place in May 2024. She is joined by Lee Groat (The University of British Columbia, Canada), Encarnacion Roda-Robles (The University of the Basque Country, Spain) and Alexandre Lima (Porto University, Portugal).

PEG2024 features 3 days of technical talks and a 4-day field trip dedicated to the fascinating study of pegmatites. PEG2024 is teaming up with the GAC-MAC annual conference in Brandon, Manitoba. Hope to see you all there!

PEG 2024

Brandon, Manitoba, Canada
May 19-22, 2024
10th International Symposium on Granitic Pegmatites

Submitted by Tania Martins.

12th International Kimberlite Conference

The 12th International Kimberlite Conference will be held in Yellowknife, Northwest Territories on 8-12 July, 2024 (https://12ikc.ca/). The Organising Committee extends a warm invitation to all participants of previous kimberlite conferences and potential first time delegates. "The conference will bring together geoscientists from both the academic and exploration/mining communities to share their knowledge, stimulate scientific debate and to further our understanding of the geology of kimberlites, diamonds and related subjects. The conference technical programme will include the usual oral and poster sessions, and for the first time will feature seminars. 12 IKC will also offer a selection of field trips showcasing the Northwest Territories diamond mines." Scientific themes will include 1) Diamonds; 2) Emplacement and Economic Geology of Kimberlites and Related Magmas; 3) The Origin and Evolution of Kimberlites and Related Magmas; 4) Diamond Deposits – Exploration and Mining; and 5) Cratonic Mantle – Petrology, Geochemistry and Geophysics.

Submitted by Pierre-Simon Ross.