

GEOLOG

The Newsmagazine of the Geological Association of Canada / Le Bulletin de l'Association géologique du Canada

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AGS 2011 Colloquium

The 37th Colloquium and Annual General Meeting of the Atlantic Geoscience Society (AGS) was held at the Fredericton Inn, Fredericton, New Brunswick on February 11-12th, 2011. Fredericton is also home to the University of New Brunswick (UNB) Department of Earth Sciences and the NB Department of Natural Resources (DNR) Geological Survey, whose faculty and staff supported the AGS meetings, technical sessions, workshops, and the other AGS events. A total of 196 registrants attended this year's gathering.

The program commenced on Friday morning with a workshop on the 'Applications of Laser Ablation to Problems in Mineral Exploration and Ore Petrogenesis' held at the Quartermain Center at UNB's Earth Science department. The workshop covered Inductively Coupled Plasma Mass Spectrometry (ICP-MS) theoretical fundamentals, including laser-target interactions, U-Pb geochronology, trace-element analysis of oxides and sulfides, analysis and interpretation of fluid and melt inclusions, and element mapping and time-resolved data reduction using Lolite software. Real-time demonstrations were done using UNB's new LA-ICP-MS, and attendees were able to tour the facilities, including the scanning electron microscopy (SEM) lab to gain insight into the capabilities and applications of this new technology. Special thanks are extended to organizer Dr. Chris McFarlane (UNB) with contributions from Dr. Jacob Hanley (St. Mary's University), Dr. Paul Sylvester (Memorial University of Newfoundland) and Dr. Paul Bedard (University of Quebec at Chicoutimi).

Those who did not attend the LA-ICP-MS workshop on Friday had the opportunity to partake in several different tours. Twenty one participants travelled to Sussex, NB for a tour of the Potash Corporation of Saskatchewan (PCS) mine and mill. Others toured *(AGS Colloquium continued page 4)*



Jim Franklin giving his keynote address during the 2011 AGS Colloquium Awards Banquet.

Inside This Issue:

Passages	6
Sec.-Treas. Report	10
CGF submission call	15

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The **MISSION** of the Geological Association of Canada is to facilitate the scientific well-being and professional development of its members, the learned discussion of geoscience in Canada, and the advancement, dissemination and wise use of geoscience in public, professional and academic life.

The **VISION** of the GAC® is to be a multidisciplinary scientific society supportive of the entire scope of the geosciences in Canada. The GAC® aims to be a geoscience community that is knowledgeable, professionally competent and respected, whose input and advice is relevant, widely sought and utilized, and whose vital contribution to the economic prosperity and social well-being of the nation is widely acknowledged.

La **MISSION** de l'Association géologique du Canada est d'aider au développement scientifique et professionnel de ses membres, de favoriser les échanges géoscientifiques au Canada ainsi que de promouvoir et de diffuser l'utilisation éclairée des géosciences dans un contexte public, professionnel et académique.

La **VISION** de l'AGC® est de faire connaître une communauté géoscientifique de grand savoir, dont les compétences professionnelles sont respectées, dont les suggestions et les avis sont pertinents, recherchés et utiles, et dont la contribution largement reconnue est considérée comme vitale pour la prospérité économique et le bien-être de la nation.

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GEOLOG is published for the benefit of GAC[®] members and its content reflects the diversity of the organization. News items and short articles on topics of potential interest to the membership including public geoscience awareness are encouraged. Also encouraged are communications promoting interaction among academic, industry and government sectors. GEOLOG accepts and publishes contributions in both of Canada's official languages. Opinions expressed herein are those of the writers and do not necessarily represent the official positions of the GAC[®]. GEOLOG is one of several forums provided by the GAC[®] for scientists worldwide.

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Contents / Table des matières

Features / Articles

AGS Colloquium	1
Passages: Denis Ian Gough	6
Passages: Gordon Gross	7
Secretary-Treasurer's Report	10
CGF call for proposals	15
GAC-MAC 2012	16



Spotted on a Dodge truck in downtown Whitehorse: GAC with just a touch of evil.

This GEOLOG benefits from the contributions and assistance of / Nous voulons souligner la contribution et l'assistance de: Michelle McKeough, Karen Johnston, Eleanor Penney, Robert Baragar, Dave Lentz, Ted Evans, Lori Cooke, Toby Rivers, Olga Ijewliw, and Carolyn Relf. Apologies to any I have missed. Your contributions for future editions are welcome / Désolé pour ceux qui auraient été involontairement oubliés. Nous sollicitons vos contributions pour les publications à venir.

- KD

(AGS Colloquium, continued from page 1)

UNB's EM facilities (highlighting the microprobe, SEM, FE-SEM, TEM, microCT, & Raman, XRD systems) or the Research and Productivity Council (RPC) of New Brunswick Mineral Process Development and Testing in Fredericton. Many thanks to Brian Roulston (PCS); Drs. Doug Hall, Suporn Boonsue, and Ven Reddy (UNB); and Ross Gilders and Leo Chung (RPC) for welcoming registrants to visit their facilities.

Following the workshop and tours, the AGS meetings, poster sessions, and technical sessions commenced at the Fredericton Inn. A total of 34 poster, and 64 oral, presenters were in attendance at this year's AGS Colloquium. The Friday evening special-session themes ranged from 'Groundwater Vulnerability in Atlantic Canada' to 'New Developments in the Appalachian Orogen'. The evening's poster session was a great opportunity, to network and gain feedback and insight, and especially for students from the Atlantic universities to enhance their professional development skills as they build a career in geoscience. The technical sessions continued on Saturday, with new themes that included: 'Surficial Materials and the Environment', 'Ordovician and Siluro-Devonian Metallogeny in the Appalachian Orogen', 'Resources of the Carboniferous Basins', and 'New Developments in Atlantic Geoscience'. Many thanks are extended to all the presenters, to those who served as session chairs and kept the program on schedule, and to the UNB students who volunteered as audio-visual technical assistants.

Saturday evening marked the first Inaugural Earth-Ring Ceremony that was sponsored this year by the Association of Professional Engineers and Geoscientists of New



Jim Walker presenting the Rupert H. MacNeil award to Jessica Wilson.

Brunswick (APEGNB). Receiving an Earth-Ring is not conditional on being registered with the professional association; simply that the person is part of a profession dedicated to seeking the truth in Earth Science and applying this to the service of mankind. Thirty two people participated in this newly adopted tradition for New Brunswick engineers and geoscientists.

The Awards Banquet and Social followed the Ring Ceremony at the Fredericton Inn. Master of Ceremonies for the Banquet was incoming AGS president for 2011-2012, Jim Walker of NBDNR. This year's recipient of the Gesner Medal (**Distinguished Scientist Award**) was Dan Kontak of Laurentian University for his valuable contributions to geology in the Atlantic Region. Student participation is considered a very important part of the AGS Colloquium, and the following awards were given to the best presenters:

Sandra Barr Award (Best Graduate Oral Presentation): Ravinder Pannu (University of Saskatchewan and Acadia University) – A laboratory method for the quantification of mercury and GHG volatilization from soils.

Rupert H. MacNeil Award (Best Undergraduate Oral Presentation): Jessica Wilson (Dalhousie University) – Geochemistry of the igneous rocks associated with the MMH porphyry copper deposit, Chuquicamata District, Chile.

Graham Williams Award (Best Student Poster Presentations): Jacob Hansen (University of Maine at Farmington) – Imbricated Seboomook Group, Bald Mountain, west-central Maine: Tectonic, slump, or mixed origin?; Annina Margreth (Dalhousie University) -Testing



Suporn Boonsue and Jacob Hanley explain the differences between good and bad laser craters.

the concept of altitudinal weathering zones on Cumberland Peninsula, Baffin Island, using terrestrial cosmogenic nuclide (TCN) exposure dating

The highlight of the evening was the invited guest speaker, Dr. Jim Franklin, Ph.D., FRSC, P.Geo, with the keynote address entitled "Future Mineral Resources Discoveries: New Knowledge Needed for Discovery". He demonstrated how the scientific method has been used to create a better understanding of the earth's processes, using examples from his own research in VMS deposits. He inspired the attendees to think about what fundamental geological questions remain to be unanswered, and how his improvements in technology continue to make advancements possible. Dr. Franklin also had earlier spoken at a NB Canadian Institute of Mining, Metallurgy, and Petroleum (CIM) sponsored lecture at the UNB Department of Earth Sciences Quartermain Center on Friday afternoon. The lecture was titled 'Hot Water, Hot Minerals and Hot Life Forms on the Ocean Floor? What "Black Smokers" tell us about Earth Systems', and allowed Dr. Franklin to focus on his own work on mineralizing processes at seafloor hydrothermal sites. From this research, precise guidelines for finding new resources in the ancient seafloor sequences found throughout the world have been developed.

Following the conclusion of the formal program, registrants were able to socialize around the cash bar while being entertained by various musically talented geoscientists partaking in the jam session that has become an annual tradition.

The success of this year's Colloquium can be attributed to the efforts of numerous individuals. AGS Colloquium General Chairman Dr. David Keighley (UNB) coordinated the colloquium logistics and Technical Chairman Dr. David Lentz (UNB) organized the comprehensive technical program. Dr. Chris McFarlane (UNB) assembled the pre-meeting workshop and also developed and maintained the conference website. Michael Parkhill (NB DNR) and

Susan Johnson (NB DNR) compiled the abstract volume and Kay Thorne (NB DNR), with the assistance of Joe MacIntosh (NB DNR), handled the registration duties. Assistance was also provided by Elisabeth Kusters, Grant Ferguson, Rob Raeside, Brian Roulston, Cliff Shaw, Bruce Broster, Sherry McCoy, Susan Brodie, and several student volunteers from UNB's Department of Geology.

Finally, this conference would not have been financially possible if not for the largesse of our corporate sponsors, including the APEGNB, NB DNR (Geological Surveys Branch), PotashCorp, SWN Resources Canada, Geodex Minerals, Resonetics, Natural Resources Canada, Apache Canada, Agilent Technologies, Cache Exploration, CIM, and Corridor Resources.

The AGS Colloquium will return next year to Moncton in early February.

By **Michelle McKeough**, University of New Brunswick



Jim Walker presenting the Gesner Medal Distinguished Scientist Award to Dan Kontak.

Information for Contributors/Directives aux Auteurs

Submissions are preferred as digital files sent as e-mail attachments to kfmdawe@mun.ca or on a disc via the post to the Editor. Discs will be returned if sent with self-addressed mailer. Documents should be sent as unformatted text (*.doc, *.txt or *.rtf) files. Graphics should be as CorelDraw (*.cdr) or Acrobat (*.pdf) file types, and images should be at 300 dpi, RGB colour without internal compression (preferably *.tif). Files greater than 2MB should be compressed or zipped before sending via e-mail. Additional information on other file formats can be obtained from the Editor. Hard copy text, graphics and photo images are also welcome. **All contributions may be edited for clarity or brevity.**

Remaining Submission Deadlines for 2011:

October/Octobre 10 and/et November/Novembre 26.

Nous préférons que les articles nous soient soumis sous forme de fichiers numériques, annexés à un courriel, ou sur disquette, par courrier conventionnel adressé au Rédacteur en Chef. Les disquettes seront retournées si elles sont accompagnées d'une enveloppe affranchie avec adresse de retour. Les documents doivent nous parvenir en version texte non formaté (*.doc, *.txt ou *.rtf). Les graphiques doivent avoir un format CorelDraw (*.cdr) ou Acrobat (*.pdf), et les images doivent avoir une résolution de 300 dpi dans un format non comprimé (préférentiellement *.tif). Les fichiers de dimensions supérieures à 2 Mo doivent être comprimés avant envoi par courriel. Veuillez communiquer avec le Rédacteur en chef en ce qui concerne la possibilité d'utiliser d'autres formats. Nous acceptons aussi une copie imprimée sur papier du texte, graphiques et images. **Le Rédacteur en chef se réserve le droit de modifier l'article à des fins de clarification ou de brièveté.**

Denis Ian Gough (1922-2011)

Ian Gough was born on 20 June 1922 at Port Elizabeth, South Africa. He received a B.Sc and M.Sc. from Rhodes University (in 1943 and 1947, respectively), and a Ph.D. from the University of Witwatersrand in 1953. From 1947 to 1958 he worked as a researcher at the South African Council for Scientific and Industrial Research, before moving to academe where he spent the rest of his career. In the years 1958-63 he was at the University College of Rhodesia and Nyasaland (in what is now Harare, Zimbabwe), followed by a short period (1964-66) at the Southwest Center for Advanced Studies in Dallas, Texas. Thereafter, he moved to the University of Alberta in Edmonton, Canada where he remained on the faculty until his retirement in 1988.

Ian had a rich and productive research career in his chosen field of geophysics. He published more than 100 papers in first-class international scientific journals, and made seminal contributions to a very wide range of topics in the earth sciences. He belonged to a generation of scientists who approached scientific work very much from first principles.

Given a need to bring observations to bear on a particular problem, he set about designing, constructing, and operating the necessary apparatus. I well remember him preparing the unique Gough-Reitzel magnetometers for an upcoming field season—rows of vertical metal tubes standing to attention like a squadron of soldiers on parade. And each one containing a sensitive magnet system and an ingenious home-made camera.

He was simultaneously commanding officer, quartermaster, and chief mechanic. One thinks of Newton polishing mirrors for his own telescope, or of Faraday co-opting a giant link from an anchor chain to construct his electromagnet. Deployed as arrays across wide stretches of North America, South Africa, and Australia, Ian's magnetometers revealed hitherto unknown structures in the earth's crust, such as an ancient plate-tectonic boundary stretching more than 1000 km through the Canadian Shield and down into Wyoming.

Another example of this hands-on way of doing science was the Gough spinner magnetometer, built in the days when nothing was available off-the-shelf, but at a time when the ability to measure the weak "fossil" magnetism in rock samples was crucial to establishing the reality of the way in which the Earth's magnetic poles, and the continents themselves, have drifted about over huge distances; the sort

of data which would ultimately underpin the modern theory of plate tectonics. These examples are but two from a long list that includes the accurate determination of the amount of thermal energy flowing out of the Earth, the seismic activity induced by the filling of large reservoirs, and the speculation that the supercontinent Gondwanaland was cracked apart by the weight of an ice cap hundreds of millions of years ago. And this is by no means an exhaustive list.

Dedicated as he was to his own research, Ian was also committed to playing a leadership role in the scientific community at large. He served as President of the International Association of Geomagnetism and Aeronomy, President of the Canadian Geophysical Union, and as Director of the Institute of Earth and Planetary Physics (now the Institute for Geophysical Research) at the University of Alberta. He was also instrumental in setting up Canada's highly-acclaimed national geosciences program Lithoprobe.

"Ian's magnetometers revealed hitherto unknown structures in the earth's crust, such as an ancient plate-tectonic boundary stretching more than 1000 km through the Canadian Shield and down into Wyoming."

Ian Gough's contributions to geoscience were recognized nationally and internationally. He was awarded the Canadian Geophysical Union's J. Tuzo Wilson Medal (1983), the Royal Astronomical Society's Chapman Medal (1988), and the South African Geophysical Association's Rudolf Krahnemann Medal (1989). He was also a Fellow of the Royal Society of Canada, the American Geophysical Union, and the Geological Association of Canada.

During his last field work in South Africa Ian discovered a taste for writing poetry and after his retirement turned to that. He remarked more than once that doing this was more difficult than geophysical research! Nevertheless, in 2006 he published *Signing the Light*, a book of poetry that reveals a sensitive and caring nature.

Ian was always a thoughtful and courteous colleague, mentor, and friend. He inspired and unfailingly supported generations of students, post-doctoral fellows, and younger faculty members. His passing is a great loss to us all, but his example of a life well lived, of commitment and service, is a legacy of which we are all the beneficiaries.

By **Ted Evans**, Edmonton March 2011

Gordon Arnold Gross (1923-2011)

With the death of Gordon Gross on March 14, 2011 Canada lost one of her pre-eminent earth scientists and his colleagues, a valued mentor and friend. Gordon devoted most of his professional life - more than 50 years - to the study of iron in all aspects of its natural setting and left us a rich legacy of his findings in a body of work comprising more than one hundred titles. But beyond his written work, through personal contacts (consulting, lecturing, and meetings), scientists in many parts of the world benefited directly from his knowledge. As a Research Scientist with the Geological Survey of Canada, Gordon had the opportunity to collect data systematically from all regions of Canada unbounded by dictates, other than the science itself, and the logical evolution of his work reflects this. He was fortunate to begin his project at a time when exploitation of iron in Canada was in its initial phase and knowledge and understanding of iron occurrences at a fairly elementary level. Accordingly, his work provided an on-going and expanding base of knowledge to the industry and to the science of iron in the natural environment; the latter a subject of increasing current interest in its possible revelations of environments past. His last great contribution was a summation and analysis of his life's work - replete with the data of 50 years of collecting - in a monumental paper issued scarcely 2 years before his death (Gross, 2009). How like Gordon to have felt so keenly his responsibility to his employer - the people of Canada - as to have wrapped up all his work in a package so readily accessible to his successors.

Gordon Gross was born near Goderich, Ontario, October 11, 1923 where he received his early education. Just prior to the war, the family moved to Golden Lake, Renfrew County in the Ottawa Valley of eastern Ontario and here Gordon completed his high school by means of a daily 10-mile commute by bicycle to nearby Eganville. Following graduation he worked in a munitions factory in Hamilton for two years. Then, in 1942, he enlisted in the RCAF and as an air gunner in England completed a tour of operations with 433 Squadron, 6th Bomber Command and subsequently, undertook instructing duties until returning to Canada at war's end. Like so many other veterans he took advantage of the Government's programs for war veterans to embark on a university education. From Queen's University in Kingston, Ontario he earned



BA (1950) and MA (1951) degrees in geology, then, following a period of mine and exploration work in Sudbury, completed a PhD program at University of Wisconsin.

The hiatus in his education in 1951 was initiated by a most fortunate event; his marriage to a fellow Queen's student, Elizabeth (Betty) Stewart, who like Gordon, was from the Ottawa Valley (Winchester). Nothing could have contributed so fully to Gordon's happiness and career as the life-long support and companionship that resulted from his marriage to Betty. Two children (boy and girl) came into their lives and subsequently grandchildren and ultimately a great grandchild followed. One might,

perhaps, conclude that education is best pursued on a schedule that can accommodate such a marvellous diversion.

Gordon's interest in iron developed at an early stage of his professional career. In the summer months of 1949 and 1950 he worked with the Iron Ore Company of Canada in the developing iron ore region of Quebec-Labrador and utilized material collected there for his Master's thesis at Queen's. His subject was the Ruth Shales, believed to have been harbingers to overlying Sokoman Iron Formation, the principal ore-bearing iron formation in Canada. Prophetically, the thesis itself proved to be a harbinger to Gordon's own career development in the study of iron.

Following graduation from Wisconsin, Gordon spent three semesters as an Assistant Professor at University of Cincinnati, Ohio, then in 1956 joined the Geological Survey of Canada in Ottawa. Almost immediately he was assigned a new project "The Geology of Iron and Manganese Deposits in Canada". This was a project with enormous potential as very little systematic work had been done at this stage on iron in Canada and Gordon was uniquely suited by background and temperament to undertake it. He could not have realized at that time that this project would be his life work.

Within the next decade much of Gordon's work would be focussed on visiting, observing, assessing, recording and interpreting iron formation occurrences throughout much of Canada but most particularly in the eastern Canadian Shield and Maritimes. Although much was inventory work,

the varied occurrences that were presented to him by these studies, provided a basis for developing methods of classifying, analysing, and formulating theories of genesis of iron formations and the conditions for ore formation within them. The resulting science was mostly laid out in the first of three massive volumes that Gordon published in the Geological Survey's Economic Geology Series in 1965, 1967 and 1968. The latter two volumes focussed on iron deposits of the Appalachians and Grenville Province - ie the St. Lawrence and Maritime regions - and the Labrador Geosyncline respectively. The Labrador Geosyncline or Trough, as it is commonly called, is an elongate belt of sedimentary and volcanic rocks of Mid-Proterozoic age that extends southward from Ungava Bay to within a few hundred kms of the St. Lawrence river. It contains iron formation over much of its extent and is our greatest source and potential source of commercial iron ore. It represented Gordon's initiation into iron studies and remained an enduring attraction for him throughout his career. These three volumes continue to be the bibles of iron exploration and studies in Canada and abroad.

Following the summation stage represented by the publishing of these works, the focus of the project tended to broaden its base to cover the rest of Canada - the Arctic, and Western, and Central Canada - and beyond our borders to include studies of iron and related deposits elsewhere in the world, notably, for extended periods, Ukraine and China, and after 1983 increasingly the seabed. All such studies returned us dividends in terms of the better understanding they gave of our own deposits. The nature of the studies also tended to shift in later years, from analyses of physical form and setting to analyses of compositional shifts from site to site and its significance in terms of origin and tectonic setting. The concept of iron formation itself broadened to include strataform massive sulphide deposits and such other strataform deposits as could be attributed in part or whole to a hydrothermal origin, all encompassed by Gordon's inclusive term, stratafer deposits. Thus, was born the concept of stratafer horizons, marking periods of intense submarine volcanic and hydrothermal activity which, in their entirety, could be targets for mineral exploration. Some of his latest work involving the role of bacterial action in the fixation of iron in iron formation, nicely rounded out a career of study that progressed from basic mapping of iron occurrences in Canada to the highly sophisticated study of the many aspects of their genesis. A life time well spent!

In the course of all these latter studies the project was interrupted for two years, 1972 - 1974, while Gordon undertook to manage the Commonwealth Geological Liaison Office in London. In this position he travelled widely throughout the Commonwealth, especially the GEOLOG

underdeveloped parts of it, consulting and advising on mostly economic geology concerns. For this period he must have suspended, at least partly, his core interest in iron and drew much more on his earlier experience as an economic geology generalist.

Gordon was at base an economic geologist so it is not surprising that at all stages of his scientific studies he had an eye on the economic potential of the iron formation under study and took care to keep industry informed of his work through the mining journals and mining conferences.

Gordon's value to society received recognition at many points in his career: the earliest from Queen's with a medal for top geology student in his graduating year; later a Public Service Award of merit from the Public Service of Canada, the Leonard Medal from the Engineering Institute of Canada, the CIM Proficiency medal, and the Queen's Golden Jubilee Medal. But, in addition, the numerous invitations he received from scientific organizations around the world to speak or consult and from the UN for participation on their committees and missions was, itself, a very cogent form of recognition of his achievements. Notable among the latter was his participation in an expert panel on "United Nations World Survey of Iron Ore Resources" in 1966 -67 and in his assignments as UN advisor on iron ore resources to the governments of British Guiana (1962 - 3 months), Ceylon (Sri Lanka) (1964 - 3 months), and Congo (1968 - 6 weeks).

After Gordon retired in 1989 he continued to work on the iron project and in the intervening 21 years, 18 as an emeritus scientist, published a number of significant, additional papers and ended with the comprehensive analysis and overview of the project that was noted earlier. This was issued by the Survey as an open file disk in 2009, just two years ago.

Gordon's professional life was very much underlain and supported by a rich family life that included a cottage on Pike Lake, near Perth, Ontario designed by Gordon himself and appropriately named "Ironwood". The "cottage" (actually a two storey structure more like a family home) was a centre around which a great deal of the Gross's family and social life coalesced and a place where friends were so often welcomed. That it was located in the heart of the Canadian Shield did nothing but enhance its value, in Gordon's mind at least. The church was also an important element in Gordon's life as befits one from a clergy family and his faith a force that undoubtedly shaped much of his life. Gordon's was truly a life of service and continuing contribution to society and his departure removes a momentum that will be sorely missed.

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By **Robert Baragar**, Ottawa ON July 2011

Howard Street Robinson Fund

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

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

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

For further information and proposal submissions, please contact:

Benoit Dube, Chairman, Robinson Fund
c/o Geological Survey of Canada
490 rue de la Couronne
Québec (Québec) G1K 9A9
418 654-2669
bdube@nrcan.gc.ca

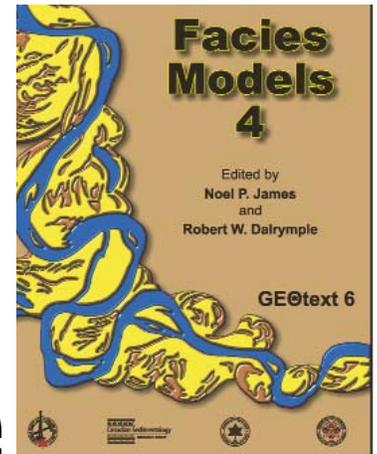
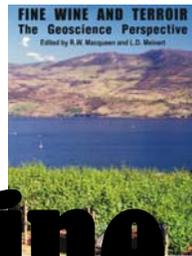
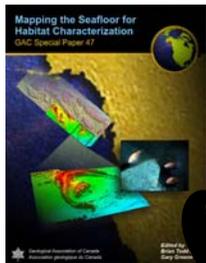


Secretary-Treasurer's Report May 2011

The GAC serves its members and the larger earth science community with a wide range of geoscientific offerings, including the publication of a journal and newsmagazine, special publications, the Annual Meeting, short courses, NUNA conferences, lecture tours, and the programs of the various Sections and Divisions.

Before summarizing the events of the year 2010-2011, I will begin by briefly noting some aspects of the previous annual meeting held in May 2010 not mentioned in my previous report. The GeoCanada meeting in Calgary was hosted by

the Geological Association of Canada (GAC), Mineralogical Association of Canada (MAC), Canadian Society of Petroleum Geologist (CSPG), Canadian Society of Exploration Geophysicists (CSEG), Canadian Well Logging Society (CWLS), International Association of Hydrogeologists – Canadian National Chapter (IAH-CNC), Canadian Federation of Earth Sciences (CFES), and the Canadian Council of Professional Geoscientists (CCPG). This was the second GeoCanada meeting to be held in Calgary, the first having been held in 2000. A 10-year cycle of such meetings is planned for the future. The title of the



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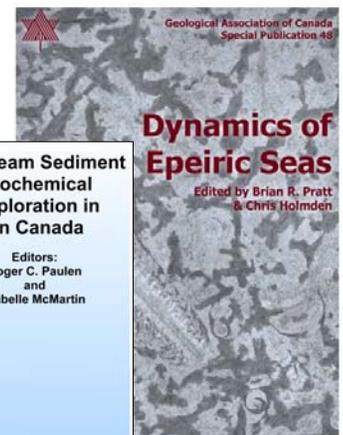
Application of Till and Stream Sediment Heavy Mineral and Geochemical Methods to Mineral Exploration in Western and Northern Canada



Editors:
Roger C. Paulen
and
Isabelle McMartin



GAC Short Course Notes 18



meeting was *GeoCanada 2010 - Working with the Earth*, and it provided a once-in-a-decade opportunity to participate in a reunion spanning the complete spectrum of Earth Science professions. Whether one's focus was petroleum, base and precious metals, groundwater, geophysics, bedrock and seabed mapping, geohazards, uranium or environmental remediation, the latest developments were presented at GeoCanada 2010. There were approximately 900 abstracts submitted and over 4500 registrants attended the meeting.

During the 2010-2011 year, the GAC Council and Executive met twice, in Calgary at the GeoCanada conference in May 2010 and in Ottawa in October 2010. Between these meetings, Councillors and committee members have been in regular communication through e-mail. All information concerning GAC events and business activities is now available on the GAC website (<http://www.gac.ca>) maintained in St. John's.

It is a pleasure to acknowledge the financial and in-kind support provided to our Council by the following organizations. Without this valuable support it would be impossible for Council to conduct the business of the GAC.

Department of Earth Sciences, Dalhousie University,
Halifax, NS

Department of Geology, Acadia University, Wolfville, NS

Department of Earth Sciences, Memorial University of
Newfoundland, St. John's, NL

Kirkham Geosystems Ltd., Burnaby, BC

Talisman Energy, Calgary, AB

Yukon Geological Survey, Whitehorse, YK

Department of Natural Resources, Government of
Newfoundland and Labrador, St. John's, NL

School of Earth & Ocean Sciences, University of Victoria,
Victoria, BC

SIDEX, Montreal, QC

Manitoba Geological Survey, Winnipeg, MB

Canada-Nunavut Geoscience Office, Iqaluit, NU

Environment Canada, Dartmouth, NS

Devon Canada, Calgary, AB

Département de géologie et de génie géologique,
Université Laval, Québec, QC

Geological Survey of Canada, Calgary, AB

Department of Geology, University of Toronto, Toronto,
ON

Department of Earth & Environmental Science, University
of Waterloo, Waterloo, ON

Department of Geology & Geophysics, University of
Calgary, Calgary, AB

CORPORATE SUPPORT (2010-2011)

The Association acknowledges with gratitude the following corporations and organisations for their financial support in 2010-2011:

Patrons

Alberta Geological Survey

Anglo American Exploration (Canada) Ltd.

Memorial University of Newfoundland

Ministère de Ressources naturelles et de la Faune
Newfoundland and Labrador Department of Natural
Resources

Northwest Territories Geoscience Office

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Silver Spruce Resources Inc.

SRK Consulting

Vale, St. John's, NL

Universities

Acadia University

CASP, University of Cambridge

Institut nationale de la recherche scientifique (INRS)

McGill University

University of Calgary

University of New Brunswick

Université du Québec à Montréal

University of Toronto

University of Waterloo

Utah State University

Université Genève

PUBLICATIONS

The following new publications have been produced over the past year and are available GAC Bookstore:

Facies Models 4 (GEOtext number 6, edited by *N. James and R. Dalrymple*)

Exploring for Iron Oxide Copper-Gold Deposits (Short Course Notes number 20 by *L. Corriveau and H. Mumin*)
Application of Till and Stream Sediment Heavy Mineral and Geochemical Methods (Short Course Notes number 18 edited by *R. Paulen and I. McMartin*)

Palaeontographica Canadiana monograph “Gerastos (Order Proetida; Class Trilobita) from the Lower to Middle Devonian of the southern Moroccan Anti-Atlas region” (number 30 by *S. Gibb and B. Chatterton*)

We also now sell – on behalf of their publishers – “Mineral Exploration and Mining Essentials” by R. Stevens, “The Polar Bear in the Rock” by D. Wilton, and “A Mastodon in a Biscuit Box” by P. Russell.

Geoscience Canada editor, Reginald Wilson, continues his dedicated service until the end of 2011. *GEOLOG* editor Karen Macfarlane is stepping away effective May 2011.

Total number of publications distributed in 2009, including those sold on behalf of our Sections and Divisions and other publishers: 2,291, as compared to 2,589 in 2008.

MEMBERSHIP

Individual membership at the end of April 2011 was 1683 compared to 1693 in April 2010. Corporate membership for 2010 is 28 compared with 23 in the previous year.

GAC Council notes, with regret, the passing of the following members: **Ian Helsen, Hans Hofmann, Arnold McAllister, Wulf Mueller and Harold (Hank) Williams.**

GAC continues to stress the importance of attracting student membership through discounted memberships and conference fees. Logan Student Chapters have been established at 10 campuses and all are active. Students and Faculty are encouraged to contact GAC Headquarters (gac@mun.ca) to obtain additional information.

Logan Student Chapters are at the following institutions:

Acadia University
University of Alberta
University of British Columbia
Carleton University
Dalhousie University
Université Laval
McGill University
Simon Fraser University
University of Western Ontario
University of Victoria

GEOLOG

GAC also awards prizes annually to students enrolled in **BSc Earth Science programs** at Canadian universities. The 2011 winners were:

Stephanie Friedrich – Acadia University
Matthew Hardman – University of Alberta
Lyndsay Reid – Brandon University
Nicholas Bueckert – University of British Columbia
Craig Baptie – University of British Columbia, Okanagan
Matea Drljepan – Brock University
Christopher J. Thompson – University of Calgary
Margaret Engelbert – Carleton University
Marc Gasparotto – Lakehead University
Lauren Eggie – University of Manitoba
Ellen Leask – McGill University
Paul Durkin – McMaster University
Jessica Baldwin – Memorial University
Laura Pecharsky – Mount Royal
Alexandra Berger – University of Ottawa
Gabrielle Rochefort – Université du Québec à Chicoutimi
Richard Audet – Université du Québec à Montréal
Kevin Cannon – Queen’s University
Matthew Batty – University of Saskatchewan
Timothy Peters – Simon Fraser University
Robert Wentzell – St. Francis Xavier University
Cooper Stacey – St. Mary’s University
Deng Ngang Deng – University of Toronto
Rebecca Stone – University of Victoria
Adam Lentz – University of Waterloo
Justin Hoyle – University of Windsor

MEDALS AND AWARDS

GAC awards a number of prestigious medals to Canadian and international geoscientists. The 2011 medals were awarded at the GAC Luncheon in Ottawa to the following individuals:

Logan Medal: **Anthony E. Williams-Jones**, McGill University
W.W. Hutchison Medal: **Anton Chakhmouradian**, University of Manitoba
E.R. Ward Neale Medal: **Randall F. Miller**, New Brunswick Museum
J. Willis Ambrose Medal: **Grant Abbott**, Yukon Geological Survey

The Yves O. Fortier Earth Science Journalism Award was awarded to **Karissa Donkin and Hilary Paige Smith** of the Telegraph Journal for their article “Series on Stonehammer Geopark in Southwestern New Brunswick”.

Jérôme H. Remick Poster Awards. Cash awards and certificates of merit are presented at each annual meeting to the presenters of outstanding posters. The Jérôme H. Remick

III Trust Fund supports these awards. The awards at the GAC-MAC in Ottawa are:

Gold: **Thi Hao Bui**, McGill University, Montreal, QC

Silver: **Andrew Brennan**, McMaster University, Hamilton, ON

Bronze: **Jason Hong**, University of Alberta, Edmonton, AB

50 Year Member: **Raymond Yole, Owen White**

Mary-Claire Ward Geoscience Award: Brett Hamilton, University of Calgary, Calgary, AB

Certificate of Appreciation. The award recognizes those members and non-members who have made a significant contribution through voluntary service to the Association. The award consists of a certificate of achievement and this year was presented to: **GAC's representatives on the 2010 GeoCanada Organizing Committee:** Shannon Acton, Keith Dewing and Jeff Packard

Distinguished Service Award. The Distinguished Service



Medallist Grant Abbott

Award recognizes an outstanding contribution to GAC through volunteer work. The award consists of a plaque with the GAC logo, the name of the winner and the particular contribution being recognized. The 2011 awards were presented to: **Sandra Barr**, Acadia University, Wolfville, NS and

Karen Johnston, GAC Headquarters, St. John's, NL

Divisional Awards

Duncan R. Derry Medal. This is the highest award bestowed by the Mineral Deposits Division. It is awarded annually to an outstanding economic geologist who has made significant contributions to the science of economic geology. The 2011 recipient is **Benoît Dubé**, Geological Survey of Canada, Quebec.

William Harvey Gross Award. This is bestowed annually by the Mineral Deposits Division to a scientist under 40 years of age who has made a significant contribution to the field of economic geology in a Canadian context. This year's recipient is **Jacob Hanley**, St. Mary's University, Halifax, NS.

The Léopold Gélinas Medal. The Volcanology and Igneous Petrology Division of the Geological Association of Canada annually presents three medals for the most outstanding theses, written by Canadians or submitted to Canadian universities, which comprise material at least 50% related to volcanology and igneous petrology. *Gold medal* – **Jonathan O'Neill**, McGill University, Montreal, QC for his thesis "The Geology of Nuvvuagittuq greenstone belt and its implications for the Early Earth's evolution".

Silver medal – **Russell Rogers**, Université du Québec INRS-ETE, Quebec City for his thesis "Volcanology and metallogeny of a sector of the Blake River Group, Abitibi Subprovince, Quebec and Ontario".

Bronze medal – **Steven Flank**, Lakehead University, Thunder Bay, ON.

The **Career Achievement Award** of the Volcanology and Igneous Petrology Division for 2011 has been awarded to **Georgia Pe-Piper**, St. Mary's University, Halifax, NS

Michael J. Keen Medal. The medal is normally awarded annually by the Marine Geosciences Division to a scientist who has made a significant contribution to the field of marine or lacustrine geoscience. The 2011 recipient is **Dr. John E. Hughes Clarke**, University of New Brunswick, Fredericton, NB.

The Elkanah Billings Medal. The Paleontology Division awards this medal biennially for sustained research in paleontology. The 2011 recipient is **Graham L. Williams**, Geological Survey of Canada, BIO, Dartmouth, NS.



Medallist Anton Chakhmouradian

Jack Henderson Prize. The Jack Henderson Prize of the Structural Geology and Tectonics Division is awarded for the best Ph.D. thesis and the best M.Sc. thesis. The 2011 recipients are:

Best PhD thesis: **Dawn Anne-Marie Kellett**, Dalhousie University, Halifax, NS for her thesis "Tectonic evolution of the South Tibetan Detachment System, Bhutan Himalaya" Second Prize: **Christoph Schrank**, University of Toronto, Toronto, ON for his thesis "Physical models of shear zones: On the relationship between material proper-

ties and shear zone geometry”

Best M.Sc. thesis: **Tasca Noela Santimano**, McMaster University, Hamilton, ON for her thesis “*Kinematics and mechanisms of upper-crustal deformation in the Eastern Cordillera, southern Central Andes, NW Argentina*”

COMMITTEES

The following standing committees were active in 2010-2011.

Awards Committee: (Tim Corkery, Daniel Lebel, Stephen Johnston, and Karen Johnston) accepted nominations and decided on the recipients of the national medals. The next deadline for these and many other medals and certificates offered by the Association is December 30, 2011. Information on submitting nominations can be found on the GAC website at <http://www.gac.ca/MEDALS/medal.html#awards>. Nominations may be submitted on-line via the website.

Communications Committee: (Tim Corkery, John Hinchey, Shannon Acton, and Lee Pigage) was active in promoting earth science and science education in Canadian schools (K-12), public awareness of science issues, reviewing university nominations for GAC awards and student prizes.

Finance Committee: (Michel Champagne, Toby Rivers, Shannon Acton, Georges Beaudoin, and Karen Johnston) oversaw the investments of the Association and its financial planning.

Science Program Committee: (Don James, Mark Cooper, Andrew Holder, John Nieto, Simon Hanmer, Alana Hinchey, Nancy Chow, Mike Hamilton, Shannon Acton) carefully attended to details for annual meetings scheduled until at least 2013.

Nominating Committee: (Daniel Lebel, Carolyn Relf, Lyn Anglin, Karen Johnston) sought candidates for positions as Officers and Councillors of the Association.

Logan chapters: Kathryn Bethune reviewed applications for grant applications for Logan chapters.

Publications Committee: (Keith Dewing, Reg Wilson, Karen MacFarlane, Karen Dawe, Garth Kirkham, John Greenough, Robert Linnen plus ex-officio members Toby Rivers and Michel Champagne) supervised GAC publications over the past year. Reg Wilson continued as the editor of *Geoscience Canada*, with Chris Pereira and Karen Dawe continuing as Managing Editors. Karen MacFarlane, who was editor of *GEOLOG* from 2004, stepped down in 2011. The position was filled on a pro-tem basis by Karen Dawe. Sandra Barr is GAC’s Books Editor.

Audit Committee: TBA

Safety Committee: Steve Rowins, Donald James, John Hinchey and Karen Johnston

HEADQUARTERS OPERATIONS

GAC Headquarters in St. John’s is operated by a staff of three dedicated long-term employees. Karen Johnston, Finance and Administration Manager, has overall responsibility for operations and financial management, Eleanor Penney is responsible for membership matters and the on-line conference registration system, and Karen Dawe is the Publications Director and manages book and periodical production, order fulfilment and marketing. In addition, Janet Hale works for GAC in a part-time capacity.

FINANCIAL REPORTS

2010 Audit

The 2010 audited financial statements were prepared by the Association’s auditors, Gardner Coombs Winsor Coombs, and were delivered on March 20, 2011. The information was made available to members via the GAC website (members section) together with notice of the Annual Business Meeting. In fiscal year 2010 the Association recorded a small profit of \$16,942, a decrease from the 2009 profit of \$62,744.

The unrestricted net assets (members’ equity) for the Association stand at \$683,871, up from the 2009 level of \$513,858. Other restricted assets of the national GAC are held in four trust funds: the Yves O. Fortier Fund (\$17,309), the Student Internship Fund (\$197,732), the Jérôme H. Remick III Trust Account (\$372,155) and the Howard Street Robinson Trust Account (\$313,139).

2011 Budget

The Association is predicting a positive budget outcome of \$27,352 in 2011 provided that membership and publication revenues meet their minimum targets. The budget includes funds to continue the upgrading of the headquarters’ computer systems and web-services. The “public” side of the website will be transferred over to WordPress software to facilitate upgrading and modernization of the site by GAC staff.

DIVISIONS & SECTIONS

Many of the Divisions publish informative newsletters where detailed reports and topical information can be found. As well, many of the Sections and Divisions have web sites that can be accessed from the GAC website at

<http://www.gac.ca>.

By **Toby Rivers**, Secretary-Treasurer, St. John’s, Newfoundland and Labrador, May 2011

Annual Invitation for Grant Applications

The **Canadian Geological Foundation** (CGF) invites all interested parties to submit grant proposals for the next round of grants selection (see deadline and other information below). The Foundation was established in 1968 as a non-profit, charitable organization dedicated to assist in the development of geological sciences in Canada. In principle, grants are made only in support of activities of national interest and broad significance, with emphasis on those of long-term importance. Grants are made only on the basis of written applications giving a summary and detailed budget of the proposed project. The Foundation disburses more than \$150,000 annually.

Worthy projects are broadly those that meet one or more of the following criteria:

-promote public interest in the value of geological sciences to society
-aim to provide training to high school teachers in the field of earth sciences
-further the application of geological sciences to the development of natural resources through national seminars and conferences
-provide career education through the preparation of booklets on geological sciences
-support for the publication of special scientific papers involving national cooperation
-result in publication of general geology textbooks, displays, videos and films emphasizing Canada and involving national co-operation. And
-involve geological societies in co-operative projects of national, long-term significance

Starting in 2010, CGF made some significant changes to its granting procedures. The most visible change to CGF project proponents is a move to a three-tiered grant system related to the size of the grants being requested. Grant requests will be evaluated in competition with other requests within the same tier. For example, small grant proposals will initially be in competition with other small grant proposals for the share of that year's disbursement total allocated to this tier. Adjustments to the totals within each tier may be considered at the recommendation of the grant selection committee.

The three tiers are:

Small Grants <\$10,000 Grants of less than \$10,000 have been the norm for CGF historically and it is anticipated that small grants will continue to be an important part of our disbursements with the largest number of individual grants. The granting application and approval system will have the same criteria, scope of project and application procedures as in the recent past. Our target for small grants is approximately 30% of the annual quota.

Medium Grants \$10,001-\$30,000 Until recently, CGF has not had the resources to consider grants in the range \$10,000 to \$30,000. However, the foundation is now sufficiently endowed to consider making a few somewhat larger grants in any given year. These grants will allow proponents to consider making proposals of a more substantial nature. Granting application and approval systems for these grants will be similar to our current systems. Notionally, we expect to set aside about 45% of the annual quota, although because the individual grants are larger, there will be fewer of them available than the small grants.

Large Grants The foundation will consider making one larger grant per year of up to \$45,000. These grants, because of their size, will allow a broader scope of work than the small and medium grants and will also require a more rigorous application and budget. Large grants will only be available to institutions or associations with capability to carry out large projects.

In addition, the foundation is now willing to consider the possibility of **Multi-Year Grants** (ie approval of a continuing grant for specific amounts to be paid in each of up to 4 years). Such grants will provide an opportunity for applicants with a specific need for a multi-year as opposed to a single year larger grant. The rationale for a multi-year grant will need to be strong, well justified, and with clear milestones. A multi-year grant would be appropriate for projects with a long lifespan and well developed expenditure milestones or a well defined series of events that can serve as milestones. The annual expenditures for the project would be allocated in each year to the money available for small or medium sized projects (depending on the annual expenditure). These grants will require a separate, more rigorous application process, with strict milestones and deadlines.

Each application for a grant is appraised on its own merits in relation to the general objectives of the Foundation and the monies available within the tier of the proposal. The Secretary must receive all applications before March 31. For any given year, all recommendations of the Grants Committee are first considered for approval at our Annual Meeting and by the Board of Directors at its Spring meeting at the annual GAC–MAC meeting. Applicants are notified within one month of the Directors' meeting. Results of the competition are published each year in *GEOLOG* and will be posted on the CGF web site.

Application forms and detailed instructions are available on the CGF website at www.canadiangeologicalfoundation.org

Applications should be submitted electronically to the Secretary. Applicants are urged to read the instructions completely to ensure that their application meets the Foundation's grant criteria and that it is properly completed. Incomplete applications will not be returned for correction.

Queries about the **Canadian Geological Foundation** should be addressed to the Secretary:

Dr. Stephen Johnston; School of Earth & Ocean Sciences
 University of Victoria; P.O. Box 3055
 Victoria, BC V8W 3P6
 Tel: (250)-472-4481; Fax: (250)-721-6200; Email: stj@uvic.ca



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The Geological Association of Canada (GAC[®]) and the Mineralogical Association of Canada (MAC) are returning to North America's oldest city, St. John's, Newfoundland and Labrador, in 2012 for their Joint Annual Meeting – *Geoscience at the Edge*. The venue is situated on the edge of the North American continent and the technical program promises an array of topics on cutting-edge geoscience. The meeting will feature over forty symposia, special and general sessions, short courses and field trips. The Local Organizing Committee for GAC[®]-MAC 2012 proudly invites you to attend this exciting conference, to experience the rich culture, stunning natural beauty and dynamic nightlife that the City of Legends boasts.

En 2012, à l'occasion de leur réunion annuelle conjointe « Géosciences de pointe », l'Association géologique du Canada (AGC[®]) et l'Association minéralogique du Canada (AMC) reviennent à St. John's de Terre-Neuve, la plus ancienne ville d'Amérique du Nord. « Géosciences de pointe » parce que l'événement aura lieu à la bordure du continent nord-américain, et parce que le programme des présentations techniques portera sur les dernières réalisations en géosciences. Cette réunion comportera plus d'une quarantaine de symposiums, de séances générales ou spécialisées, de cours intensifs et d'excursions. Tous les membres du Comité d'organisation de l'AGC[®]-AMC 2012 vous invitent cordialement à assister à cet événement passionnant qui vous permettra de goûter la riche culture, l'étonnante beauté du paysage et les soirées animées de la Ville des légendes.

ON-LINE : Registration, abstract submissions and more information

PAR L'INTERNET : Inscription, soumission de résumés et information



Contact / Pour Nous Joindre : Alana Hinchey, Steering Committee Chair / Présidente du comité directeur
 Geological Survey, Department of Natural Resources, Government of Newfoundland and Labrador
 alanahinchey@gov.nl.ca

www.stjohns2012.com

