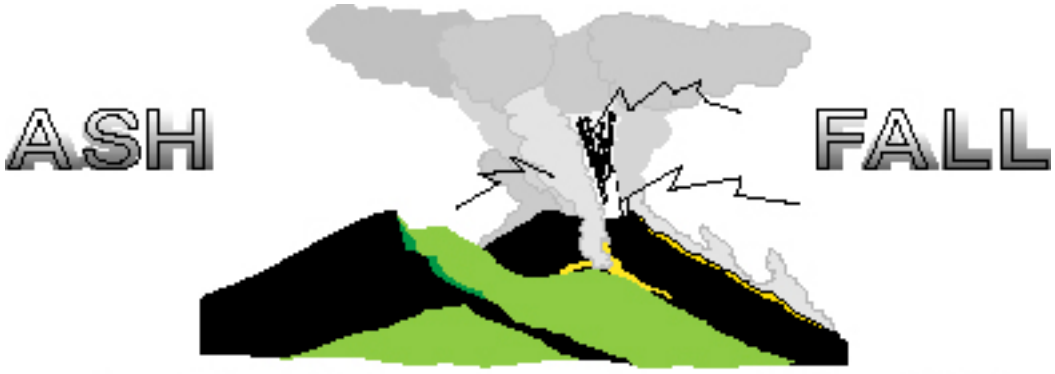


Newsletter of the Volcanology and Igneous Petrology Division
Geological Association of Canada

No. 60 November, 2005

Hello VIPers! Welcome to the newest edition of Ashfall. For the first time, Ashfall is being made available to members via the VIP website (hosted by the GAC website). This avoids problems with the limited size of e-mail mailboxes, particularly for those of you with Hotmail addresses. We will also be keeping archived copies of Ashfall on the website so that new members (in particular) can go back to see what we were up to in recent years.

MESSAGE FROM THE CHAIR

Summer and autumn 2005 have been a very busy time for our division, as you can see from this edition of Ashfall. First of all I would like to thank everyone for the great participation at the annual VIP meeting in May in Halifax at Dalhousie University during the 2005 national GAC-MAC meeting. It was great to have such a strong participation from our small division. As you may (or not!) know we elected new councilors and many new ideas were discussed. The elected councilors are Glyn Williams-Jones of Simon Fraser University (West), Renée-Luce Simard of Brandon University (central), and Nancy van Wagoner of Acadia University (east) with the student councilor being Tony Barresi from Dalhousie University. I hope we can all get together in Montreal 2006. This brings me to the agenda of Montreal 2006. Below you will find the following special sessions and excursion supported and sponsored by our division. I hope you might consider attending some of these interesting sessions and excursions.

VIP-sponsored Special sessions GAC/MAC Montreal 2006:

1) Earth's mantle: new insights from diamonds and xenoliths.
Conveners, Maya Kopylova and Don Francis
2) TTG, adakites and high-Mg andesites: modern and ancient analogues
Conveners, Ross Stevenson and Ali Polat
3) Physical volcanology, textures and geochemistry of komatiite and basalts flow fields
Conveners, Wulf Mueller and Jarda Dostal

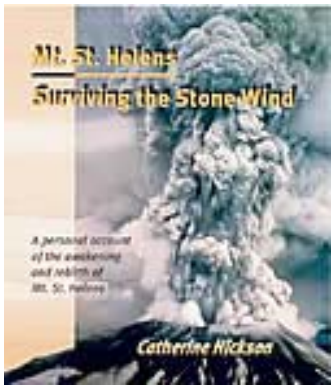
Excursions GAC/MAC Montreal 2006:

1) The komatiite-komatiitic basalt-basalt association: physical volcanology and textures of subaqueous Archean flow fields in the Abitibi belt
Field trip leaders: Wulf Mueller, Real Daigneault, Vital Pearson, Pierre Pilote, Jarda Dostal, and Michel Houlé
2) Diatremes, dykes, and diapirs: revisiting ultra-alkaline to carbonatitic magmatism of the Monteregian Hills
Field trip leaders: David Lentz, Nelson Eby, Adrian Park, and Serge Lavoie

For those of you who have yet seen our new website please take a look at http://gac.esd.mun.ca/VIP/. Marg Brazil has done a great job, and Brian and Jarda were instrumental in setting up this site. Any new suggestions to improve the site are welcome. The more input from the better we can make it for our members and for international clients who want to know what is going on the physical volcanology and igneous petrology front in Canada. So enjoy this Ashfall and thanks for all the contributions.

Cheers. Wulf Mueller

VOLCANOLOGISTS IN THE NEWS
As was the case last spring, Kilauea and Mt. St. Helens are keeping the US Geological Survey and other volcanologists very busy. For those of you that did not know, Cathy Hickson of the GSC (Vancouver) has a new book out on her experience at Mt. St. Helens in 1980, entitled "Mt. St. Helens: Surviving the Stone Wind" (Tricouni Press, 2005).



Copies are available at Chapters/Indigo and other bookstores, presumably. The GSC Bookstore in Ottawa also has a number of copies for sale. I know that Cathy was in Ottawa a few weeks ago, doing interviews on local television stations about her book and volcanoes in general. My mother actually phoned me at work to let me know that Cathy was on TV! Great to see any topic in earth sciences (and especially volcanology) getting lots of airplay, so congratulations Cathy!

ROBERT W. DECKER TRIBUTE: by Jill Karsten, American Geophysical Union
Robert W. Decker (78), internationally-renowned volcanologist and former Scientist-in-Charge at the Hawaii Volcano Observatory (1979-1984) died at his home in California on June 11, 2005, following a sudden, unexpected downturn in his fight against cancer. Noted for his pioneering research on geophysical monitoring of active volcanoes and statistical methods for forecasting volcanic eruptions, Bob established much of the infrastructure now in place at HVO. In 1989, he founded the Center for the Study of Active Volcanoes at the University of Hawai'i-Hilo, a cooperative HVO-UHH effort to train scientists from around the world on volcano hazards monitoring. Originally from

Pennsylvania, Bob was educated at MIT (BSc and MSc) and the Colorado School of Mines (DSc). He was a member of the faculty in the Geophysics program at Dartmouth College (1954-1979) and an employee of the US Geological Survey (1979-1990). In the mid-70's, he served a four year term as President of the International Association of Volcanology (IAVCEI) and was elected AGU Fellow in 1968. In recent years, Bob and his wife, Barbara, wrote several popular science and travel books, including the textbook "Volcanoes" and "Volcanoes in America's National Parks." Donations may be sent to the Robert Decker Memorial Scholarship at the Center for the Study of Active Volcanoes, UH-Hilo, 200 W. Kawili St., Hilo, HI 96720.

(reprinted from EOS, American Geophysical Union)

IN MEMORIAM: RON EMSLIE, by Brian Cousens

I was walking out of my office early this week and bumped into my colleague, George Skippen who told me that Ron Emslie of the Geological Survey of Canada had passed away. Ron died at home on Monday, November 14th, at the age of 73. His funeral was held in Ottawa on Friday, November 18th. Ron was awarded the Career Achievement Award of this division of the GAC in 2001 for his work in anorthosites and anorogenic granite complexes, among other things. The following is an excerpt from his acceptance speech at the 2001 GAC-MAC meeting that touches on many of the contributions that Ron made to igneous petrology:

It is an honour and a pleasure to accept this career award from my scientific peers. Of course, realization that one is approaching the end of a career is reason to give anyone pause - but it also offers an opportunity to recall with warmth, some of the events and the people who influenced and shared my path. My introduction to, and interest in, basic igneous rocks as an undergraduate came from Bruce Wilson at the University of Manitoba and was later nurtured as a graduate student at Northwestern University with Arthur Howland who introduced me to the layered anorthosites of the Stillwater intrusion. I have always been convinced that a thorough grounding in structures and textures of layered cumulate rocks was an important preparation for attacking petrological problems of massif anorthosites.

A year of teaching at Queen's provided an opportunity to meet and subsequently collaborate with Peter Roeder who kindly furthered my interest in the possibilities of laboratory experiments to solve some of the petrological problems of anorthositic rocks. We shared a field season visiting the Michikamau, Harp Lake and Kiglapait intrusions in Labrador where Pete briefly got to pursue his passion for fly fishing - unfortunately with limited success. Soon after, Don Lindsley advanced my interest in experimental petrology and introduced me to the capabilities of the 50 kilobar press. Don's experimental investigations and those of his students on a wide range of petrological problems have had an important influence on progress in understanding the AMCG (anorthosite-mangerite-charnockite-granite) suite of rocks.

The Nain Anorthosite Project, initiated by E.P. (Pep) Wheeler 2nd, Dirk de Waard, and Tony Morse who was the driving force, provided valuable leadership in research on these rocks in the seventies and eighties. Over the years I have had the good fortune to share field seasons with many personnel of the Newfoundland Department of Mines and Energy, notably Bruce Ryan and Charlie Gower. These occasions have been mutually beneficial and productive - as well as being enjoyable experiences. The opportunity in 1994 and 1996 to collaborate with a number of these Labrador hands in organizing and running field excursions in the Nain area is especially memorable despite some difficult logistics.

At present, an eager new crop of young investigators is producing exciting results in research on anorthosite massifs and related rocks. Among them are Jacqueline Vander Auwera, Mike Hamilton, Gregor Markl and James Scoates who I am very pleased to note, received the MAC Young Scientist award at this meeting. These are a few that come immediately to mind who have been making significant contributions to problems of petrology, geochemistry, and geochronology and isotope geochemistry of these rock suites.

I had the honour of working with Ron Emslie for the summer of 1979. I was a fresh, newly-minted B.Sc. who thought that he knew what he was doing in the field – yeah, right! My first mistake, on day one of the field season, was to leave the wooden keel of a Zodiac sitting in the warehouse in Schefferville, QC., So four guys had to get to their traverse locations using only one boat for the first two weeks of the field season! Fortunately, Ron was a very patient boss, and I learned a lot from him that summer. Ron was enthusiastic about geology, but in a quiet way. As you can see in the photo, Ron (on the right) smoked a pipe, and I think that this was one of his calming influences. Ron and I (sitting to Ron's right) and our two juniors (Jack Bielecki behind me and Chris Hamblin on the left) spent an excellent last two weeks of the summer on Horseshoe Lake, and impact crater in anorthosites of the Mistastin Lake intrusion. The photo on the left is of the four of us at camp. After moving to Vancouver and then on to Santa Barbara, I did not see Ron again for almost ten years, so in 1989 I made a point of dropping by his office at the Survey to say hi. Although he didn't recognize me right away (note all the hair that I had in 1979 that was mostly gone by 1989!), he was really happy to see me again and we spent quite a while chatting about things that we had done since we left Mistastin Lake. We even got a chance to work together on a study of the mineralization at Voisey's Bay not long after my arrival at Carleton. It was a lot of fun!

We will miss Ron very much.

GAC-MAC ANNUAL MEETING, HALIFAX, NOVA SCOTIA, MAY 2005

As part of the annual GAC meeting last May, the VIP Division held its annual business meeting at noon on May 18th. This was without a doubt the most successful annual business meeting held in the past several years, with over 30 members in attendance! Several important items were on the agenda, besides the awarding of the Gelinas medals. Among these, the executive announced that the VIP website has been completely revamped thanks to the efforts of Kelly Russell, Wulf Mueller and the GAC

webmaster, Marg Brazil. Also, new councilors were elected to fill a number of open positions. The next GAC-MAC Annual Meeting will be held in Montreal in May, 2006, with VIP-sponsored Special Sessions and field trips focused on komatiites, kimberlites, TTG suites, and the Earth's mantle, among other topics.

Planning for the 2007 meeting in Yellowknife is underway. In order for the meeting to be a success, it is critical to offer outstanding sessions and field trips. The VIP Division has been approached by the meeting organizing committee and asked to offer a short course related to volcanism, both modern and ancient, perhaps linked to mineral deposits. Nancy van Wagoner suggested that the title of the session might be "Volcanic Facies and Mineral Deposits", with the one-day session split between presentations and a field trip to the Giant Section and other locations within the city. Whereas this would offer the opportunity to update the GAC/VIP Volcanic Facies Models volume, there was some debate as to whether a special session dedicated solely to physical volcanology would bring in the numbers required for a successful short course. Given the potential to attract MDD members to the session, a link to mineral deposits would boost attendance.

For Quebec City 2008, both a symposium and field trip on ophiolites and terrane boundaries is planned (Rejean Hebert). Also suggested was a session on Proterozoic magmatism, and a session dedicated to volcanism and tectonism.

Financially, the Division is in excellent shape, as indicated in the financial report below. In the opinion of the Treasurer, we have a $3K surplus that we should try to put to use for the Membership. Part of this will go to cover up-front costs associated with the short course in Yellowknife, but we should later receive revenues from publication of the short course volume.

GAC Volcanology and Igneous Petrology Division
2004 Annual Financial Report

Opening Balance:	**4007.34**	
	Credits	**Debits**
Dues	684.00	
Publication Sales	170.36	
Annual Mtg		512.90
Ash Fall newsletter		34.79
Office/postage/photocopying		159.54
Award Medal Engraving		159.86
Bank Charges		47.40
Total	**854.36**	**914.49**
ClosingBalance	**3947.21**	

Note that we currently have only one publication, the Mexican Field Guide, that is now a bit dated and should be revamped (this is a very popular field trip destination). Jarda Dostal and Brendan Murphy volunteered to spearhead this effort.

Gelinas Awards and Career Achievement Award

The recipient of the Bronze Gelinas Award for the best B.Sc. thesis in 2004-2005 was Christopher Hamilton of the Department of Earth Sciences, Dalhousie University. His thesis is entitled "Ice-Contact Volcanism in the Vifilsfell Region, Southwest Iceland", and his supervisor was D.B. Clarke. The following citation was given by Jarda Dostal:

The thesis is a comprehensive study of ice-contact magmatism in the Vifilsfell Region, southwestern Iceland, which combines physical volcanology, remote sensing and lithogeochemistry. Christopher aimed to determine paleo-environmental conditions affecting the emplacement of volcanic lithofacies in the Vifilsfell Region. He began his project as an exchange student in Iceland, and finished the work at Dalhousie in his final year. For his thesis research, he received the award for the best paper at the Atlantic Universities Geological Conference at Halifax and as well as the award for the best student paper at the annual meeting of Atlantic Geoscience Society in Moncton.

Christopher is now a Ph.D. candidate at the University of Hawaii (Manoa) and was unable to attend the meeting, but sent the following acceptance letter:

Good afternoon. I am very honoured to have been awarded the Bronze Léopold Gelinas Medal for 2005 by the Geological Association of Canada. I regret that I cannot be with you today, but I am currently in Hawaii preparing for another summer field season in Iceland.

I would like to briefly provide you with a context for my undergraduate research and specify its relationship to my current studies and future goals, namely, the study of volcano-ice interaction and the search for water on Mars.

My undergraduate thesis would not have been possible without the support of members of the Dalhousie Earth Sciences Department—particularly, Gunter Muecke, Marcos Zentilli, Lawrence Plug, and Barrie Clarke—who encouraged me to study abroad and write a thesis based on my research in Iceland.

My experience abroad had a formative influence on my life and has affected the course of my career in ways that I could not have imagined. In 2002, I moved to Reykjavik to study at the University of Iceland for one year. Shortly after my arrival, I met Johann Helgason and Magnus Tumi Gudmundsson, both of whom independently introduced me to various aspects of subglacial volcanism. I was fascinated by the underlying eruption mechanisms and potential analogues between volcano-ice interaction on Earth and Mars. I began visiting outcrops at every opportunity and soon focused on studying Vífislfell, which I could see from my window in Reykjavik. During the winter months, I concentrated on a literature review and remote sensing analysis. When the snow melted in the spring, I then began an intensive field campaign and collected samples for processing in Canada. Though I completed my thesis the following year, I knew that my work in Iceland represented only the beginning of my research career and a lifetime association with Iceland.

I am currently pursuing a doctorate degree at the University of Hawaii and I am fortunate that my research allows me to continue exploring volcanism in Iceland and develop my interests in Planetary Sciences. Specifically, I am investigating the products of explosive lava-water interaction on Earth and Mars. My work combines classical field-based observations in Iceland with artificial intelligence techniques to automatically classify volcanic landforms in satellite imagery. The purpose of the project is to develop a detailed model of how explosive interaction between lava and groundwater can generate rootless cones on Earth. Once I have developed a sound model and I can then use it to interpret the

environmental significance of rootless cone analogues on Mars.
The overarching goal of both my undergraduate thesis and doctorate dissertation is to understand the mechanisms of volcano-ice interaction and thereby use volcanic landforms to infer the spatial distribution and abundance of water on Mars through time. Identification of near-surface water and concentrations of hydrothermal mineral deposits will be crucial prerequisites for extended missions to Mars and eventual human settlement. I, therefore, hope that my life's research will help to facilitate the exploration of the solar system by locating resources that will be required by future generations. My undergraduate research was a first step towards this goal and I am very grateful for the help that I have received from all of my teachers and, particularly my thesis advisor, Barrie Clarke. Thank you.

The recipient of the Silver Gelinas medal for the best M.Sc. thesis was Margaret Harder from the Department of Earth and Ocean Sciences, University of British Columbia, for her thesis: The Llangorse Volcanic Field: Volcanology and Mantle petrology", supervised by Kelly Russell. The following citation was provided by Brian Cousens:

It is my great pleasure to announce the winner of the Silver Gelinas medal for the best M.Sc. thesis of 2004-05, Margaret Harder from UBC. I would first like to acknowledge the three other candidates for the award, Christine Champagne from UQAC, Alexandre Aubin from UQAC, and Russell Hiebert from Acadia, all of whom wrote excellent theses and made the choice of a winner very difficult. Margaret's thesis was a study of the volcanology and geochemistry of Holocene mafic alkaline complexes in northwestern BC, and inferences on lithospheric mantle variations in the northern Cordillera. She began with an interpretation of flow emplacement mechanisms and interactions between lava flows and glacial ice, and followed with geochemical analyses of mantle xenoliths from the flows. This led to a model for the thermal and compositional structure of the lithospheric mantle beneath the alkaline complexes, based on P-T estimates from different lherzolite types. This allowed Margaret to test previous petrological models for the origin of these young alkaline complexes in the northern Cordillera, as well as to compare and contrast models for lithospheric structure of the area. The combination of field, laboratory, and modeling work is exemplary, and deserving of the Silver Gelinas medal for 2005. Congratulations, Margaret!

Margaret was not able to attend the meeting, since she was working in northern BC at the time.

The Gold Gelinas award for the best Ph.D. thesis was awarded to Steven Quane from the Department of Earth and Ocean Sciences, University of British Columbia, for his thesis "Welding in Pyroclastic Flows", supervised by KIelly Russell. The citiation was read by Wulf Mueller:

It is with pleasure that I announce our choice of the Leopold Gélinas Gold Medal, for the best 2005 PhD-thesis in Volcanology & Igneous Petrology. Steven L. Quane from the University of British Columbia has submitted an excellent thesis, entitled 'Welding in pyroclastic flows'. From this thesis, 4 papers in international journals have surfaced within the last year. His study was a unique combination of field and experimental work concerning welding in subaerial pyroclastic flows. Several aspects were considered in this study, including the degree of welding in pyroclastic rocks and how this can be physically quantified

(Bull.Volcanology 2005). In order to test this, Steven designed a low-load, high temperature apparatus to experiment with glass beads, pumice and volcanic ash (American Min. 2004). Another two publications with Dr. Kelly Russell (Jour. Vol. Geothermal Res. 2005) discuss the results of the experiments and the various conditions of temperature, load and glass transition temperature under which welding occurs. Basically his data set enabled to construct constitutive laws for the rheology of welding and compaction. Dr. Steven Quane has written an innovative and highly interesting thesis that will be the bench mark for defining welding processes for years to come. Congratulations and all the best for the future.

Steven was unable to attend the meeting, but sent the flowing acceptance letter:

I am honored to receive the 2005 Gelinas Gold Medal. Regrettably, I will not be able to personally accept it at the meeting in Halifax. I leave that to Alison Rust's capable hands. Currently, I am a Visiting Assistant Professor at Colorado College and because we are on the block plan (one class at a time) my class schedule does not permit me to get away.

I want to express my gratitude to GAC-MAC and its Volcanology division, in particular, for selecting me. The level of both Canadian and International Geoscience that GAC-MAC supports is very impressive and being recognized amongst the extraordinary list of previous winners is quite an honor. I would also like to thank Dr. Kelly Russell and the Igneous Petrology Lab at UBC for nominating me and for striving to be a part of the solution.

Receiving the Gelinas Gold Medal was a goal of mine when starting my PhD research and winning it will be a long-lasting and cherished memory.

The Career Achievement Award for 2005 was given to Jarda Dostal of St. Mary's University, Halifax. The citation was given by Brendan Murphy, and the following is a copy of his nomination letter:

In recognition his lifetime scientific contributions to the field of Volcanology and Igneous Petrology, I wish to nominate Dr. Jarda Dostal for the Career Achievement Award of the Volcanology and Igneous Petrology Division of the Geological Association of Canada. Indeed, I consider it an honour and a privilege to do so. Jarda's research career is now well into its fourth decade, and his publications are impressive both in terms of quantity ***(225 refereed papers alone, at the last count!)*** *and quality. He has published in a wide variety of prestigious journals, on the national and international scene. For much of this time, his work has focused on mineralogy, geochemistry and petrology of igneous rocks. However, a cursory look at his CV will show that this is a gross oversimplification. He has tackled every important petrological process from mantle evolution, to magma mixing to liquid immiscibility in rocks ranging from Archean to recent in age! His contribution to any one of these fields of research is sufficient to have merited a first-class international reputation. Taken together his contributions are truly outstanding, and for the rest of us mere mortals, humbling.*

He also instigated, managed and maintained the X-Ray Geochemical Centre at St. Marys, where all of us get out staple diet of major and trace element analyses performed. This lab has gone through a series of upgrades over the past 20 years. The efforts to obtain these upgrades were spearheaded by Jarda in the form of several grant proposals to NSERC. The national success rate of these proposals is very low, and Jarda's success is testament to his reputation as a geochemist and in his adroit skills at managing the Centre.

Jarda completed his undergraduate at Charles University in Prague in 1964, left Czechoslavakia during its troubled 60's and emigrated to Canada. After completing his Ph.D. studying the geochemistry

and petrology of Loon Lake in Ontario in 1974, Jarda became a professor at St. Marys University in 1975, where he has been ever since. For 12 of those years, he has served as department chair. I often complain that serving as chair is supposed to slow one's research down, but Jarda's track record shows no such effect, he really is an unstoppable force! Either that or his brakes are worn out!

By the time Jarda had finished his PhD, he already has 8 publications in refereed journals, predominantly in the field of mineralogy (from amphiboles to asbestos), and there was one paper that included the results of field mapping.

Many of his early papers were on uranium and rare earth geochemistry, in igneous and metamorphic rocks ranging in age from Precambrian to Recent in regions such as Sardinia, Algeria, Iran, the Canadian Shield and the Andes. Taken together, his studies on the distribution of uranium and related elements in volcanic rocks is an enormously impressive contribution, spanning much of the geologic column and in all corners of the globe (including Nova Scotia). These studies were many years ahead of the vast volume of literature that ultimately related these elements to a combination of primary and secondary processes. Once again, in his insights and research interests, Jarda demonstrated that he was well ahead of the bandwagons.

Not content with the geographic limitations of continents, he also got involved in Deep Sea Drilling Projects. In the late 1970's his work around the Mediterranean expanded to include Greece, the western Alps and the Massif Central, and other parts of northern Africa.

During this time, Jarda was one of the first to point out that continental tholeiites may not fit into traditional trace element discrimination diagrams (all the rage at the time) because of their crustal contamination, principles he used to great affect in his studies on the Precambrian, Paleozoic and Mesozoic continental tholeiitic rocks in Atlantic Canada. His work on the tholeiitic basaltic rocks in Coppermine (1984) and Natkusiak (1986) basalts stimulated much discussion and further research on the petrogenesis and tectonic setting of these rocks, debates that continue to this day.

By the early to mid 1980's Jarda had become became a world authority in the various manifestations of igneous rocks, modern and ancient, and on a wide variety of petrological processes associated with their genesis. Jarda tackled important petrological problems "head-on" by providing compositional constraints and textural insights in order to predict their tectonic environments. By the late 1980's, Atlantic Canada had begun to reap the dividend from Jarda's accumulated expertise. By that time, he had authored or co-authored papers on virtually every conceivable age and type of igneous activity in the Appalachians, then, a type pre-Mesozoic example for the relationship between igneous and plate tectonic processes . Jarda's thinking was well ahead of the pack and most of his basic conclusions are still as valid as the day they were written (not many of us can say that!).

In the 1990's, of more than 80 publications, several stand out as landmarks. For example, his 1992 paper (with Mueller) on Archean shoshonites in the Abitibi is important because it provides clues as to whether modern environments can really provide actualistic analogues for Archean settings. His 1996 paper on the inception and demise of a pre-Pan-African ocean basin in Algeria is a very important contribution to our understanding of Neoproterozoic global-scale orogenic activity and has implications for the tectonic setting of our own Avalonian belt. In a 1996 and 1998 papers on the ocean island basalts from French Polynesia, he showed how the distribution of light elements such as boron, lithium and beryllium may be used as tracers for the character of subducted components. These are first-order contributions to our understanding of subduction zone processes and, true to form, will no doubt will be applied to Atlantic Canadian geology in upcoming studies. His papers on the early Mesozoic dykes of Atlantic Canada also stand out as a contribution to our understanding of the timing, setting and igneous manifestations of divorce from our Late Paleozoic neighbours.

Most recently, Jarda has focused much of his research on the "terra incognita" of southern Mexico, using igneous petrology and geochemistry to constrain evolution of magmas in a wide variety of settings. He has made a considerable contribution to the understanding of the 1 billion year old Oaxacan complex, which is a portion of a Grenvillian orogen that has been dismembers by the breakup of Rodinia, Gondwana and Pangea. This is a crucial piece of work because it constrains Neoproterozoic continental reconstructions.

And so 30+ years after Jarda embarked on his research career, we look at his publications over the last 3 years and what do we see? Nearly 30 refereed publications! In addition to continued research into Neoproterozoic to Mesozoic igneous complexes in the Caledonide-Appalachian orogen, there are papers on Paleoproterozoic to Mesozoic magmatic events in Greenland, Mexican igneous complexes ranging from Paleoproterozoic to Mesozoic in age, continued research into the Archean of northern Canada, the accreted igneous complexes of western Canada, and many more.

Jarda's research has been innovative with a level of sustained excellence that for over 30 years. The breadth and depth of his contributions spans some of the most fundamental concepts in the field of mineralogy, geochemistry, igneous petrology and their relationship to tectonics. Jarda should serve as an inspiration to the modern crop of Ph.D. students in igneous petrology. He tackled some of the most important petrological challenges of our time and consistently provided novel and plausible insights into fundamental processes responsible for them. In bringing and maintaining state-of-the-art analytical equipment to Atlantic Canada, his contributions have provided the infrastructure for many more researchers.

Jarda has been a great supporter of the geoscience community over the years most notably as chair of the A.P.I.C.S. (Atlantic Provinces Council on the Sciences) committee on the Earth Sciences. He is a regular attendee of the annual A.U.G.C. meeting, where undergraduate student research projects in Atlantic Canadian universities are presented. Although he tends to stay in the background, late in the evening he can be found in reasonable proximity to the bar (a Czech custom, no doubt) waxing most eloquently about the complexities of igneous geochemistry. I confess to have learned most of my geochemistry on the adjacent bar-stool.

Jarda is a scientific leader. He was always well ahead of the pack throughout his career. He is within two years of "retirement" and I believe it is time to formally recognize his lifetime contribution. He would be a most deserving recipient of the Career Achievement Award of the Volcanology and Igneous Petrology Division of the GAC. Halifax 2005 would be a great venue for such an occasion.

Sincerely,

Brendan Murphy

Jarda Dostal accepting his Career Achievement Award from Wulf Mueller (left) and Brendan Murphy (citationist, right).



From left to right: Chris Hamilton, Maggie Harder, and Steve Quane, the 2005 Gelinas Medal winners!

SOUFRIÈRE HILLS VOLCANO – TEN YEARS ON…
By Crystal P. Mann

Looking SE from St. Georges hill down onto what remains to date of Plymouth, capital city of Montserrat.

The Soufrière Hills Ten Years On scientific conference, 24 to 30 July 2005, marked 10 years of volcanic activity from the Soufrière Hills volcano. On 18 July 1995 the eruption began with a phreatic phase containing small amounts of ash. From 1995 to present, the volcano has been through a series of dome building phases culminating in dome collapse. A dome collapse, July 2003, marked the end of magmatic extrusion for almost 2 years (July 2003 to June 2005) and up until June 2005 a persistent gas plume has been the climax of eruptive activity. In June 2005 periodic ash venting resumed and during the conference multiple venting episodes put on quite a show for conference participants.

July 25, 2005, eruption of Soufriere Hills volcano.

Planning and organizing the conference was a big task for this small island. The conference attracted approximately 100 attendees including American, Canadian, Caribbean, European and Japanese Scientists. The conference theme was Soufrière Hills and while majority of the papers focused on research dedicated to the volcano, many complimentary papers put processes at hand, in a much

larger scope. The opening ceremony began with remarks from Her Excellency Governor, Deborah Barnes Jones followed by the Honourable Chief Minister John Osborne and the Chairman Dr. Richard Robertson. One evening Her Excellency Governor, Deborah Barnes hosted the participants at her home and another evening consisted of a BBQ and local performance hosted by the Vue Pointe hotel.

The field trip lead by Dr. Steve Sparks, University of Bristol, Dr. Geoff Wadge, University of Reading and Dr. Sue Loughlin, Director of the Montserrat Volcano Observatory, took participants to the South of the island into the relic capitol city of Plymouth (Figure 5; Figure 6) and over to the North to look at block and ash flow deposits and the remains of the airport. The conference sessions were single session so all participants were able to learn about research taking place outside their specialty.

House in Plymouth, the capitol city, gradually buried by lahars with Soufrière Hills in the background. Note the volcanic gas plume.

At the close of the conference it became quite clear, as Dr. Louglin put it, that "The challenge to understand this volcano goes on, but one must also consider the vast amount that has already been learnt." Students just beginning their research on Montserrat and researchers whom have already spent a large amount of time on island, left the conference inspired and looking forward to the future.

NORTH MOUNTAIN BASALT FIELD TRIP REPORT, MAY 2005

Contributed by Dan Kontak, Jarda Dostal and John Greenough

(Note: this is a condensed version of the field trip account on the VIP website)

The North Mountain Basalt (NMB) of southern Nova Scotia represents a small segment of one of the world's great igneous provinces, the Central Atlantic Magmatic Province (CAMP), that contains an estimated volume of 2 x 106 km3 of basalt (Mazaroli et al., 1999). The large outpourings of large continental flood basalt provinces are important for many reasons, foremost of which is that they relate to turbulent times in the aesthenosphere, hence they reflect large-scale tectonic processes, and such volcanism has a causative link to mass extinctions, possibly due to its catastrophic impact on global climates (Marzoli et al., 2005). Thus, understanding all aspects of large

continental flood basalt provinces such as CAMP and others (e.g, NMB, Deccan Traps of India, Paranna basalts of South America, Columbia River basalts, USA) is essential to deciphering, among other things, the evolution of the mantle, the atmosphere and life itself.

Although not significant in terms of overall volume of erupted material, the NMB offers spectacular, almost continuous exposure along a ca. 200 km long, picturesque, marine coastline of the Bay of Fundy, southern Nova Scotia. Contained in the exposures are exceptional examples of well-preserved petrological and volcanological wonders that reflect a past history of large ponded basalt flows and inflated pahoehoe flows of a ca. 400 m aggregate thickness. A group of highly enthusiastic geologists braved the world famous tides of the Bay of Fundy (55 ft), unpredictable spring weather and always threatening squalls for a three day excursion after the 2005 GAC-MAC meeting to observe, ponder and ponder some more the outcrops of NMB from Parrsboro to Digby. We describe below the salient aspects of this trip. The full details are available in the field guide (Field Trip B3) and for any that are planning a trip, we would be most willing to offer advice and assist in any way possible. For those planning a trip, remember, tide tables are an essential part of the planning and most coastal exposures are only accessible at low tide!

We left Halifax later than expected and not with the vehicles that we had expected.....it's a good story and a learning experience, but the important thing is that we eventually left with all the participants! The trip 17 registrants, three leaders and a few other interested parties from industry, government and academia, and they came from all over the continent plus one from Europe and another from India! In addition, the trip was unique in that three husband-wife pairs participated, which provided an unexpected and much enjoyed flavour. In addition, there was a wide range in volcanological and petrological expertise among the participants, which collectively contributed to a highly successful field trip. The Parrsboro coastline is worth a visit for the scenery alone - unfortunately, the dark clouds, low ceiling and drizzle on Day 1 did not contribute to this aspect as we departed our lodgings.

However, the exceptional exposures of layered mafic pegmatites at the McKay Head section (Greenough and Dostal, 1992a, b) is a must stop for any keen igneous petrologists and this was the draw for day 1. On the way to McKay Head we passed by one of the world's most famous localities for early dinosaur fossils at Wassons Bluff, but time and tides were foes, not allies on the first day, and so such geological wonders had to await for another field trip.

Day two began from Wolfville, home of Acadia University and situated at the easterly end of the picturesque Annapolis Valley. At this point the lower flow unit of the NMB forms a prominent, ca. 150 m wall defining the south side of the North Mountain, a prominent topographic feature forming the north side of the Annapolis Valley.

The day began with a stop at the top of the Lower Flow Unit (LFU), but unfortunately RDF (rain, drizzle, fog) interfered with what is normally a spectacular view of the valley and Minas Basin to the west. During the morning the entire section of the NMB was visited, where the LFU, MFU and UFU can be seen in close proximity and the features of these units contrasted.

The final day of the trip was under blue skies and sunshine as was spent in the Digby area, at the west end of the Annapolis Valley. This location again allows one to see the three flow units in close proximity. In addition, past quarrying activities at two localities in the LFU exposed some exceptional exposures of mafic pegmatites.

What could one do to top of such a great trip - one in which everything went right, or as well as one could hope. Well, thanks to kindness of for former University of Toronto geology professor John Rucklidge and his wife we had the perfect ending. They hosted twenty plus hungry and boisterous geologists for an afternoon of fabulous homemade food and beverages at their remodelled 19th century farmhouse nestled along the Annapolis River and surrounded by lovely gardens. It was an excellent way to end a fabulous outing to the NMB, one that the leaders had been looking forward to for some time.

Now for those that want to know the true story of why CAA had to show up and rescue us in the later afternoon and prevent a potentially untimely and unforseen disaster at the end of the trip that had gone so well, you will have to corner one of the leaders or participants at an appropriate venue, provide appropriate beverage and listen.....

REPORT FROM HALIFAX: STUDENT ACTIVITIES
By Tony Barresi

Greetings fellow volcanologists and igneous petrologists! My name is Tony Barresi; at the 2005 GAC-MAC conference I was elected to the position of student representative for the Igneous Petrology and Volcanology Division of the Geological Association of Canada. As a newcomer to the field I am proud to see that students across Canada are pursuing interesting and innovative research. I would like to introduce myself by describing my research; and to help demonstrate the health of "hard-rock geology" in Canada, I'll also take this opportunity to describe some of the dynamic projects which my fellow students in Halifax, NS are pursuing. Furthermore, I would like to invite other student members of the division to consider submitting, to this newsletter, summaries of the research that they and their fellow students are pursuing. I am enthusiastic to hear about other students' research and I am certain that many of our more experienced colleagues would like to know what the young minds of today are discovering.

First however, I must fulfill my roll as the student representative to the VIP division. As the student representative I would like to be able to publicize anything which is of interest to other students. I would also like to advocate a student perspective within the division. So, if anyone has any resources, events, questions or concerns which they wish to have addressed, publicized or otherwise considered please contact me (see the VIP website for contact information).

I am a student of Dr. Jarda Dostal who supervises students at both Saint Mary's and Dalhousie Universities. Dr. Dostal is also the supervisor of three other graduate students. I am studying the physical and chemical characteristics of the Middle Jurassic upper Hazelton Group in northwest BC (photo on left). This group of mainly volcanic rocks is among the youngest deposited within the Stikine Terrane. They represent a dynamic stage in the evolution of the terrane during which subduction related volcanism ended and extension related volcanism dominated. Of particular interest in these rocks is the presence of a number of economic mineral occurrences, including the world-class Eskay Creek Ag and Au VMS deposit. My research incorporates fieldwork that constrains the structure of the "Eskay Belt" as well as the morphology of the volcanic environment. In addition, I aim to use major and trace element, as well as isotope geochemistry to determine the nature of volcanism in this dynamic belt and to better understand its relationship to the associated mineral occurrences.

Ahmed Ahmed is developing a detailed geological and structural model for the occurrence of newly discovered porphyry-hosted and epithermal-vein type Au-Cu mineralization in southeastern Mongolia (Photo at left). He is studying the Tsagrig prospect that occurs within

the Ongon region and is located along the inferred northeastern extension of the South Gobi Porphyry Belt which hosts a number of impressive mineral deposits. Ahmed aims to assess the mineral resource potential of the area, produce a detailed geological map, and to characterize the tectonic setting and the petrology of the igneous rocks in the area. The research will include detailed field and petrographic observations, as well as major and trace element and isotope geochemistry. Ultimately Ahmed hopes to propose a model for the porphyry and epithermal-type Au-Cu mineralization at Tsagrig.

Alberto Orozco-Garza is conducting research on a swarm of lamprophyre dykes in Sonora, northwestern Mexico. The lamprophyre dikes in this region were emplaced during a Mid-Tertiary transitional tectono-magmatic stage when subduction of the Farallon plate beneath northwestern Mexico coexisted with the initial stage of extension of the Basin-and-Range Province and the formation of the southernmost core complexes of North America. Alberto hopes to map and date the dyke swarm, describe their whole-rock geochemistry to constrain their petrogenesis, and ultimately to evaluate the tectonic environment of their emplacement. The significance of Alberto's study extends to understanding the transition from compressional to extensional tectonics, and the general process of lamprophyre generation in these settings.

James S-Momoh, also a student of Dr. Dostal, is studying the Stoughton-Roquemaure Group in the Northern Volcanic Zone of the Abitbi greenstone belt in Quebec. This group is mainly composed of komatiites, komatiitic basalts and tholeiitic basalts. These rocks as well as the underlying Hunter Mine Group have geochemical characteristics that are thought to represent an evolution in magma genesis from crustal melting (rhyolites) and arc rifting to melting of a mantle plume. James is discriminating these changes through the use of mineral chemistry. In particular he will employ laser ablation ICP-MS to determine the trace element concentrations of relic clinopyroxenes. He will develop a technique by which this method can be used to constrain the origin of these, and similar rocks.

Dr. Georgia Pe-Piper, who is a professor at Saint Mary's University, is supervising the research of Nikolaos Tsoukalas. Nikolaos is studying the geodynamic evolution of the late Miocene igneous rocks on the island of Kos at the southeastern edge of the active Hellenic volcanic arc. Nikolaos is focusing on the petrology and structure of these rocks (Photo at left). For instance, Nikolaos will be using geobarometry to determine the intrusion depth of the Dikaios Monzonite which shows evidence of syn-magmatic or earlier deformation at its margins. Nikolaos is also conducting fieldwork to determine important stratigraphic and flow direction relationships which will help to delineate the boundaries and determine the physical nature and setting of a large caldera structure located in the study area. Ultimately Nikolaos will reconstruct the geodynamic evolution of the late Miocene igneous rocks in the region.

Dr. Barrie Clarke, a professor at Dalhousie University is supervising the research of Saskia Erdmann. Saskia is using the South Mountain Batholith and Tuolomne Intrusive Suite as case studies in her investigation of the contamination of granites by country-rock material. She

is employing a wide range of textural, chemical and mineralogical studies to help solve this difficult problem. An important part of her research is to examine evidence of country-rock assimilation from the pluton to submicro-scales. When studied at different scales estimates of contamination are often quite contradictory, and by using many analytical techniques and examining these rocks on all scales Saskia hopes she will resolve this paradox. In addition to traditional petrographic and chemical analyses, Saskia will be conducting thermal stress fracturing and melting experiments to characterize the rates of xenolith disintegration through time and to constrain the variables that affect that disintegration.

Many thanks to those who contributed to this issue of Ashfall! This is the newsletter of the VIP Division, NOT the Editor, so if you have news about an upcoming conference, field trip, or goings-on at your university, company, or government office, let me know – the rest of the volcanology and igneous petrology world is probably interested, too!

Brian Cousens
Editor, Ashfall
Secretary-Treasurer, VIP Division

GO SEE THE WEBSITE!!!!!

http://gac.esd.mun.ca/VIP/