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

#48

Minutes of the Annual Meeting
June 1 2000,
Evans Room Rosca Building, University of Calgary

Present Georgia Pe-Piper (Chair), Michael J. Harris, Richard Ernst, Brendan Murphy, Jonah Resnick, Don Francis, David J.W. Piper, Cathie Hickson, Mavis Stout,
Jim Nicholls, Michael Higgins, Mike Hamilton, Alexei Poustovetov, Peter Roeder, Kelly Russell, Ben Edwards, Jarda Dostal, John Greenough, E.H. Chown (Secretary).

1) The meeting was called to order at 12:06.
2) The proposed agenda was adopted, moved C. Hickson, seconded D. Piper.
3) The minutes of the 1999 annual meeting, duly published in Ashfall # 48, were adopted, moved D. Piper, seconded P. Roeder.
4) There was no business arising from the minutes.
5)The report of the chair, presented by G. Pe-Piper is printed below in this issue of Ashfall.
6) The Secretary-Treasurer presented the financial statement for 1999, published in Ashfall # 50. C. Hickson moved, D. Francis seconded the approval of the financial statement, Carried.
Some discussion followed on the modalities of reducing expenses. It was agreed to experiment with two versions of Ashfall, a printed version for those who prefer it, and an electronic version with hyperlinks to our website and to appropriate websites cited in the printed Ashfall. Initially the electronic version will be sent to student members, and the printed version to dues-paying members, who will then be asked to opt for the electronic version if they so desire. Some members expressed a clear preference for the printed version, and the secretary noted that some members, not present, do not indicate an electronic address, and some are known not to have one. Future expenses related to the restriking of the Career Achievement medal whose supply is running out (2 left) must be budgeted for. C Hickson urged the executive to apply to the Canadian Geological Foundation in advance for relevant funding, as this body only meets once a year.
7) Scheduled Activities

- St, John's 2001 - the Division is sponsoring a special session "Modern and ancient oceanic ridge processes" with a related field trip to the Betts Cove ophiolite (co-ordinator Jean Bédard). We area also co-sponsoring with IGCP 426 a special session "Magmatic systems and Proterozoic lithospheric processes) (co-ordinators Sandra Barr and David Corrigan).
- Saskatoon 2002 J. Stix is proposing a session on "Facies analysis and architecture of modern and ancient sequences". No advance has been made on the onepday field trip to the Leckie? kimberlite suggested by R. Baragar at last year's meeting. The possibility of a Yellowstone field trip was mentioned, but it was questioned if the park would be fully open at that time.
- Vancouver 2003 (C. Hickson, general chair) Cenozoic Cordilleran Magmatism appeared to meet with general favour as a possible theme (Russell, Nicholls , Francis, Edwards). possible field trips included 3-day trip to Mts Baker, Rainier and St Helens; a two day trip to Mt. Meager, and a one-day trip to the Squamish area.

- C. Hickson noted that Council was anxious to promote Short Courses in conjunction with annual meetings

8) VIP special series in Geoscience Canada

Volcanic History in Canada	C. Hickson and R. Baragar
Quaternary volcanism in Canada	C. Hickson
Ocean Island volcanism	J. Dostal and J. Greenough
Recognizing mantle plumes in the geological record	R. Ernst
Pyroclastic facies	W. Mueller and J. White
Archean volcanism	P. Corcoran and W. Mueller
Iron formations in Precambrian volcanic successions	E.H.Chown
Application of isotopic methods to petrogenetic problems	B. Cousens
Oceanic Crust and Ophiolites	M. Harris
Rift-related large igneous provinces	G. Pe-Piper and D.J,.W. Piper
Precambrian anorthosites	M.D. Higgins
Calibrating time scales of magmatic processes	M. Hamilton

The chair agreed to continue organizing the Geoscience Canada Series and to contact the editor.

9) Léopold Gélinas medal presentations.

The bronze medal for best Honours Bachelor's thesis was presented to Jonah Resnick (UBC) by Georgia Pe-Piper

The Gold medal for best PhD thesis was presented to Alexei Pousovetov by Peter Roeder.

10) Brendan Murphy read the citation for the Career Achievement Medal, presented to Ken Currie, who was unable to attend because of prior commitments. In his absence, the secretary read his acceptance speech.

(All citations are published elsewhere in Ashfall)

11) New Business:

- J.D. Greenough proposed a one-day field trip to the Avalon Volcanics. As it may be too late to add to the 2001 programme, it was agreed to see if it was possible to do it as an informal filed trip.
- The new G.A.C. field trip safety policy document was distributed to general consternation. P. Metcalfe (Councillor West) commented by mail. J. Nicholls (MAC representative on the Field Trip Safety Committee) explained that the intent was to improve field trip safety without making the procedure so heavy that no one would want to lead a trip? The chair asked individual members who had comments to forward them to Scott Swinden directly before July 1, 2000.
- The possibility of funds for keynote speakers for special sessions was discussed. M.D. Higgins observed that it was a great asset to session organisers, and that the funds provided by the Calgary Meeting had greatly facilitated the task of organising this year's special session. It was suggested that the Vice Chair and the organizers of the Saskatoon special session should investigate possibilities for funding: it may be necessary to submit proposals to funding bodies before the St. Johns meeting.
- International Volcanological Activities. J. Stix (by e-mail) observed that several international initiatives in Volcanology are now starting up and that it would be useful to discuss the place of Canadian volcanology/igneous etrology in the context of these and other initiatives. C. Hickson, as Canada's other representative on IAVCEI confirmed this. J.K. Russell commented on the EU-Canada co-operative programme involving graduate students exchange and student education. M.D.Higgins noted that there is a Nordic volcanological fund, but that Canada, although clearly Nordic, was not involved. D. Piper proposed an informal discussion in St. Johns on these and related issues.

12) The meeting adjourned at 13:30, Moved by D.J.W. Piper

ANNUAL REPORT OF THE CHAIR

Membership of the Division remains strong at about 200 members, of which about 25% are students, who pay no dues. There was a good turn-out for the annual general meeting of the Division in Calgary, with its traditional free lunch.

The Division's main activities are:

• the distribution of its newsletter, *Ashfall*, to all members three times a year. Our thanks are due to Ned Chown for his success in providing us with an informative and interesting newsletter. I encourage all members to submit material for *Ashfall* - tell your colleagues about your field work, new findings, work by students etc.

• sponsoring of special sessions at Annual Meetings. In Calgary, the session on "How do magmas solidify?" was a great success and we thank Michael Higgins and Tony Fowler for organising such as excellent set of talks. At the St John's 2001 meeting, the Division is sponsoring a special session "Modern and ancient oceanic ridge processes" with a related field trip to the Betts Cove ophiolite (coordinator Jean Bedard). We are also co-sponsoring with IGCP 426 a special session "Magmatic systems and Proterozoic lithospheric processes" (coordinators Sandra Barr and David Corrigan).

• the awarding of medals. At our annual general meeting in Calgary, we awarded the Gelinas gold and bronze medals for respectively the best Ph.D. and B.Sc. thesis in volcanology and igneous petrology. We also made the VIP Division Career Achievement Award. Details of our award winners will be found below in *Ashfall*.

Kelly Russell continues to maintain a web page on behalf of the Division. Information has been added to the web site on careers in volcanology and igneous petrology. A series in Geoscience Canada on igneous rock associations is planned for the coming years and many of our active members will be involved in this initiative.

I would like to see the tradition of a Division field trip re-established. If there is a volunteer out there who would be willing to organise an inexpensive overseas volcanological field trip, the Executive would like to hear from you! In the mean time, I have suggested that we could try to have an occasional informal regional field trip, that might attract mostly Division members living in that particular region. I will organise a 2-3 day field trip to volcanic rocks of Nova Scotia in the summer of 2001 if members living in the east would be interested.

I thank the current officers and council of the Division for their support over the year. All were elected to serve a two year term until 2001 and are therefore continuing their duties for the coming year. I would be glad to hear from any Division members who would like to suggest names for the Executive and Council to be elected at the St Johns meeting in 2001.
Georgia Pe-Piper
Chair VIP Division

The Léopold Gélinas Bronze Medal for the best volcanology/igneous petrology B.Sc. thesis is awarded this year to Jonah Resnick for his thesis entitled:

"Neogene magmatism from the northern Nechako River and Summit Lake map areas, British Columbia: Implications for the petrology of the lithosphere"

The thesis is a clear, concise, and scientifically valuable contribution to our understanding of the mantle and lithosphere beneath central British Columbia. The author demonstrates the alkaline nature of the basaltic volcanic rocks and distinguishes them from coeval rocks erupted to the south. He also documents the heterogeneity of lower crustal and mantle xenoliths contained in the basalts, providing evidence which suggests a thickening of the lithosphere in an eastward direction. His final conclusion is that the mantle source region for these rocks is heterogeneous, based on their physical character, their chemistry, and melting models.

In summary, this thesis is an impressive piece of work which addresses important petrological problems using modern techniques and concepts. We take this opportunity in congratulating Jonah for his award and wish him the best in his future endeavours.
John Stix
For photograph visit <http://perseus.geology.ubc.ca /~russell /GAC_volc/>

Citation for Alexei Poustovetov

It gives me great pleasure to nominate Alexei Poustovetov as the year 2000 recipient of the Leopold Gelinas Gold Medal of the Volcanology and Igneous Petrology Division of the Geological Association of Canada. In his Ph.D. thesis at Queen's University, Alexei developed a set of equations which relate the composition of basaltic melt to the composition of the minerals olivine and chromite. These equations take into consideration the compositional and ordering complexities of chromite and use the experiments of a number of workers to model the chromite-melt equilibria. Alexei uses these equations to calculate for a number of basaltic lavas the oxygen fugacity, temperature and composition of chromite at the time of extrusion. These results compare favourably with those determined by independent methods. Alexei is one of those rare scientists who feels equally at home mapping the Kempersei Ophiolite in Kazackstan, conducting electron-microprobe analyses of olivine and chromite and using complex numerical methods to model chemical equilibria. He has demonstrated using thermodynamics, numerical methods and electron microprobe analyses

how we can better understand the pre-eruption conditions of basaltic lavas and thus he is a very worthy recipient of the Leopold Gelinas Gold Medal.

Peter Roeder

For photograph visit <http://perseus.geology.ubc.ca /~russell /GAC_volc/>

Career Achievement Medal

It is a pleasure to nominate Dr. Ken Currie for the Career Achievement Award of the Volcanology and Igneous Petrology section of the Geological Association of Canada. Ken's research career of more than 40 years is laced with scientific creativity and innovation in an impressively wide range of petrological processes and an uncommon ability to integrate field work with petrology. For much of this time, his work has focused on Experimental Petrology (including solubility and immiscibility studies), Alkaline Rocks of Canada, and Granitoid Rocks of the Appalachians. In the early 1960's, Ken was one of the first petrologists to draw our attention to the significance of variations in Hf/Zr ratios in granitic rocks and in high grade metamorphic rocks, many years ahead of the vast volume of literature that ultimately related these parameters to granite classification schemes and tectonic setting. About the same time, mapping in New Quebec provided a detailed study of ancient craters and the proposal that analogues of lunar craters occur in the Canadian shield. His laboratory experiments produced ground-breaking documentation of the behaviour of albite in supercritical water in the Na-Al-Si-F-H2O, system. In the late 1960's, his interest in alkaline mafic and ultramafic rocks resulted in the research into coeval igneous petrological processes, genetically related metasomatism, and the potential relationship between these events and meteorite impacts. Continuing experimental studies in the late 60's and early 70's provided significant contributions, including: (1) re-establishing liquid immiscibility as a significant petrologic process; (2) documenting close links between metasomatism (fenitisation), deformation and metamorphism in alkaline rocks; (3) cordierite and sapphirine for geothermobarometry; and (4) peralkaline to peraluminous compositions.

In the early to mid 1970's Ken became a world authority in the various manifestations of alkaline rocks, and in 1976, the landmark "The Alkaline Rocks of Canada" was published. In the late 1970's, Ken began mapping in various parts of the Canadian Appalachians, especially in southern New Brunswick, Cape Breton Island and northeastern, central and south-central Newfoundland. Over the next 20 years, he published extensively on Appalachian geology on a wide variety of topics including stratigraphy and tectonics, and granite petrogenesis. He became an expert on the relationship between granite petrology and tectonic setting. During this productive period, several publications stand out. In 1981, he published a key paper on the genetic relationship between some Appalachian granites and crustal anatexis, and in 1984 (along with Joe Whalen) produced one of the first (and still one of the best documented) cases for the role of magma mixing in the evolution of plutonic complexes. In the late 1980's, along with Joe Whalen and Bruce Chapell, Ken was one of the first petrologists to recognize the importance of A-type granites, and their tectonic setting. The Topsails Complex of Newfoundland played a key role in that research and is an example of Ken's ability to integrate field observations, textural and geochemical data to help develop a petrogenetic model.

About this time, his interest in alkaline rocks and related carbonatite complexes also resulted in several publications, one that stands out (in my view) is his study (with Eby and Gittins) of the Mont St. Hilaire Complex of Quebec where an innovative model proposes that interaction between silica undersaturated syenite magma and saline brines could produce sodalite-bearing syenites.

In the late 1980's and early to mid 1990's, Ken's research into the relationship between regional styles of magmatism and tectonic setting in the Appalachians produced several key papers including the potential of early Silurian magmatic "overstep" sequences in the Appalachians and the ramifications for the closure of Iapetus. We now know that the basic message in these papers, that the main part of Iapetus was closed prior to the Silurian was indeed correct, but this paper was well ahead of its time. Ken also published a number of papers that provide insights into the relationship between igneous activity and tectonic setting in the Neoproterozoic and Paleozoic rocks of southern New Brunswick. These results provide important constraints for paleocontinental reconstructions during an important period of Appalachian tectonics.

And so 40+ years after Ken embarked on his research career, his publications in the late 1990's include provocative papers on his beloved alkaline rock suites in Newfoundland, Ontario and Quebec, tectonic models for southern New Brunswick, a new methodology for amphibole classification, geothermobarometry in blueschist and greenschist terranes and the evolution of peraluminous plutons in southern Nova Scotia!

Ken's research has been innovative with a level of sustained excellence for over 40 years. The breadth and depth of his contributions span some of the most fundamental concepts in the field of igneous petrology. Ken tackled some of the most important petrological challenges of our time and consistently provided novel and plausible insights into fundamental processes responsible for them.

He was always well ahead of the pack throughout his career and is a most deserving recipient of the Career Achievement Award of the Volcanology and Igneous Petrology section of the Geological Association of Canada.

Brendan Murphy

For photograph visit <http://perseus.geology.ubc.ca /~russell /GAC_volc/>

Acceptance speech for Career Achievement Award,
Volcanology and Igneous Petrology Section

in praise of solos, serendipity and irrelevance

Ladies and gentlemen, honoured colleagues, friends: I am deeply touched and gratified by this award. It was both unsolicited and unexpected, since few of my peers would consider me either a volcanologist or an igneous petrologist.. I offer special thanks to the friends and colleagues who nominated me, Brendan Murphy, Joe Whalen and Cees van Staal, not only for their confidence in me, but also for their ingenuity in preparing a suitable citation for a 'battered old field geologist with bad knees' as Hank Williams once called me. I regret that I am unable to be present to accept the award, but Brendan will surely deliver my remarks with his usual panache, and thereby pay off a debt of a considerable number of pints of beer.

A career achievement award invites a contemplation of the career. As I look back, my career has been marked by numerous changes in direction, to subjects in which I had no obvious previous competence, but in which I became interested by chance or serendipity. Able and stimulating collaborators have helped me in all my projects, but I have pursued those projects essentially by myself. Economic relevance has never been a major factor in my research, although significant economic activity has flowed from several of my results. In brief, my career has been solo, serendipitous, and irrelevant. All of these characteristics are presently considered politically incorrect by those who administer and fund science. If my career has been of scientific and economic value, I hope that it will promote the message that comprehensive planning, team building and economic relevance are not the only, or even the best, criteria for identifying significant research.

Let me begin with relevance. 45 years ago my work was highly relevant, searching for iron ore and base metals in the Labrador Trough. My colleagues and I were so successful that in 1958, my employer decided that they had sufficient ore reserves, terminated the exploration staff, and withdrew permission for me to use material which I had gathered in their employ as a basis for a Ph.D. thesis at the University of Chicago. I learned that relevance is a very ephemeral concept. Mining companies know this. Throughout my career at the Geological Survey they have encouraged systematic mapping of areas irrelevant to their immediate economic interests. The wisdom of this course has been made clear to me by recent inquiries about areas which I mapped 30 years ago, and which are now of economic interest. Of course economic relevance has major political significance. If you are contemplating a project in the Shawinigan region, I earnestly advise you to try for funding in the next couple of years, although you may have already missed your window of opportunity. As scientists, we make our living by rationalisation, compelling data to fit some framework, dreamed up by us or cribbed from a colleague. If we cannot rationalise why our particular interest fits some particular political priority, we don't deserve to be funded. If you think that this sounds unduly cynical, remember that I have lived through the plate tectonic revolution, the computer revolution, the chemical analysis revolution and several other upsets in the way geology is done and reported. I am, therefore, profoundly aware of how our scientific arguments are shaped by the scientific and cultural climate around us. In my own case, I financed my research for nearly 20 years from federal-provincial mineral development agreements without developing a single mineral, so to speak. I am proud of my record. When the final assessment of these programs is made, the regional maps which I made and caused to be made will be one of the few lasting legacies, even though it took considerable rationalisation to fit them into the mandate. I suspect that with megaprojects. such as LITHOPROBE, the same assessment will apply - the most valuable results will be those remote from the central thrust of the program. To sum up, I am entirely in favour of relevance in scientific research - as long as it is relevant to the researcher, and not just to his scientific and political masters.

Horace Walpole coined the word serendipity for discoveries made by accident while searching for something else. To quote only two examples, Columbus discovered America when he was looking for India, and Post-It notes were an unintentional by product of a failed search for a better glue. Despite the high proportion of great discoveries made by serendipity, it arouses suspicion among those who fund and administer sciences. If we compare ourselves (justly in my opinion) to the blind men characterising an elephant by touch, many administrators doubt that a researcher working on the trunk of the elephant is really competent to explore the shoulder, accidentally touched during his investigation. I have no such doubts. I wrote my Ph.D. thesis under the supervision of Hans Ramberg, then entering his fourth career change. He had made his reputation

as meticulous field geologist of legendary endurance and resilience. As a result of his observations, he became interested in metamorphic petrology, then a little developed area, taught himself thermodynamics, and wrote a brilliant and innovative book which still repays study. Since thermodynamic data were so sparse, he established an experimental lab for solution calorimetry, one of the first in the world. At the time I studied under him, he had become interested in boudins, and was teaching himself elasticity and plasticity theory in order to understand the relations of these elements during deformation. His contributions to this subject, summarised in another seminal book, are still quoted with admiration. Ramberg taught me that the best theory flows from accurate field mapping, and that problems suggested by mapping can be attacked by making oneself expert in the relevant theory, even when it is far removed from one's original specialty. My own career has embraced regional geological mapping, studies of craters, petrology of alkaline rocks, experimental petrology, and studies of granitic rocks in the Appalachians. There are serendipitous connections among all these diverse fields which it would take too long to explore in detail. The point which I wish to make is that I had the freedom to explore these fields and, I am vain enough to think, make contributions to all of them. I am deeply grateful to the Geological Survey for giving me that freedom, and I hope that those who follow after me will have the same opportunities.

Over the course of my career I have fruitfully collaborated with many colleagues, including the three friends who nominated me for this award. These collaborations were based upon converging interests in a particular subject which we explored to the limits of our ability and imagination, and then moved on in separate directions. I have also, during the course of a long career, been drafted into four megaprojects in which I had little personal interest. Three of them were abject failures in terms of quality and quantity of scientific output relative to talent and money invested. The fourth was, at best, a partial success. There are very good reasons why large group research produces less innovation than individual or small group research. Ideas are individual, not collective. Many ideas are developed and improved by a committee, but none are collectively conceived. Most administrators and some scientists seem to feel that sheer weight of numbers, a 'critical mass', will automatically produce innovative science. I think the best comment on this concept came from the 20 to 30 collaborators on the Apollo lunar program who signed themselves the 'Lunatic Asylum'. Participants in a large project feel committed to it only to the extent that it reflects their individual interests. When none of the participants is entirely devoted to a large project, it simply dies because no one participant is committed enough to drive it forward. Megaprojects are also, by definition, extremely expensive, more expensive than funding the participating individuals at modest levels. After all, that is the point of a consortium, to extract more funding than could be obtained by individuals. I am not opposed to collaboration in science. I would not be here without help of my collaborators, both my coauthors and the multitude of indispensable technical support staff. Despite my predilection for serendipity, no scientist today can be expert in all areas of science relevant to their interests. However, after all the benefits of collaboration have been cited, there still remains, in my opinion, an indispensable solo element in science.

These ideas of curiosity based research, the importance of serendipity and individual initiative, central to what has been called the 'republic of science', are not currently popular among funders and administrators. We republicans were accused by an unlamented former superior of 'playing in the sandbox of science'. I cheerfully plead guilty, standing with Isaac Newton, a savvy political operator it may be noted, who described his research as picking up pebbles on the shore of the sea of knowledge. In my view, research of this kind not only serves the advancement of science, but also the benefit of humankind in general. To those who disagree, I close with the words of Oliver Cromwell to another recalcitrant granting agency, the Long Parliament; "In the bowels of Christ, I pray you to consider that you may be mistaken".

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The Division executive is up for renewal this year. The Chair moves on to past chair, and vice Chair becomes Chair in order to insure continuity. Thus we need a new vice Chair, who will move up the ladder in two years. We also need a new Secretary-Treasurer, as the present one is getting long in the tooth, and has served five years. The post is not very time-consuming, except when it comes time to produce a Newsletter (three times a year at the present rate). The banking aspect of the job is relatively simple. We call for volunteers and suggestions now, but we (the present executive) will be twisting arms in the new year.

The four councillors are eligible for renewal, although two (Western and Central) have already served two terms, and the student councillor should normally be renewed every two years. The councillors are the proving ground for future chairs. One additional task that the western councillor has performed (admirably) is the job of contact with Pressed Metal Products, who make and store our medals and engrave them for each award.