ASH FALL

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

#38 **September, 1995**

MESSAGE FROM THE CHAIRMAN

I am presently chair of the Cordilleran Section of GSA and in writing the message for the annual newsletter I realized that the issues I tried to address there are, I think, appropriate for readers of Ash Fall. I hope you will indulge me by allowing me to use the same words for both groups.

I thought I would use this space to present a philosophical view of management, scientists, and the making of maps. The three items may not hold together from your perspective, but from mine there is linkage. Most of us live and work in [Canada], one of the most mappable areas on earth. Many of you make maps — perhaps more than realize it right now, but read on.

Some of you know, that April 1, I landed headfirst in administration in an office in the midst of turmoil. Part of this turmoil was unique to this office, but much was, and still is, the result of tumultuous times. Government cutbacks to geoscience surveys have not been limited to the US. Here in Canada the cutbacks to the 153-year-old institution of the Geological Survey of Canada amount to nearly 30%. Senior management has recently amalgamated us with another group, Geomatics Canada, into the "Earth Science Sector." Both events have left staff reeling and uncertain of the future.

We are not in a phase of doing more with less, cutting corners and trying to manage — we cannot continue to do all that we have done in the past. Managers are trying to figure out what constitutes the "less." Within this climate of cutbacks and reorganization I see some of what we (the GSC) have viewed as our fundamental role being eroded. This is erosion of support for basic geologic mapping. I shudder even to use the word "basic" mapping. In some circles it seems that mapping has come to mean old fashioned, outdated, something that is in the sunset of its usefulness. A parallel view that is perhaps just as damaging is the perception that once mapped an area need never be visited again. To address these perceptions, I put together a presentation that explored why and how we map. I would like to share a few of these thoughts with you.

The presentation I gave was entitled *Geoscapes: Landscapes in a new age of scientific discovery.* I have borrowed from the book by Stephen S. Hall called *Mapping the next Millennium: The discovery of new geographies* (1991, Random House Inc.) "Geoscape" is a word coined in this office as a contraction for "geological landscape" used to describe a series of maps that include geological information from the environmental, hazard and resource fields. I would like to define

a "geoscape" differently — as a four dimensional image that integrates topography, geology, geophysics and time. For the same reason "geoscape" was coined to avoid the historical baggage associated with the words "environmental" "hazard" and "resource", I would use it to describe new, integrated, computer-assisted, versions of basic geological and geophysical maps.

This is something new. The geoscape is the visual expression of multidisciplinary, multi-functional, multifaceted "dream teams". The geoscape is the next generation of map that builds upon the knowledge and expertise of many individuals. There are not many "true" geoscapes around yet, but as we become more integrated (working as teams of experts) and computerized, traditional map products should frequently become "geoscapes".

What is interesting about mapping is that we all do it. Maps are simply data presented as images. In fact virtually every scientific discipline maps! Every discipline that is, that seeks to understand information in a spatial way. Maps, whether they are of genes on a chromosome or images of mathematical expressions, give data "geographic" expression within calibrated space. Geologic maps have the added dimension of time.

Psychologists would argue that maps are useful ways to present data because we (human beings) think in images. They suggest that we store information in the brain as images and as such, information that is already in image form is much more readily retained than that presented in tabular form. They will also tell you that the brain is a wonderful instrument for identifying patterns, of being able to pick regularity out of chaos (as anyone who has worked with seismic profiles will attest!). In fact the brain is much better than any computer at doing such things that require fuzzy logic integration. Better yet, the brain can interpret those patterns and ask questions.

Geoscapes are tools that answer temporal and spatial questions. Map making is taking data points; measurements, observations, sample information and transforming them into images. We fundamentally map ***with*** our minds, converting data into images through knowledge and experience. These images present layers of information and relationships in a way that is understandable ***to*** the mind. Transformation of data into images is a skill that develops over a lifetime and must be cultivated and nurtured. Where will the next generation of mappers come from and who will train them?

What questions and problems can be answered by a map? Obviously this depends on the type of image, map or geoscape. Yet even then, we do not know all the questions that our maps can answer. We do not know all the problems they can solve. A new set of eyes sees new patterns and a different set of experiences recognizes different relationships. A different question sees new patterns and a new pattern raises new questions.

This inability to predict the usefulness of any particular map commonly leads to unconvincing cost:benefit studies, which in turn lead to loss of prestige and support for basic geoscience mapping. Ultimately this will lead to significant gaps in understanding and inability to answer new questions or solve new problems. There will be no ground truthing for satellite borne images or other remotely sensed data. Geologists probably cannot substantiate the geophysical understanding of the third dimension. We may not have the appropriate information for the next strategic commodity or cannot help further exploration following the next great mineral discovery. And what of the next environmental pathogen? Will we have the information we need to address societal needs?

Maps are anything but old fashioned. People are starting to figure out that the location of granite bodies high in uranium might have something to do with radon concentrations. Stream chemistry that affects aquatic life may just be influenced by underlying bedrock. These days Geographical information systems help us manipulate data, ask questions and get answers, rapidly

and efficiently. The patterns recognized by the eye can lead to new questions, new problems, new interpretations. Computers can help us design and create derivative maps that will raise new questions. A map or geoscape has so much information — so much information waiting to solve the next generation of problems.

Maps are not a sunset activity any more than mining is. The society that thinks it can do without maps is no more short sighted than the one that thinks it can do without mineral resources. Maps evolve with our understanding and our understanding evolves with maps. Their usefulness is only limited by the questions we think of asking. Can we afford, as a society, not to have the maps or the people with which to answer some of these questions?

Cathie Hickson

EDITOR'S CORNER

This Ash Fall is getting to you a tad late. It will be followed shortly by Number 39, in a desperate attempt to keep up with the new material on Ruapehu - I'm compiling this material now. There were, however a couple of newsy points I wanted to dwell on in this Ash Fall, long overdue.

The first, of course, are our medal winners. The medals were awarded at the Division's working luncheon and AGM, a fashion which seems to be both popular and fairly cheap to run. Our congratulations go to **Steinunn Hauksdottir, Hélène Gaonac'h and Jack Souther**, our deserving medal recipients for 1995. Their citations (and thesis titles where appropriate) are given below.

We had a good showing for both field trips at the GAC/MAC; I'll refrain from singing their praises because Cathie and I were leading the trips. I would like feedback from at least one of the troops who were on either field trip, plus any field trip photographs. In short, write something!

In July of this year, I was lucky enough to be able to go to Boulder, Colorado to attend the IUGG meeting. I was a little taken aback at the scale of the meeting (I'm just a country boy), and thoroughly impressed with the venue - the University of Colorado campus with its beautiful buildings, based on local (sand)stone. Colorado just became my favourite state.

Besides its aesthetic value, the University of Colorado is noteworthy for a landmark decision, made by the representatives of member countries, to change to individual membership basis for the International Association for Volcanology and the Chemistry of the Earth's Interior (IAVCEI). National volcanological organizations will probably oversee the ensuing membership drive. Last I heard, they were discussing membership fees. More on this item in #39.

Which brings us to ***our*** elections next spring. As some of you know, at the beginning of this calendar year, I was offered and undertook, the position of GEOLOG editor. You may also know that my second term as Secretary-Treasurer of this Division ends this coming May, as does Cathie's tenure as Chairman. While I am not abandoning ship, some extra time would be a help.

In short, is anyone interested in taking on the job? Volcano listserv does a handy job of bringing in all the information for Ash Fall, ready to collate - the rest is just formatting. I would suggest that anyone interested have access to and a basic familiarity with the net. Finances have a fairly low turnover and do not occupy a great deal of time. Minutes of annual meetings, medal engraving and annual meetings are about the only other responsibilities. Think about it and contact me if interested. Y'all know where to find me.

Paul Metcalfe; pmetcalfe@gsc.emr.ca

LEOPOLD GELINAS SILVER MEDALLIST - STEINUNN HAUKSDÓTTIR M.Sc.

Thesis title: ***Petrography, geochemistry and petrogenesis of the Iskut-Unuk Rivers volcanic centres, northwestern British Columbia***

Steinunn's contribution to our understanding of volcanological and petrological problems is her innovative use of Nomarski imaging and phenocryst chemistry to answer problems of magma origin and contamination.

LEOPOLD GELINAS GOLD MEDALLIST- HÉLÈNE GAONAC'H Ph.D.

Thesis title: ***L'hétérogénéité de la morphologie et de la rhéologie des laves: scaling et fractales***

Hélène's thesis will have long term impact on how we deal quantitatively with many aspects of volcanological problems. From such seemingly disparate areas as accurately calculating the volume of lava flows to our ability to use remotely sensed data for volcanic monitoring. Hélène's use of scaling effects and fractal analysis provides insight and answers to these problems. John Stix accepted the Leopold Gelinas Gold Medal for PhD thesis on Hélène's behalf.

1995 CAREER ACHIEVEMENT MEDALLIST - JACK SOUTHER

Dr. Jack Gordon Souther began his career in geology as a horse packer and guide in the Rockies of Southern Alberta. He became fascinated by the rocks around him. Finishing high school by correspondence, he went to UBC finishing his degree in Geological Engineering in 1952. Curiosity of the natural world soon led him on to a PhD from Princeton University in 1956. Working for the Geological Survey of Canada as a student, then research scientist he first mapped the Terrace area. This map sheet contains many young volcanic centres and is just south of one of the largest and most fascinating volcanic complexes in western Canada - Mt. Edziza. Jack's career in Regional Geology continued. 1955 saw him crossing Axel Heiberg Island in operation Franklin. But volcanoes weren't far from his mind. In the early 1970's survey geologists were asked if they would like to specialize. Jack had already been thinking tectonically and volcanologically since the mid 60's. Jack chose volcanology and it was off to Japan for a year to study at the University of Hokkaido, Japan with Professor Kenzo Yagi.

Since the mid 60's Jack has been defining volcanism in Canada. His 1977 paper "volcanic regimes of western Canada" was a land mark paper that put the scattered and disparate volcanic centres in BC and Yukon into their tectonic niche. In addition to Jack's regional vision he focused on increasing our information and understanding of many individual volcanic areas - most significant of these is his monumental work of Mount Edziza published in 1992 just before his retirement in 1990. Retirement has not kept Jack from pursuing his love for volcanoes - albeit he does get more time to pursue his other love skiing A bulletin on the Ilgachuz Range in central British Columbia is about to be published.

Jack has built the foundation of our understanding of volcanism in western Canada - it is upon this foundation that all of us who work in the Cordillera build. Jack's work is a legacy for which he can be justly proud and it is this legacy that the Division honours in presenting Jack with 1995 Medal for Career Achievement - Congratulations Jack.

ANNUAL MEETING OF THE VOLCANOLOGY DIVISION; GAC
May 19th, 1995
Minutes

Attending: C.J. Hickson, Chairman; J. Stix, Councillor East; W.R.A. Baragar; E.H. Chown; B.N. Church; L Corriveau; D.B. Dingwell; J. Dostal; B. Edwards; T. Hamilton; S. Hauksdottir; J. Mungall; M. Parsons; T.H. Pearce; G. Pe-Piper; D.J.W. Piper; J.K. Russell; J.G. Souther; M.F. Taner; P. Metcalfe, Secretary-Treasurer.

1. The **meeting was called to order** by C. Hickson at 12.20 noon, Friday May 19th, 1995 in room Cornett A221 at the University of Victoria, British Columbia. The late start was due to the delayed arrival of the Secretary-Treasurer.

2. Agenda for the meeting was presented by the Chairman and approved as presented (Moved W.R.A. Baragar, 2nd T.H. Pearce)

3. Minutes of the previous annual meeting were distributed and approved as presented. (Moved W.R.A. Baragar, 2nd T.H. Pearce)

4. Business arising from the minutes There was no business arising from the previous minutes.

5. Report of the chairman was summarized by the Chairman

6. Report of the Secretary-Treasurer was presented and accepted (Moved G. Pe-Piper, 2nd T.H. Pearce). The division has 108 members as of April 8th, up from a membership of 101 at the same point in 1994. The Secretary-Treasurer noted that 23 members did not renew their membership, this was more than offset by the addition of 31 new members. The Secretary-Treasurer added that intensive advertising had not been pursued, asking if there were any opposing views on this subject. The membership flux was noted by several members and its general conformity to the total membership in GAC.

J.K. Russell proposed that Ash Fall be made available to members via E-mail; the Secretary-Treasurer noted that a large proportion of members did not have net access. J.K. Russell suggested that the newsletter be made available via E-mail, on request; the Secretary-Treasurer, while agreeing in principle, noted that the GSC network gateway in Ottawa has a habit of mangling appended files, particularly those in word processed format and recommended that this be done only when facilities exist. J.K. Russell also proposed advertising through a Division home page on the World Wide Web; this received general approval.

Division funds are $4031.90 in the black, of which $130.00 is committed for production of Ash Fall #37 The Secretary Treasurer noted that there had been production of only two copies of Ash Fall in 1994-95 and committed to production of 4 issues in 1995-1996, to redress the balance. Production costs of Ash Fall for the coming year were estimated to be less than $1000.00. Under these circumstances, no increase of Division dues was deemed necessary.

The Chairman noted that some division funds will be required for the of new Leopold Gelinas Awards in silver, noting with thanks the generosity of Jerry Rémick in funding both the striking and manufacture of the first issues of this award.

7. The **Leopold Gelinas Award** for the best M.Sc. thesis was awarded to **Steinunn Hauksdottir** for her thesis entitled ***Petrography, geochemistry and petrogenesis of the Iskut-Unuk Rivers volcanic centres, northwestern British Columbia***, completed at the University of British Columbia under the supervision of Kelly Russell. The Chairman read the citation and Ms Hauksdottir accepted the award amid applause.

The **Leopold Gelinas Award** for the best Ph.D. thesis was awarded to **Hélène Gaonac'h** for her thesis entitled ***L'hétérogénéité de la morphologie et de la rhéologie des laves: scaling et fractales***, completed at the Université de Montréal, under the supervision of John Stix. The Chairman read the citation and John Stix accepted the medal on behalf of Ms Gaonac'h, amid applause.

8. The **Career Achievement Award** was made to **Jack Souther**, the Chairman reading the citation (a copy

is included in this issue of Ash Fall). Jack then presented a talk entitled "Thanks and reminiscences since 1952" and received the award amid enthusiastic applause. (A synopsis of his acceptance is planned for inclusion in the next issue of Ash Fall)

9. Scheduled activities

Winnipeg '96

Kelly Russell and Tom Pearce proposed a session with the theme of frontiers and new directions in igneous petrology, with relevance to other areas of earth sciences. The suggested title was "Petrological Scene: Innovation, Change and Relevance". Bob Baragar suggested that Kelly Russell chair the session and Tom Pearce suggested Winnipeg as a venue. David Piper suggested the session as a CGC "coat-tails" workshop. Don Dingwell could provide a comparison Europe-North America. Possibly a publication or series of publications would be published in Geoscience Canada

Action: Cathie Hickson to contact organizing committee to see if such a session is feasible at this stage.

Ottawa '97

Mehmet Taner suggested a short course and related field trip to the Abitibi Greenstone Belt, possibly led by Wulf Mueller

Louise Corriveau proposed a Grenvillian volcanology session, highlighting the relation of upper to lower crustal processes, alkaline and monzonite magma emplacement into the deep crust, minettes and an associated field trip on dyke swarms and related volcanics.

John Stix proposed a possible joint session on magma emplacement and pooling

Action: J. Stix and L Corriveau to commence preparations for a special session for Ottawa '97

10. New business

- The Chairman requested input for the National Report on Volcanology, to be presented at the IUGG joint general assembly in Boulder, Colorado in July.

  Action: J.K. Russell to submit list of research on mafic and ultramafic rocks

- The Secretary-Treasurer requested advice as to the disposition of Division funds for special projects. The Chairman suggested that the bulk of the Division's assets be retained, to cover the cost of Medal production. The Secretary-Treasurer suggested t hat some funds might be made available at a future date to cover production of a field trip guide book, such as the trans-Mexican field trip guide book, sold by GAC Publications.

- Louise Corriveau suggested funding of student medal winners to the conference at which they received their awards. Kelly Russell noted that it is essential to ensure a future supply of medals. Tark Hamilton noted that the Geophysics Division awards a prize for best paper submitted. John Stix reminded the meeting that the known for Gelinas Awards.

- Future field trips were discussed. Kelly Russell and Steinunn Hauksdottir proposed Iceland as a venue Bob Baragar asked if contacts could be set up at University of Reykjavik; John Stix suggested a field guide be compiled for Iceland, with the reservation, expressed by the Secretary-Treasurer, that conflict with Icelandic volcanological publications be avoided.

  Action: The Secretary Treasurer to publish a preliminary call for participants in to ***Ash Fall.*** Steinunn Hauksdottir to make preliminary enquiries in Iceland.

- Ben Edwards proposed compilation of a showcase of B.C.'s volcanoes. The Chairman suggested organizing a Penrose Conference. Suggestions were tabled for the present.

11. J.K. Russell moved that the **meeting be adjourned**; 2nd by E. Chown. Carried unanimously.

OVER THE NET

ROLE OF THE GLOBAL VOLCANIC NETWORK IN REAL-TIME DISSEMINATION OF VOLCANO INFORMATION

The following is a compilation from an extended E-mail conversation between volcanologists over the Internet, addressing the role of the Global Volcanic Network (GVN) in distributing real-time or near-real-time information about volcanic eruptions. As with the eruption reports, those of you with volcano listserv have almost certainly ploughed through the longer version of this discussion, which took place during late June and July. The central question was that of dissemination of volcano information - in short, the purpose of such dissemination, requirements of the recipients and *caveat*s.

The most readable, terse and was a fairly lengthy message from Dan Dzurisin (U.S. Geological Survey), who stated that: "*The primary goal of most responses to volcanic unrest is hazards mitigation.....During a volcanic crisis, the most effective means to mitigate hazards is by deploying an experienced team and equipment to monitor the situation, assess the hazards, and advise local authorities*". Dan identified the VDAP (Volcano Disaster Assistance Program) as the best source of such a team.

Regarding ash hazards, Jerome Heffter (NOAA Air Resources Laboratory) noted that a National (U.S.A.) Plan for Volcano Hazards Alerts exists under the Office of the Federal Coordinator for Meteorology, includes participation by several government departments, NASA and the Smithsonian, and defines agency and inter-agency procedures and responsibilities for a volcano hazards alert. "*Specifics in the plan detail the timely collection and dissemination of information on the volcanic eruption and the forecast of the visual ash cloud in time and space (using the time dependent 3-D VAFTAD model). Eruption and ash information is given in an initial alert notification as soon as possible after a reported eruption, and the information is updated regularly in subsequent notifications until the end of the event. In addition, forecast visual ash cloud charts are disseminated over.....weather distribution systems and are simultaneously displayed through an INTERNET URL connection to the NOAA Air Resources Laboratory*". Chris Nye (Alaska Volcano Observatory) observed "*For real-time response a lot of the need comes from the airline industry. They need to be able to collect, deal with, and respond to information around the clock in a matter of 10-20 minutes*". Implicit in his statement was the airline industry's concerns about volcanic ash in the atmosphere and the need to involve other branches of earth science: "*Most of us earth scientists seem to believe that because volcanoes and volcanic eruptions are geological features we are necessarily involved in the emergency response to all aspects of eruptions. That is true for ground-based flowage-type hazards, but for plumes and volcanic clouds that feeling is not universally shared*". Rick Lawler (Northwest Airlines, Minneapolis) made a strong suggestion "*.....to include the Airline Dispatchers in any notification system*".

Meanwhile, back at the volcano, most folk seemed in agreement with Jon Fink (Arizona State) and Dan Dzurisin "..... *that a central role for GVN in any near real-time notification scheme makes good sense.....*", but that: "*Effective hazards mitigation would be difficult, if not impossible, to achieve by remote control*" and that (therefore): "*ALL pertinent information should be funnelled through a team of volcanologists at the eruption site, not for censorship but rather to ensure consistency in the message being delivered to public officials*".

All this boils down to the on-site team having control of summary information dissemination to officials and public, with the GVN acting as a relay to more remote clients such as airlines (who need it) and world press (who want it). Roland Machenbaum (Université de Savoie, France) noted that "*It is possible to bring the Internet to any point on the globe,.....at least e-mail which is enough*

*to automatically exchange (**sic**) data and reports"*. He added a rider that *".....it is dangerous to give access to the raw data to the public since some people without experience could misinterpret the data and give false alarm. So we concluded we should provide two types of access: the raw data for scientists involved in the monitoring of the volcano and a condensed daily report prepared by the observatory for the public and authorities"*.

The necessity for a single source of information inbound to the volcanic response team was emphasized by Dan Dzurisin: *"A mayor or police chief struggling to assimilate unfamiliar concepts during a crisis is not well served by multiple remote sources of information"*. The GVN was seen as the pipe to the on-site team. Dan added that: *"From a response team's perspective, any information that is not readily available at the response site and in near real-time is virtually useless"* and (in direct contrast to Machenbaum): *"During a crisis even those with information that might be pertinent to hazards mitigation should not assume that such amenities as an Internet connection, fax machine, or even a telephone are available at the response site"*. I think that most who have worked in Canada would side with the latter. Based on my experience, if a communications system can screw up, it will **and** at the least convenient time, **without** a volcano in the background breathing pyroclastic flows down one's neck.

The most interesting debate focused on the pertinence of information supplied to those on-site and the studies conducted. Once again, Dan led the way: *".....during a volcanic crisis all forms of information about the evolving situation are valuable to the scientific response team"*, but cautioned: *"Scientific studies conducted during a crisis for reasons other than hazards mitigation are often incompatible with an effective emergency response.....tend to cause distractions at a time when resources are extremely limited and the stakes are very high"*. Jon Fink disagreed with the last: *"While I have considerable respect for some of the research findings of USGS workers at active volcanoes, these constitute only a portion of our fundamental knowledge of how volcanoes work.....on-the-scene workers.....commonly have neither the time nor resources to make additional observations which may lead to the most important breakthroughs. Furthermore, the mission of the USGS does not necessarily place the understanding of basic physical and chemical processes, around volcanoes or elsewhere, as their top priority; that's more in the purview of NSF and the researchers it supports"*. All are valid points; Steve Sparks (Bristol University, U.K.) wrote (in mitigation?): *"The important point is not to exclude research studies on active volcanoes but to make the research workers aware and sensitive to the priorities that mitigation must have"*.

All the debate was interesting and well argued; I've been able to reproduce only the highlights here. I tried (hopefully with success) not to warp anyone's words. I think it's fitting that Jon Fink, who engendered the debate, have the last word.

"Dan's central message, that all information should be routed through the people who are actively dealing with a crisis, strikes me as a worthwhile goal that we should strive to facilitate through whatever technological or organizational means are available. Such potential focusing might work even better if those "officially" sanctioned to deal with a particular crisis were open to contributions from other experienced scientists who might have complementary skills. This has not always been the case in the past".

Compiled by the editor

VOLCANIC ACTIVITY

Three areas at least are of interest from the point of view of volcanic activity. On the home front (Kamchatka-Alaska-Stikinia-Cascadia), not much is happening at present. Kanaga (51°55'N, 177°10'E) and Klyuchevskoi (56°03'N, 160°39'E) volcanoes had minor eruptions over the summer. We keep in touch with events there by courtesy of our colleagues at the Alaska Volcano Observatory. One piece of news, possibly with serious consequences, is that the Kamchatkan Volcanic Eruptions Response Team is extremely tight for funding and has been forced to discontinue their practice of weekly updates. We still get news from them, through the AVO

Paul Metcalfe

TONGAN UPDATE (ERUPTION AT METIS SHOAL)

The eruption at Metis Shoal has now developed from a submarine event to sub-aerial. A cone about 50-80 m high and 200-500 m across has formed. A white steam plume is rising 1000-2000 m and on occasions small explosions are producing ash columns to about 500 m. The active vent is in the south eastern corner of the island.

On Friday June 23 the Tongan govt. asked the New Zealand govt. for advise on the eruption at Metis Shoal. I was able to fly up on a RNZAF maritime patrol flight on Sunday June 25 for a good look. I was also able to get a ride on a tug boat up to the island on 27-28 June but 2 m seas prevented access. Below is a brief summary of the eruption to date.

Activity was first observed on June 6, and the growth of the lava dome above sea level was first observed on 14 June. By 20 June the lava dome was 240x280m and about 54 m above sea level. Volcanic eruptions were also reported from 2 other locations. As part of the over flight we flew the 2 other reported eruption sites and can confirm there is only one eruption source. They are evidently the location of the aeroplanes which observed activity!. Volcanic activity is reported from Metis in 1851, 52, 1858, 1878, 1886, 1894, 1967 and 1979. On at least 5 occasions it appears that islands were formed. The 1967 and 1979 events erupted dacitic pumice and formed low angle tuff cones, which were soon eroded away. The 1995 lava type is not known at this time.

Metis volcano rises about 1500 m from the sea floor. We have no detailed bathymetry of the cone. The present eruption has formed a steep sided lava dome which has split and subsided between June 20 and 25 as the NE part flows down some form of topographic slope. On June 20-21 a small lobe was extruded onto the top of the dome. By June 25 this lobe had been displaced NE about 40-50 m and was lower than the highest point which is now on the south side. The NE front of the dome was actively growing on June 20-21 but had stopped by June 25.

The Tongan govt. has been advised to place a no go zone around the island. They have also been briefed about LAZE (acid rain/fume), explosive outbursts, dome collapse and the formation of further shoals. Locally these volcanoes are known as 'Fonwafo'ow', which translates as Jack in a box!.

Chuck Wood and Prabu Ram from Volcano World have kindly put seven photographs up on their WWW site for me. If you wish to view the Metis photos, try the following:

http://volcano.und.nodak.edu/vwdocs/current_volcs/metis_shoal/metis_shoal.htm

Brad Scott, Institute of Geological & Nuclear Sciences, NZ (B.Scott@GNS.CRI.NZ)

PINATUBO, LUZON, PHILIPPINES

15.13°N, 120.35°E; summit elev. 1600 m
All times are local (= GMT + 8 hours).

In the first half of July, a secondary explosion and several lahars occurred on Pinatubo's flanks. The 11 July secondary explosion vented from a still-hot pyroclastic-flow deposit in the Sacobia fan, escaping at a spot approximately 10 km NE of the active crater. The phreatic explosion was apparently triggered when recently introduced rainwater penetrated into the pyroclastic-flow deposit's interior and flashed into steam.

The explosion was first noted by PHIVOLCS at 1506, and had subsided by 1624. The means of initial detection was unreported, but it was apparently not based on seismic signals. The plume associated with the explosion reached 9 to 10 km in altitude. PHIVOLCS reported that ashfall was mainly toward the ENE. Light ash fell at the former Clark Air Force base (~25 km ENE of Pinatubo) and nearby, but ash was absent at the town of Dinalupihan, 35 km SSE.

Since the eruption did not issue from the volcano itself, PHIVOLCS did not change Pinatubo's hazard status or the 10-km-radius danger zone.

Cloud cover prevented analysts at the NOAA Synoptic Analysis Branch from sighting a plume on (GMS) satellite imagery. They could determine that winds at 7.6 km altitude blew at about 46 km/hr to the WSW. News of a plume to 9 km altitude from aviation sources prompted them to issue an abbreviated volcanic hazards alert, and the NOAA National Meteorological Centre (NMC) to run the VAFTAD plume trajectory model (Bulletin v. 19, no. 6) for dissemination over weather distribution systems and display on INTERNET. Both the hazards alert and the plume trajectory model served to alert pilots, air traffic controllers, and airline dispatchers of the potentially hazardous plume.

Besides using NMC forecast meteorology, the input parameters for the modelling run included Pinatubo's active crater coordinates, and an assumed hour-long sustained eruption to 9 km. In essence, the run suggested that after about 12 hours in the 0-6 km altitude range the ash plume was widely dispersed and included the area to the ENE where ash was found on the ground.

At higher altitudes (6-11 km), the run suggested a gradual drift of the ash plume, primarily toward the W and SW. Although this higher altitude result was not confirmed by ground observations, it suggests possible westward transport of suspended particulates that may have only fallen in amounts too small to detect with simple field techniques.

Lahars came down the Pasig-Potrero river (in the volcano's SE quadrant) twice on 7 July, once on 9 July, and twice on 11 July. Some lahars reached 3-4 m in thickness, breaching inner dikes and thinning the line of defence for San Fernando, a settlement 40 km SE of Pinatubo (at the confluence of the Palawi and San Fernando rivers).

Lahars have followed these and other drainages (Bulletin v. 18, nos. 8-9, v. 19, no. 8) during every rainy season since the paroxysmal 15 June 1991 eruption. PHIVOLCS expects that both secondary phreatic explosions and lahars will recur as the monsoon season continues.

Rick Wunderman, Smithsonian Institution

SOUFRIERE HILLS MONTSERRAT, WEST INDIES

16.72°N, 62.18°W; summit elev. 915 m

The following is based on information as of 24 July from the Seismic Research Unit (SRU) team at the University of the West Indies and Volcanic Alert News Releases from the Montserrat Emergency Operations Centre. The SRU maintains a seismic network on Montserrat, currently composed of seven instruments.

On 18 July, villagers around Soufriere Hills volcano reported unusually loud rumbling noises coming from the fumarolic areas, light ashfall, and a strong sulfur odour. Following confirmation of these reports, the Emergency Operations Centre (EOC) in the capitol city of Plymouth, on the coast ~4 km W of the summit, was activated and fully operational by 1830 that night. Appropriate emergency support agencies were notified, including the SRU in Trinidad. The EOC also set aside two schools as refugee centres, but no evacuation was ordered.

As of the morning of 19 July, based on conversations with Montserrat residents, SRU believed the initial eruption was a small phreatic event with minor ashfall spread around the island by local winds. In accord with the inferred small size of the eruption, the Synoptic Analysis Branch of NOAA saw no evidence of a plume on satellite imagery. Seismicity has been elevated since August 1992, and an earthquake swarm began on 14 July. However, no additional increase in seismicity was associated with the 18 July eruptions.

An explosion earthquake at 0924 on 19 July was centred close to the top of Chance's Peak, the summit located on the W side of the crater rim. A field team led by Lloyd Lynch (SRU) trekked in from the N to make an initial inspection just after 1300. They reported minor explosions from an area SE of Tar River Soufriere, a fumarolic area ~1.5 km NE of the summit. The explosions took place at intervals of ~20 minutes, sending ash and steam ~40 m high. Activity is centred within the summit crater between Chance's Peak and the Tar River area. Based on these observations, no evacuations were recommended.

William Ambeh (SRU) led another observation team on the morning of 20 July to the Paradise Estate area (~2 km N of the summit), and additional monitoring equipment was installed in the Long Ground area (~2.5 km NE). Reconnaissance photographs taken from a Royal Air Force aircraft confirmed the early field reports. Later photographs taken from a Royal Navy helicopter indicated no increased activity in the Long Ground area.

The shallow earthquake swarm that began on 14 July ended on the 21st; depths were 2-4 km, and the largest event was M 3.5. Volcanic earthquakes were concentrated along the ENE and WSW areas of Lang's Soufriere. Eruptive activity was continuing on 22 July. Early morning ashfall was reported in Plymouth (~4 km W) and the SW-sector villages of Gages, Parsons, and Amersham. A small steam-and-ash eruption around 0800 lasted ~10 minutes. As of 1030 on 23 July, there had been no new volcanic activity.

At the request of Montserrat, the Government of France was sending two French scientists (arriving on 25 July) to provide the SRU with technical assistance and additional equipment. They will be joined on about 26 July by five geologists from the U.S. Geological Survey's Volcanic Crisis Assistance Team.

Soufriere Hills volcano sits on the N flank of the older South Soufriere Hills volcano, located at the S end of Montserrat Island (13 x 8 km). The summit area consists primarily of a

(Baker, 1985). Wadge and Isaacs (1988) dated a series of eruptions at 16-24,000 BP, and note that the youngest dome, Castle Peak dome in English's Crater, post-dates this by an unknown period of time. English's Crater is breached to the E. The capital city of Plymouth lies on the coast, ~4 km W of the summit.

An active fumarolic area, named Galways Soufriere, is located on the S flank of Soufriere Hills. There have been no reported historical eruptions, but some undated deposits and the cone have a young appearance. A radiocarbon date of ~320 BP from a pyroclastic-flow deposit is significantly younger than other radiocarbon dates from the volcano, but could result from the latest activity of Castle Peak.

There have been no reported historical eruptions, but some undated deposits and the cone have a young appearance. A radiocarbon date of ~320 +- 54 BP from a NE-flank pyroclastic-flow deposit is significantly younger than other radiocarbon dates from the volcano, but could result from the latest activity of Castle Peak. Because the sampling site has not been relocated for confirmation, this date is considered somewhat uncertain.

Periods of increased seismicity below Soufriere Hills volcano were reported in 1897-98, 1933-37, and again in 1966-67. Shepherd and others (1971) concluded that the 1966-67 seismicity was caused by a relatively small volume of magma injected from >10 km depth into a zone of fractured rocks below the volcano, and not from a shallow magma body.

References

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Shepherd, J.B, Tomblin, J.F., and Woo, D.A., 1971, Volcano-seismic crisis in Montserrat, West Indies, 1966-67: Bulletin of Volcanology, v. 35, p. 143-163.

Wadge, G., and Isaacs, M.C., 1988, Mapping the volcanic hazards from Soufriere Hills volcano, Montserrat, West Indies using an image processor: Journal of the Geological Society, London, v. 145, p. 541- 551.

Information Contacts: Richard Robertson, Seismic Research Unit, University of the West Indies, St. Augustine, Trinidad; Montserrat Emergency Operations Centre, Plymouth, Montserrat.

Ed Venzke, Global Volcanism Network

As of Aug 8th, the Department of Humanitarian Affairs (Geneva) reported increasing seismic activity, and that scientists monitoring the volcano had advised a raising of the level of alert. Beginning on August 6th, the elderly and sick from near the volcano, to the south (including the main town Plymouth) and to the east, were being evacuated to tent villages already in place in the north of the island. An estimated 1,500 people had already left the island - ed.

NEVADO DEL RUIZ ACTIVITY?

Reuter's is reporting that local emergency authorities on Wednesday, July 26, declared an alert and stepped up monitoring after detecting activity at a volcano that killed more than 25,000 people when it last erupted in 1985. The emergency committee in Caldas province, 75 miles (120 km) west of Bogota, said it took the measures after vulcanologists detected increasing activity at the 17,700-foot (5,400-metre) Nevado del Ruiz volcano. Authorities told local residents to avoid the area around the volcano for the next three days and stay alert for further warnings or signs of activity. Javier Mejia, director of the state geological institute Ingeominas, is quoted as stating that water seeping into the heart of the volcano appeared to have set off a series of tremors.

Reuters report contributed by Frank Reddy

LONG VALLEY CALDERA, CALIFORNIA

Clint Smitheman noted that press articles reported a drastic increase in the amount of carbon dioxide gas leaking from the flanks of Mammoth Mtn., located at the Long Valley Caldera in the Central Sierra Nevada Range of California. Dave Hill, Chief Scientist at the Long Valley Caldera replied that the coverage *"....has produced a reaction that is out of proportion to new information on the issue. Measurements made this winter when the ground was covered with thick accumulations of snow showed an increase in CO2 soil gas concentrations by 2 to 3 over the fall values. Quite likely, this increased concentration reflects a temporary buildup of CO2 beneath several metres of ice and snow". He added: "....we see nothing else to indicate an impending volcanic eruption. Earthquake activity within Long Valley caldera and beneath Mammoth Mountain has been low for the last several months. Deformation monitoring data show no unusual strain occurring either within the caldera or in the vicinity of Mammoth Mountain".* Presumably, measurements made this summer should reveal whether or not this is the case.

For additional details see the Long Valley caldera home page at:

(http://quake.wr.usgs.gov/VOLCANOES/Long Valley/index.html)

The Long Valley page contains up-to-date data from most of the USGS monitoring networks as well as information on the current status of the caldera. It is the intent that these home pages serve as an effective means of disseminating timely information about unrest or eruptions at the monitored volcanoes to the scientific community, civil authorities, and the public.

(Information contributed by Dave Hill, USGS)

MOUNT ETNA ACTIVITY

May 30th - June 12th

During a recent visit to Mount Etna we refrained from visiting the summit until the last day (June 12th), as the guides had reported sudden explosions from the Bocca Nuova, the biggest and most recent around May 20th. Activity from the craters was as follows:

Bocca Nuova: no noises apart from the possible faint sound of gas emanating steadily from the SSE part, without rhythmic puffs. There was a light wind which might have obscured very faint sounds. The fume was too thick to see the floor clearly, but 2 fuming vents were suspected about 100 metres apart, one beneath the north rim and the other SSE of it. The ejecta from the May explosion, which was clearly non-magmatic, were to be seen in the col between the Northeast Crater and the Bocca Nuova, where ejected fractured wall rocks were thickly scattered, less than a metre apart in some places. These rocks from the Bocca Nuova were found as far as the west flanks of the Northeast Crater, about 500 metres distant.

Chasm (La Voragine): silent emission of fume from a central vent about 10 metres wide.

Northeast Crater: Quiet, but huge white billows of vapour coming from the south side. The fume was much too dense to see the floor. A weak ashy plume from the Northeast Crater, contrasting with the white fume from the other craters, was seen from the aeroplane on arrival (May 30th). Much stronger activity was noted on June 8th from the vicinity of Bronte, when thick ash clouds up to 70 metres high, apparently the result of collapse, were seen at intervals between 10h 00m and 11h 00m.

Southeast Crater: Not visited, but the guides report quiet emission of fume only.

The guides have ceased taking tourists to the crater edges because they consider the situation dangerous, and JBM tends to agree with them. It is clear that the May explosion from the Bocca Nuova was very large, and the lack of any obvious premonitory build up is disquieting. The

situation reminds JBM of activity after the 1983 eruption, when the Northeast Crater in 1984 and 1985 suffered a series of similar sudden large non-magmatic explosions at intervals of a few weeks to months.

Certainly anyone working out there this year would be well advised to spend the absolute minimum time within range of the summit craters.

John B. Murray, Open University (j.b.murray@open.ac.uk)
Nicki F. Stevens, University of Reading (nfs@mail.nerc-nutis.ac.uk)

KILAUEA, HAWAII

The 12-year-long eruption on Kilauea's east rift zone continues, with vents on the southwestern flank of the Pu`u `O`o cone feeding directly into lava tubes. These tubes form within active lava flows and initially are very shallow. Over time, however, the tubes erode their base and gradually downcut to deeper and deeper levels. Near the vents, tubes are over 100 feet below the surface of the flows. Below the 2,300-ft elevation, the tube is shallower, and occasionally its roof collapses, resulting in "skylights." Despite these collapses, the tube is relatively stable down to the top of Pulama Pali, at about the 2,100-ft elevation. There have been no surface lava flows, i.e., breakouts from weak points in the tube, above this elevation for over a year. Below this point, however, the tube system is less stable because of the steep slope of Pulama Pali, and breakouts are common.

For the past months, we have witnessed a period of prolonged surface flow activity below the 2,100-ft elevation, with channelled `a`a flows on the slope of Pulama Pali and broad sheets of tube-fed pahoehoe breaking out on the coastal plain. The lava owes this period of high visibility to a series of three eruptive pauses in October and November and two more in March and April. Following each pause, the tube is reoccupied from the vents to the top of Pulama Pali, then breaks out to form new surface flows which follow a path of least resistance toward the coast. Since last October, there have been 15 separate ocean entries, lasting from one to four weeks, along nearly two miles of coast between Kamokuna and Highcastle.

During the three weeks preceding April 30th, most of the nearly 400,000 cubic yards per day of lava issuing from the vent flowed toward the western side of the flow field. Two tubes, the Lae'apuki (west) tube and the Kamoamoa (east) tube fed flows on the coastal plain. The Highcastle flow broke out of the Lae'apuki tube at the 340-ft elevation and advanced toward the ocean. Prior to the pause on April 11, lava was entering the ocean at Highcastle and Lae`apuki. Since the pause, we are once again seeing many surface flows on Pulama Pali and the coastal plain. Fed by the western flow, a large lava delta continues to grow beneath the sea cliff at Highcastle. This flow is continuing to expand along its west and east margins. Lava is also entering the ocean at Kamoamoa but at relatively low volume. As of May 12, 1995, the National Park Service had to close off access to the area because of noxious fumes produced where lava is burning the road. Check with the National Park Service before driving down the Chain of Craters Road to the active lava flows near Lae'apuki.

During the period June 27-July 3, the Kamoamoa ocean entry diminished, and only a small volume of lava intermittently entered the ocean at this location. The active lava pond within the crater of Pu'u 'O'o was 90-95 m below the rim.

Reprinted from VOLCANO WATCH and biweekly reports; both are INTERNET releases of the Hawaii Volcano Observatory

PYROCLASTIC HAWAII

Kilauea is world-famous as the "drive-in" volcano because of the passive character of its eruptions and the ease and safety of viewing the volcanic activity. Much to the surprise of those who have seen its approachable eruptions, Kilauea also has a history of violent phreatic or phreatomagmatic explosive eruptions. May 10 is the 71st anniversary of the most recent of these violent eruptions. On that day, a violent phreatic (steam) eruption began in Halema'uma'u that sent repeated columns of ash high into the sky. The explosions continued for 18 days, with the largest occurring on May 18. The steam explosions hurled rocks up to eight tons as far as 0.6 miles from the crater; these blocks still surround Halema'uma'u.

By far the most devastating historical eruption occurred at Kilauea's summit in 1790. Its enormous ash columns were somewhat similar to those of the eruptions at Mount St. Helens in 1980. The 1790 eruption began with phreatomagmatic (mixtures of water and magma) explosions of fine, hot particles of volcanic glass and ended with phreatic explosions that ejected small to large fragments and blocks of pre-existing rocks. The surface of the volcano was scoured by hurricane-like blasts of hot gases and ash, called base surge, that formed from collapsing columns of ash. The 1790 ash columns are estimated to have been about 30,000 feet high, based on reports of visibility from Kawaihae.

There is evidence for numerous explosive eruptions at Kilauea Volcano in the more distant past. Another prehistoric explosive eruption deposited a thin layer of ash about 1,200 years ago, whereas a much more extensive deposit, the Uwekahuna Ash, erupted between 2,100 and 2,700 years ago. The eruptions which produced the Uwekahuna Ash were much larger than those of 1790, but most of the deposits are buried by younger lava flows of Kilauea and Mauna Loa.

The Pahala Ash formed from even larger explosive eruptions earlier in Kilauea's history. Two one-to-two-metre thick ashes underlie the Uwekahuna Ash but overlie the thickest prehistoric ash, a reddish sequence of ash up to 85 feet thick where it is exposed in the Hilina Pali. The Pahala Ash is thus a composite of these separate ashes. The youngest is dated between about 3,500 and 4,800 and the oldest thick section is about 39,000 years old. The Pahala ash occurs in a scientific drillhole located near the Hilo airport, where it is still about four feet thick. The 39,000-year age on this thick unit is derived from the drill core.

Beneath the Pahala Ash is a sequence of even older ashes, including the Mo'o Ash, the Pohaka'a Ashes (seven layers), the Kahele Ash, and the Halape Ash. These ashes are older than 39,000 years old, although how much older is not known; all are exposed in the Hilina Pali.

The term "Pahala Ash" has been widely used to describe nearly all the thick soils on Hawai'i. The Pahala ashes on the south flank of Mauna Loa and those on Kilauea are all from explosive Kilauea eruptions. On the other hand, ashes near Hilo and along the Hamakua coast are from explosive eruptions of Mauna Kea. The ash layers in Hilo, commonly called the Homelani Ash, consist of many layers from different explosive eruptions. The highly variable thickness of the ash is caused by having different ash units represented. For example, the thickest ash, commonly up to 20 feet thick, consists of ashes from Mauna Kea that are older than about 120,000 years. This layer underlies a section of the 39,000-year old Pahala Ash from Kilauea Volcano, which lies, in turn, under several ashes from Mauna Kea that are roughly 20,000 and 10,000 years old. Depending on the age of the youngest underlying lava flow, all, or some, of these units may be present.

In the past, the entire Homelani Ash was correlated with the Pahala Ash on Kilauea. We now know that the thickest section of the Homelani Ash is from Mauna Kea, lies beneath the Pahala Ash, and is between 120,000 and 200,000 years old. It is likely that this thick ash unit erupted between 135,000 and 165,000 years ago, when the summit of Mauna Kea was covered by glaciers, and that melt water from subglacial eruptions triggered explosive phreatomagmatic activity.

Reprinted from VOLCANO WATCH, published by the Hawaii Volcano Observatory

VOLCANO PICTURES ON THE NET

For those in need of, or interested in, photographs of volcanoes, look at:

http://www.dartmouth.edu/pages/rox/volcanoes/elecvolc.html

on the world wide web. It may be helpful to you.

Another good source for volcano images is the Geologic Hazards Photos CD-ROM set put out by the National Geophysical Data Centre in Boulder, CO. There are about 60 volcano images in both TIF and PCX format, with caption info and viewer software; price around $70. Most of these images are also available in the Space & Science Round Table on GEnie, and some are probably available on the Web, in GIF or JPEG format. Individual slide sets are also available from NGDC for around $40. Contact: (303) 497-6215, or info@ngdc.noaa.gov.

Information from Dick Stoiber and Frank Reddy

VAFTAD OUTPUT AVAILABILITY

The NOAA Air Resources Laboratory time dependent 3-dimensional Volcanic Ash Forecast Transport And Dispersion (VAFTAD) model is used for volcano hazards alerts. The VAFTAD model focuses on aviation operations by forecasting the visual ash cloud location at time intervals out to several days following a volcanic eruption. Details of the model can be found in "Heffter, J.L., and B.J.B. Stunder,1993: Volcanic Ash Forecast Transport And Dispersion (VAFTAD) Model. Wea Forecasting, 8, 534-541". During an alert, model output charts of the forecast visual ash cloud are disseminated over the following weather distribution systems:

DIFAX (48 states)	slot numbers	0291-0294
AKFAX (Alaska)		0210-0213
HNLFAX (Hawaii)		0186-0189

and the World Area Forecast System (WAFS).

In addition, the charts have now been made available on INTERNET:

ftp://arlrisc.ssmc.noaa.gov/pub/vaftad/vaftad.html

Further details from:

Jerome (Nick) Heffter
NOAA Air Resources Laboratory
SSMC3 Room 3151
1315 Eastwest Hwy
Silver Spring, MD 20910
E-mail: nick@arlrisc.smcc.noaa.gov
Phone: (301) 713 0295 #124
Fax: (301) 713 0119

UPCOMING CONFERENCES AND SHORT COURSES
AGU SPECIAL SESSION ANNOUNCEMENT

T01. Southern Ocean Spreading Centres I: Pacific and Southeast Indian Ridges
T02. Southern Ocean Spreading Centres II: Atlantic and Southwest Indian Ridges

During the last few years, a number of marine geological and geophysical expeditions have begun to explore the hitherto little-known spreading centres of the southern oceans, in most cases as part of the global exploration phase of the RIDGE and InterRidge programs. Among the major foci of these programs have been problems that complement existing fast-spreading / slow-spreading paradigms (based primarily on knowledge from the northern Pacific and Atlantic regions), interactions between southern ridges and hotspots and the nature and origins of the distinctive Indian Ocean mantle. Papers are invited addressing all aspects of the tectonics, geology, geophysics and geochemistry of spreading centres south of approximately 30 degrees South, especially those presenting new data from previously poorly known regions. Papers presenting new theoretical or quantitative studies relevant to the region are also encouraged.

Convenors

T01: **David Christie**, Oregon State University, Ocean. Admin # 104, Corvallis, OR, 97331-5503. dchristie@oce.orst.edu;
James Cochran, LDEO, Palisades, NY, 10964, jrc@lamont.ldeo.columbia.edu
Jean-Christophe Sempere, University of Washington, School of Oceanography, Seattle WA, 98195, sempere@ocean.washington.edu.

T02: **Christopher Small**, LDEO, Palisades, NY, 10964, small@lamont.ldgo.columbia.edu
Neil Mitchell, Department of Geological Sciences, University of Durham, Durham, England, N.C.Mitchell@durham.ac.uk.

VESUVIUS SPECIAL SESSION AT AGU FALL 95 MEETING

VO1 Volcanism at Mount Vesuvius and Vicinity

This special session is an opportunity to present new results of research dealing with the volcanological, geochronological and geochemical characteristics of the eruptive products from ancient and historic Somma-Vesuvius and on volcanic products found in the Neapolitan area associated with the Campanian Ignimbrite. Interest in the past decade has focused on the physical and chemical characteristics of the Neapolitan volcanism in order to better assess the risk to lives and property of nearly 1 million inhabitants. Contributions on the pre-1631 AD history of Vesuvius are especially relevant.

Convenors

Frank J. Spera, Department of Geological Sciences, University of California, Santa Barbara, CA, tel: 805-893 4880, Fax: 805-893 2314, E-mail: spera@magma.geol.ucsb.edu
Benedetto De Vivo, Dipartimento di Geofisica e Vulcanologia, Via Mezzocannone 8, 80134 Napoli, Italia, tel: +39-81-5803318, fax: +39-81-5525739, E-mail: devivo@bio.dgbm.unina.it
Harvey Belkin, USGS, MS 959, Reston, VA 22092, tel: 703-648 6162, fax: 703-648 4227, E-mail: hbelkin@rgborafsa.er.usgs.gov
Robert Ayuso, USGS, MS 945, Reston, VA 22092, tel: 703-648 6347, fax: 703-648 6684, E-mail: rayuso@rgborafsa.er.usgs.gov.

MAGMATIC PROCESSES: EXPERIMENTAL APPROACHES

Mineralogical and Geological Societies of Great Britain
University of Bristol, ENGLAND, January 4-6, 1996

Hallimond Lecture: David Green, ANU, Camberra, Australia
Sessions include:

Experimental Approach to Petrogenesis (4.1)
Convenor: Mike Carroll, E-mail Mike.Carroll@bris.ac.uk
Keynote speaker: Michel Pichavant, CNRS, Orleans, France

Understanding Volcanic Eruptions (5.1)
Convenor: Steve Sparks, E-mail Steve.Sparks@bris.ac.uk
Keynote speaker: Oded Navon, Hebrew Univ. , Jerusalem, Israel

Hydrothermal Systems (6.1)
Convenor: Vala Rangarsdottir, E-mail Vala.Ragnarsdottir@bris.ac.uk
Keynote speaker: Terry Seward, ETH, Zrich, Switzerland

Volcanic Studies Group: Research in Progress (6.1)
Convenor: Jeremy Phillips, E-mail J.C.Phillips@bris.ac.uk

Cost: about #100 for non students; Includes registration, accommodation, and conference dinner.
Abstract deadline: September 30, 1995. Contact:

Ethel-Jane Cormack
Department of Geology, Wills Memorial Building
University of Bristol, Queens Road
Bristol BS8 1RJ, England
E-mail: Ethel-Jane.Cormack@bris.ac.uk
Fax: 44 117 925 3385 Tel: 44 117 928 7788

Further information: http://www/gly.bris.ac.uk/www/vsg/VSG.htm

EXPLOSIVE VOLCANISM AND PYROCLASTIC DEPOSITS IN EAST CENTRAL MEXICO: IMPLICATIONS FOR FUTURE HAZARDS

GSA Annual Meeting, New Orleans, Field trip #1; Oct. 30-Nov. 4, 1995.
Cost: $550 USD; includes car rental, fuel, hotels, breakfast and lunch bags.
Maximum number of participants: 24 (Follow registration procedures outlined in GSA Today)
Leader: **Claus Siebe, Instituto de Geofisica, UNAM, Ciudad Universitaria, C.P. 04510, Coyoacan, Mexico, D.F. Tel. (525) 622-4146 FAX: (525) 550-2486**
e-mail: CSIEBE@tonatiuh.igeofcu.unam.mx

Itinerary

Oct.30: Arrival 7.00 PM at Popo Park Hotel located at the W slopes of Popocatepetl.
Oct. 31: Pyroclastic deposits at N and W slopes of Popocatepetl.
Nov. 1: Debris avalanche deposits at the S slopes of Popocatepetl.
Nov. 2: Lahar deposits, E slopes of Popocatepetl. Prehispanic archaeology of Cholula.
Nov. 3: Pyroclastic deposits at Pico de Orizaba; Las Cumbres Caldera; Las Derrumbadas rhyolite domes and explosion craters.
Nov. 4: Pyroclastic deposits at Cerro Pinto rhyolite dome, Cerro Xalapaxco tuff cone and La Malinche volcano.

REMINDERS (CONFERENCES ALREADY ADVERTISED)

December 9-10, 1995 (immediately preceding the Fall AGU meeting): Mineralogical Society of America Short Course on STRUCTURE, DYNAMICS, AND PROPERTIES OF SILICATE MELTS; San Francisco area, California. Info from:

D.B. Dingwell
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July 29 - August 2, 1996: PAN PACIFIC HAZARDS '96; A Conference on Earthquakes, Volcanoes and Tsunamis; Vancouver, British Columbia. Info from: Conference Chair, Disaster Preparedness Resources Centre, University of British Columbia, 2206 East Mall, 4th Floor, Vancouver, B.C. V6T 1Z3 Tel: (604)822-5518 FAX: (604)822-6164 E-Mail: dprc@unixg.ubc.ca

And last, but far from least: **GAC WINNIPEG '96.** Abstract deadline - December 1st. *(Don't forget the special session "Volcanic activity in extensional zones").*

LETTER TO THE EDITOR

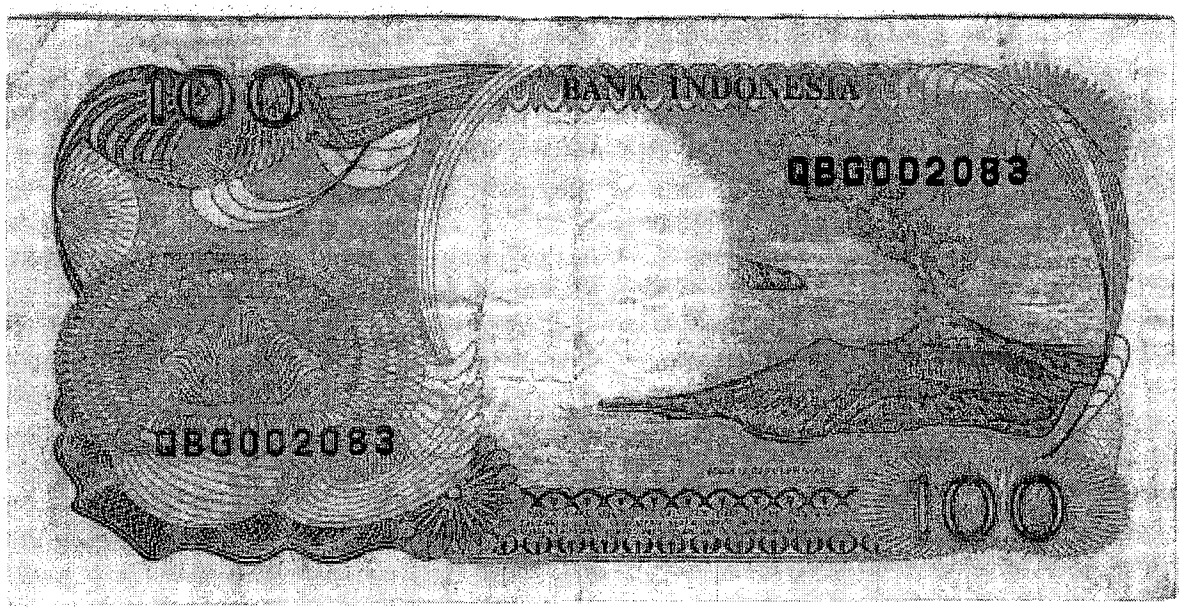
For some time I have been intending to write - in fact ever since the last issue of *Ash Fall* with the (crummy) reproductions of Indonesian bills bearing volcanoes.

You are right, they do indeed take volcanoes very seriously here (especially after the latest round of *nuées ardentes* from Merapi). But your correspondent did not give you the whole story. I enclose the third and most impressive (at least certainly the gaudiest) of the bills that sport volcanoes, with a vivid rendition of the tricolour crater lakes of Keli Mutu, Flores Island. The flip side features a local lute and one of the renowned hand woven *ikat* textiles from the nearby island of Rote. Legend has it that in the maroon lake live the souls of sinners; in the blue lake dwell the souls of the elderly; and the souls of young men, virgins and the pure of heart inhabit the green lake! It is only one of the many Indonesian volcanoes I aspire to visit but have not yet been fortunate to see (although I have twice climbed Merapi I have yet to make it to any of the volcanoes on the money). Why don't you try again, so as to get all three bills in and legible this time?

John M. Moore
Universitas Cenderawasih (Jayapura)

Many thanks for writing, John and I agree - they were crummy reproductions - I'd use a stronger word but this is a family show. I suspect that Lindsay Bottomer's reluctance to send me the higher denomination note was based on a healthy (and realistic) fear that I'd just spend it on beer. We're printing these directly this time, rather than photocopying. So, with thanks to Lindsay and to yourself, I've allotted a full-page spread this time. Enjoy.

Paul Metcalfe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CALL FOR NOMINATIONS

1996 AWARDS OF THE VOLCANOLOGY AND IGNEOUS PETROLOGY DIVISION

Career Achievement Award

A medal for Career Achievement is awarded by the Division Volcanology and Igneous Petrology of the Geological Association of Canada in recognition of career achievements in the field of volcanology and/or igneous petrology. Candidates are judged on their lifetime scientific contribution. The award is made only when a suitable candidate is found who is judged to have made major contributions to basic knowledge or clear and significant breakthroughs in volcanology or igneous petrology.

***Nomination Procedure*:** Nominations for this award are due in January, and should be sent to the Secretary-treasurer, Division of Volcanology and Igneous Petrology. The nomination should include the nominee's curriculum vitae and a clear statement from the nominator describing the candidates significant contribution to the field. Each candidate will be considered three consecutive years.

Leopold Gelinas Awards

The Volcanology and Igneous Petrology Division of the Geological Association of Canada annually present two medal for the most outstanding theses, written by Canadian or submitted to Canadian universities, which have contents that are at least 50% volcanological or igneous petrology related. A gold (plated) medal is awarded for the best Ph.D. thesis and a silver medal is awarded for the best M.Sc. thesis. Nominated theses are evaluated on the basis of originality, validity of concepts, organization and presentation of data, understanding of volcanology, and/or igneous petrology, and depth of research. Awards will not be made if the panel of judges considers that there are no worthy nominations.

Nomination Procedure: Nominations for this award are due in January, and should be sent to the Secretary-treasurer, Division of Volcanology and Igneous Petrology. The nomination must include a copy of the thesis (to be returned), a letter of nomination which must include a clear statement from the nominator describing the contribution the thesis makes to the field of volcanology and/or igneous petrology.

Secretary-Treasurer: Paul Metcalfe
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(please post)