

IAVCEI News 2000 No: 2

INTERNATIONAL ASSOCIATION OF VOLCANOLOGY AND CHEMISTRY OF THE EARTH'S INTERIOR

FROM THE PRESIDENT

The President's Message this issue consists of the opening remarks for the Bali General assembly by IAVCEI President Steve Sparks:

Honorable Minister/Honorable Governor,
Director of Mines, Colleagues,

I am delighted to welcome you all to the IAVCEI General Assembly for 2000 in Bali. The idea for a General Assembly in Bali was conceived sometime ago. Credit for this meeting must go principally to our Indonesian colleagues for their enterprise in proposing the meeting and energy in organizing what I am sure is going to be an outstanding event. Credit is also due to past President Grant Heiken, Secretary General Wally Johnson and the IAVCEI Executive Committee in their period of office for organizing such an exciting program of meetings over the next few years, of which this meeting is the highlight. At the outset, I would like to thank Dr. Ade Wirakusumah and the Organizing Committee of this General Assembly for all their effort and work on behalf of IAVCEI and the international volcanological community. Organizing a major international meeting is a formidable task and your efforts are greatly appreciated. The program of wonderful field trips, having scientific sessions and social activities looks outstanding, and I am sure everyone here will have a truly memorable experience.

The volcanoes of Indonesia have figured prominently in the advance of volcanological science. Most members of the public are likely to name Krakatoa as one of the most famous volcanoes in the world. Its eruption in 1883 had global effects, and alerted the world to the devastating effects of large volcanic eruptions. The huge eruption of Toba, 75,000 years ago, is also regarded in scientific circles as one of the greatest known eruptions from the geological records. Merapi and Agung are two other volcanoes which have figured prominently in the developments of volcanology. Likewise I suspect quite a few delegates will not have visited Indonesia before, and will be looking forward to experiencing the famous hospitality and seeing the wonderful volcanic landscapes of Indonesia.

I would now like to briefly dwell on the role of IAVCEI and share with you a vision of

where the organisation should be going. We live on a planet with an ever-expanding population and increasing stresses on the natural world from numerous activities. We are all, I suspect, aware of populations and cities expanding around potentially dangerous volcanoes. Humanity has also been lucky in not experiencing the largest kinds of volcanic eruptions. Given the increasing interdependence of the global community and the stresses on the environment, it can be argued that the Earth is particularly vulnerable to large natural hazards. A major caldera-eruption over the next few decades could well have serious and severe consequences. Certainly as a scientific community, we can expect that volcanic crises that thereafter large numbers of people can only increase in frequency in the next few decades as populations continue to expand.

With this background, I hope to see practical applications and societal significance of volcanology becoming increasingly prominent within IAVCEI. We are of course fundamentally a scientific Association. The

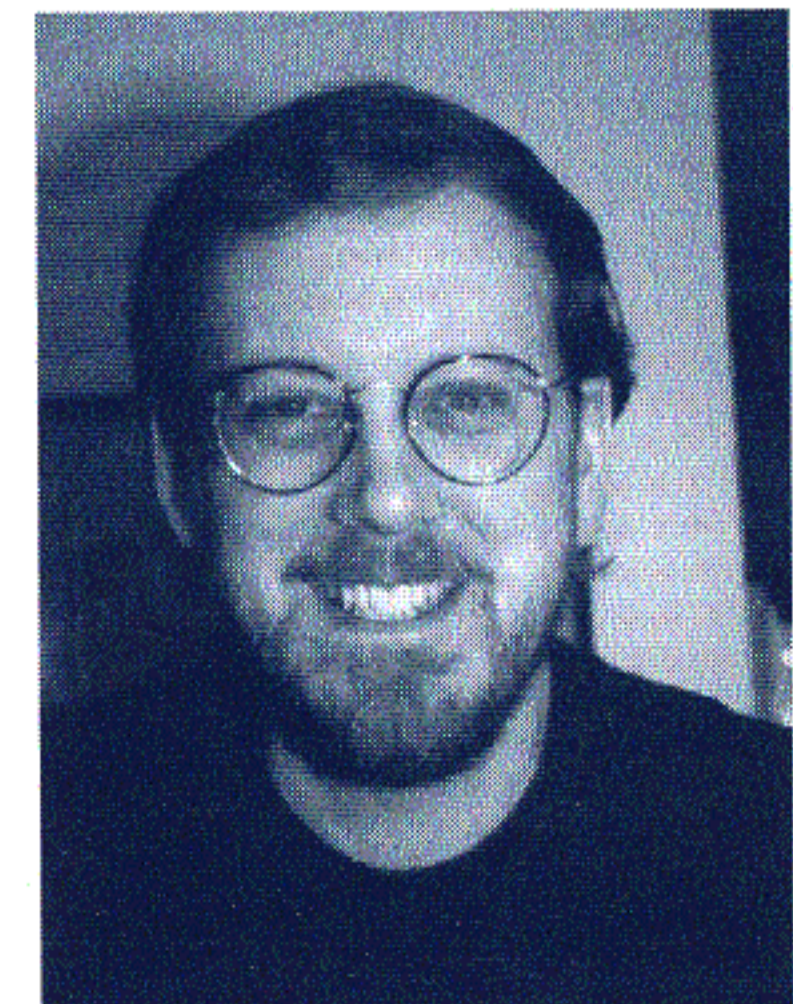


Steve Sparks

promotion of science related to volcanology and the chemistry of the Earth's interior, through providing means for scientists to communicate and to interact will always be high on our agenda. I think that IAVCEI is already successful at this with our General Assemblies, workshops, publication of Bulletin of Volcanology, Website, and, of particular importance, various grassroots activities instigated by IAVCEI Commissions. This success should be continued and developed. However, the IAVCEI mission is also to help the volcanological community to mitigate the effects of eruptions and to fulfill our societal obligations and responsibilities as scientists.

This aspect of IAVCEI is already becoming more prominent with the report of the IAVCEI committee on crisis protocols and the "Cities and Volcanoes" series of meetings. The Protocol generated some debate and even disagreements, but I suggest that this is healthy and to be encouraged.

Perhaps the most problematic area is how to communicate science in a crisis, and in particular how to communicate uncertainties and limitations in our knowledge. Public expectations of scientists can be high and sometimes unrealistic. Perceived failures to predict eruptions, or conversely, advice that leads to evacuations when nothing happens, can lead to rapid loss of credibility, and may even lead to more dangerous situations where a skeptical population ignores the scientific information and assessments. Issues such as how to improve forecasts, anticipate hazards, communicate scientific uncertainty, and evaluate risks objectively should be at the forefront of discussions in the volcanological community. However, discussions and debates need to take place in an atmosphere free of recriminations and confrontation with full recognition that these problems are difficult and that there are no easy solutions. I would like IAVCEI to provide new opportunities for discussing our societal role. There is perhaps a particular need for more opportunities to publish experiences, methods, and ideas on these issues as well as our normal scientific results, so that others can learn from experiences.



Steve McNutt

FUTURE MEETINGS
MEDAL
COMMISSION REPORTS

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CITATION FOR THORARINSSON MEDAL Awarded to Professor Keiiti Aki

Kei Aki, I have great pleasure as President of the International Association of Volcanology and Chemistry of the Earth's Interior in presenting you with the Thorarinsson Medal for 2000. The Thorarinsson Medal is the highest award of the International volcanological community and is given every 4 years only to those who have reached the highest levels of contribution and accomplishment. The Medal honours one of the great pioneers in volcanology, Sigurdur Thorarinsson, and is provided through the generosity of the Icelandic Geoscience Society.

The 2000 medal is awarded to Professor Keiiti Aki as a world-class seismologist who has applied his considerable intellectual powers and skills to the problems of seismicity at volcanoes and using seismicity to understand the internal structure and dynamics of active volcanoes. The many letters of support from colleagues in many leading scientific institutions make it quite clear that you are the pioneer and key scientist in understanding earthquakes at volcanoes. In the modern parlance you are quite simply regarded as the "Man". I note that enthusiastic and glowing testimony to your contributions came not only from academic specialists in your field, but from those charged with monitoring responsibilities on active volcanoes, showing the importance of your work to the practical applications of volcanology as well as to fundamental science. You have been at the forefront of seismological research for over 40 years.

Your career has been distinguished by an ability to propose and test physically reasonable models of elastodynamic volcanic processes. This has been fundamental for promoting a better understanding of processes leading to eruption and for improving volcano seismic monitoring practice. One of your most important contributions was to determine that the differences between different kinds of volcanic earthquake in terms of frequency content can be ascribed to a fundamental source effect rather



Keiiti Aki

than a difference in propagation path. This led to the concept that volcanic tremor can be viewed as continuous and random source excitation of long period earthquakes. Your 1977 paper on the source mechanism for volcanic tremor is regarded as seminal in understanding the relationship between magma movement, dyke propagation, and tremor. You have made pioneering contributions to understanding the role of movements of high pressure fluids and gases within the interior of volcanoes to generate

seismic signals. Your studies have included important field experiments on Kilauea, Long Valley caldera, Valles caldera and most recently Piton de la Fournaise on Reunion, where you have combined observations with development of analytical and numerical models. You have inspired outstanding students, such as Michael Fehler and Valarie Ferrazzini, and notably your former student and close collaborator Bernard Chonet, to develop these pioneering ideas into a new sophisticated era of volcano seismology. You have thus played a key role in the evolution of volcano geophysics into a highly quantitative and rigorous field of study using seismological theory and techniques. Another important contribution has been to pioneer seismic tomographic imaging techniques to explore the deep interior of volcanic systems and existence of magma chambers.

Steve Sparks

THANK YOU FROM Keiiti Aki

Thank you, President Sparks, for the kind words on my contribution to volcanology. I deeply appreciate the generosity of the open-minded IAVCEI for giving such a high honor to someone who has been a part-time volcanologist until only 5 years ago. I am pleased to hear in the citation that the volcanological community recognizes the importance of seismology, particularly for monitoring and modeling the eruption process.

I got interested in Volcanic Seismology 50 years ago, when I attended a summer school organized by Kuno and Minakami at a hotel on the slope of Mount Asama. Minakami was the champion of Volcanic Seismology initiated about 100 years ago by Omori, the founder of Seismology in Japan. Kuno was, as you all know, one of the best all-round volcanologists ever existed. He served as the president of the IAVCEI for a long time. He always encouraged young geophysicists to get involved in Volcanology.

In my early career, however, I worked mostly on earthquakes, until a program of research on geothermal energy was initiated at the U.S. Department of Energy under the leadership of George Kolstad about 25 years ago. With my interest in Volcanic Seismology of youthful origin, it was very natural for me to get involved in this program. I started to apply modern methods of Quantitative Seismology, which were maturing at that time for understanding geothermal and volcanic processes. This program supported my research continuously over 20 years, and was responsible for educating some of the currently most active volcano seismologists mentioned by President Sparks.

The name of Thorarinsson reminds me not only the great contribution of Icelandic scientists to volcanology, but also my two Nordic colleagues, Husebye from Norway and Christoffersson from Sweden, with whom I published a paper in 1977 initiating a new seismic analysis for determining the 3-D structure of the earth, now called Seismic Tomography as mentioned briefly by the president. It was a great experience for me to work with these Nordic scientists. Most of the content of the paper was written in 1974, but we had to argue and argue about every parts of it for nearly 3 years to finally agree in what was published. Japanese scientists tend to consider arguing as a waste of time, but when we finally agree after a long argument, you see things clearer and feel happier. I am happy to see that Seismic Tomography has been applied to most of the important volcanoes of the world for delineating their internal structure.

Many years ago, I learned from an experienced geotechnical engineer who worked in the western U.S. that there are three ways to deal with geological hazards. The most

satisfactory is to avoid it, like not living near a volcano. The next is to remove it, like getting rid of a hill that causes landslides. Finally the least satisfactory way is to treat it. It is getting more and more difficult to resort to the first two approaches with the increase in the world population, we are forced to treat geological hazards like earthquakes and volcanic eruptions. To treat them, it is required to predict their future behaviors. This is the most difficult task.

I used to think that volcanoes are more complicated than earthquakes, because they involve gas and fluid in addition to solid that was the only earth medium needed for understanding the ground shaking caused by the rupture of an earthquake fault. The structure of a volcano is also complicated with its much stronger heterogeneity and anisotropy than that of a fault zone. Working with earthquakes in Southern California for a decade or so, however, I realized that volcanoes are simpler than earthquakes in a very fundamental manner. An individual volcano exists before and after an eruption. But we can clearly identify an individual earthquake only after its occurrence. Before its occurrence we must consider a system of fault segments in a large area interacting each other. In other words, an individual volcano is a closed system, while an individual earthquake is a small part of a large system and cannot be defined separately from the surroundings. In this aspect, a volcano is simpler than an earthquake. This is a very important issue for modeling the system for prediction. The number of parameters needed for modeling will be far greater for an earthquake than for a volcano. A deterministic modeling may be impossible if the number of parameters is too large. I decided to switch from the earthquake to the volcano with the hope for learning some general guide for scientific approach to the prediction of geologic hazards starting with a system of the above fundamental simplicity.

Five years ago, I moved to La Reunion island in the Indian Ocean, and with the help of Valerie Ferrazzini developed various seismic monitoring methods and constructed a model of magma system under the Piton de la Fournaise based on the past data collected by the network operated since early 1980/92s by the Institute of Physics of Globe, Paris. A preliminary model was completed just before the major eruption of March 9, 1998, and we were able to experience how the model worked with monitored data before and during the eruption.

The Thorarinsson medal gave me an opportunity to speak about this experience to the international community of volcanologists in a scientific talk during this Assembly. Discussions and comments on my talk will help us how we proceed from here. Thus this medal will help me on my future research in a very timely manner. I shall treasure it as long as I live. Thank you.

Keiiti Aki

FROM THE PRESIDENT

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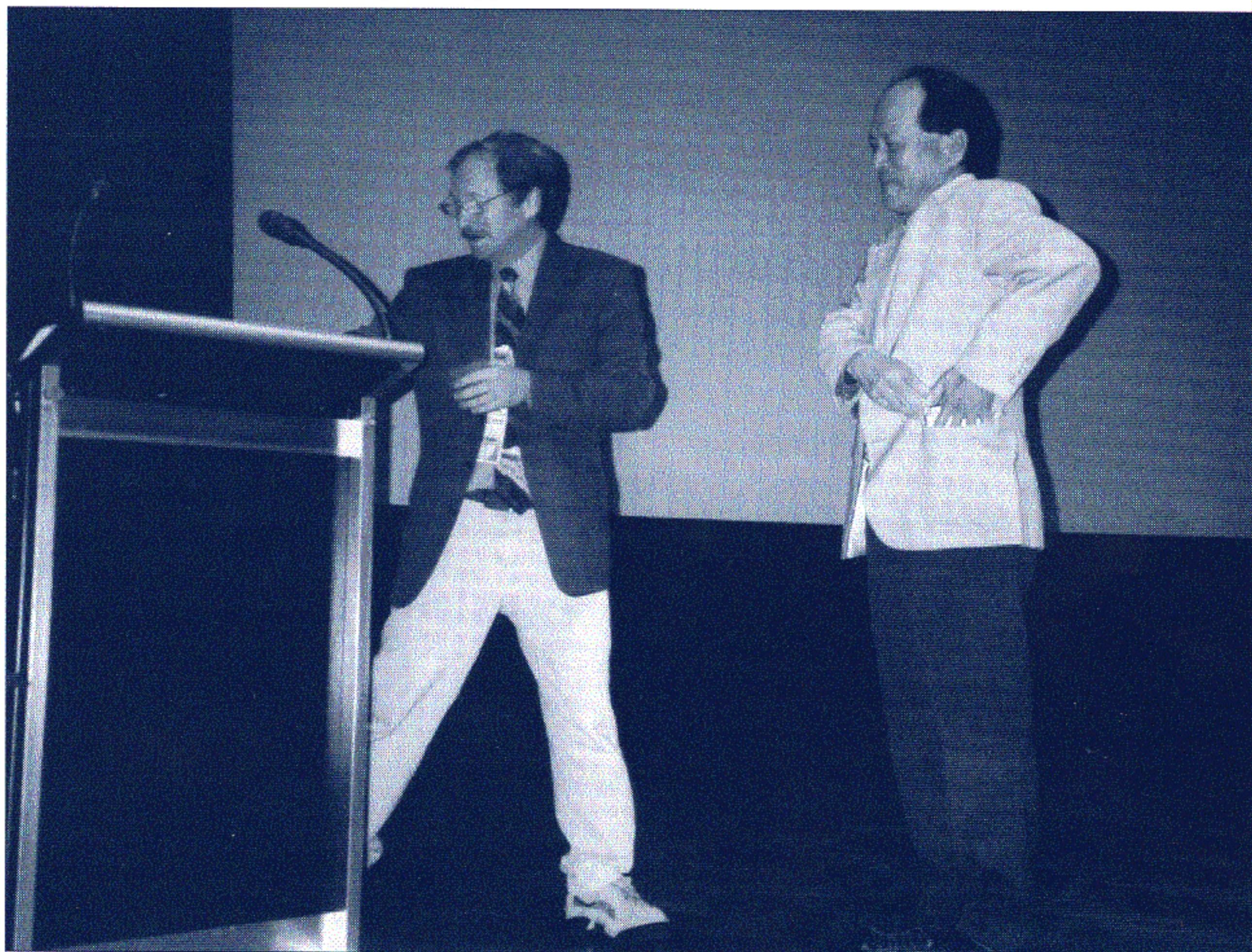
Steve McNutt and I, together with the new Executive Committee, are optimistic about IAVCEI. Past presidents Heiken and Gasparini, and Secretary General Wally Johnson have pioneered and delivered personal membership for IAVCEI, which provides a sense of ownership of the

Association throughout the International community. Recently we have started a recruitment drive for new members, as we believe that IAVCEI can only be strong and successful if it is fully representative of and engaged with the international volcanological community. I am pleased to report that membership has increased from 456 in 1998 to over 656 (59 countries) in 1999. Estimates are over 700 for 2000. I am also convinced that this still represents only a modest fraction of the community so that IAVCEI membership could be much more. This also gives me an opportunity of thanking Caroline Giddings for all her hard work as membership secretary. So please join if you are not yet a member, and persuade colleagues to join if you are. I draw attention to the new four-year membership scheme, which means you don't have to remember when and how to renew membership so often, and saves IAVCEI resources by cutting down on paperwork. The new IAVCEI Executive Committee will be meeting twice this week and we are always open to new ideas and member's views. The names of Committee members are in the meeting programme. Please feel free to let us know what you think we should be doing, and your ideas for IAVCEI.

IAVCEI has a healthy programme of future meetings. In 2001 there is the "Cities and Volcanoes" meeting in Auckland, New Zealand (February 12-16). Maar meeting in Germany, August 17-20. IAVCEI is also likely to be co-sponsoring a Penrose meeting with the Geological Society of America in June 2001 on magma genesis. In May 2002, there will be major IAVCEI workshops in the Caribbean to mark the centenary of the 1902 eruption of Mount Pelee, Martinique. The IUGG General Assembly in 2003 will take place in Sapporo, Japan. Given the location, this IUGG Assembly will be of particular interest to IAVCEI members, and IAVCEI plans to play a prominent role in the meeting with an attractive program of scientific sessions. Expressions of interest for the next IAVCEI General Assembly are emerging and I hope that an announcement on the next location in 2004 can be made soon.

I conclude by repeating my welcome to you all and thanks once again to all our Indonesian colleagues for hosting this IAVCEI meeting.

Steve Sparks



IAVCEI HOMEPAGE: <http://www.iavcei.org>

PENROSE CONFERENCE TO ADDRESS LONGEVITY AND DYNAMICS OF RHYOLITIC MAGMA SYSTEMS

A Geological Society of America Penrose Conference, "Longevity and Dynamics of Rhyolitic Magma Systems" will be held June 7-12, 2001, in Mammoth, California. Mammoth Mountain forms the southwest rim of the Long Valley caldera, one of three large Quaternary rhyolitic caldera centers in the United States. Long Valley, a site of recent volcanic unrest, lies at the heart of current debate over the mechanisms and time scales for the production, storage, and differentiation of rhyolite magma. Such information is critical to our understanding of fundamental geologic problems such as the formation and growth of Earth's continents and predicting volcanic hazards.

The purpose of the conference is to bring together petrologists, geochemists, volcanologists and geophysicists actively studying the generation and evolution of silicic magmas. We hope to try and resolve, or at least constrain, a number of very important and currently highly topical issues pertaining to the shallow-crustal evolution of large, typically caldera-forming, silicic magma bodies. These include:

- ◆ What is a magma chamber—a large, long-lived fractionating liquid body or a "sleepy" crystal mush that gets kicked to life every so often, re-mobilizing existing material?
- ◆ What do crystals really represent—phenocrysts vs. xenocrysts—and what 'memory' do they retain?
- ◆ What is the efficacy of, and driving forces for, convection/mixing in silicic magmas?
- ◆ What are the time scales needed to produce large, rhyolitic magma bodies?

A limited number of keynote talks will serve to outline the current state of knowledge concerning the generation and evolution of large rhyolitic magma systems, and will set the foundation for evaluation of existing paradigms, development of new models, and discussion of future research directions. Most of the meeting will focus on poster sessions and group discussions. Mid-meeting field trips to selected Bishop Tuff and Sierran plutonic locations will serve to raise questions concerning limits and constraints on sampling and interpreting geochemical data from pyroclastic deposits based on our knowledge of how large silicic systems erupt, links between plutonic and volcanic environments, and the importance of recharge and mixing in magma evolution.

The conference is limited to approximately 50 participants to ensure a 'workshop-type' atmosphere focussed on manageable discussions. We encourage participation of graduate students working on silicic magma systems; partial student subsidies will be available. The registration fee, which will include lodging, some meals, field trips, and all other conference costs except personal incidentals, is not expected to exceed \$750. Information on travel to the conference will be provided in the letter of invitation.

Application deadline is January 1, 2000. Please send email application, to Kurt Knesel (k.knesel@earth.uq.edu.au), which should include a statement of your experience and interests as related to the themes of the conference, and a proposed title for poster presentation. All applicants are also encouraged to include a

statement of what they perceive as the most critical questions that need resolution.

Co-conveners are: Kurt Knesel, Department of Earth Sciences, University of Queensland, St Lucia, Brisbane, Qld 4072, Australia, k.knesel@earth.uq.edu.au, phone +61 7 33659779, fax+61-7-33651277; George Bergantz, Department of Geological Sciences, Office Box 351310, University of Washington, Seattle, WA 98195-1310, USA, bergantz@u.washington.edu, phone 206 685 4972, fax: 206 543 3836; Jon Davidson, Department of Earth and Space Sciences, UCLA, Los Angeles, CA 90095-1567, davidson@ess.ucla.edu, phone 310 206 3042, fax 310 825 2779. Website: <http://www.geology.washington.edu/bergantz/penrose-2001.htm>

Jon Davidson <davidson@ess.ucla.edu>

THE ROLE OF THE COMMISSION ON VOLCANIC LAKES IN VOLCANOLOGY AND IAVCEI

Dear CVL Members,

During the summer 2000 Bali IAVCEI meeting, some significant changes took place in the organizational structure of the 'Committee of Volcanic Lakes' (CVL). I was nominated and elected as the new leader of CVL, and accepted the position. Alain Bernard was elected to become the new secretary/webmaster and accepted that position as well. We have waited with communications to CVL members until we received the formal confirmation from the IAVCEI leadership on the recognition of the changes in CVL (arrived 2 October 2000). In the light of earlier e-mail communications, we like to review the mission of CVL and how we as CVL members can contribute to its goals, and address some of the discussion that has been colouring the cyberskies over the last few days. Please note that this is a slightly updated electronic mailing list. We still need to go more thoroughly through lists of e-mails to make the ultimate update. This missive is also as a file in WORD98 (verbatim to what follows below).

Regards, Joop Varekamp & Alain Bernard

The CVL has an important role to play within IAVCEI and a significant scientific mission in volcanology. Volcanic lakes are used to monitor volcanic activity, they harbour their own volcanic dangers (CO₂ explosions, lahars, phreatic explosions), and may leak toxic fluids into the surface environment. In addition, they provide "deep blue" windows into the interior of volcanoes and even deeper into the magma source regions, with topical linkages towards ore deposition and geothermal energy development. Reasons enough to pay substantial attention to volcanic lakes. In addition, many global change researchers use volcanic lakes for the study of environmental change. The sedimentary records are influenced both by climatic / hydrological parameters and volcanic inputs, and the expertise of CVL members can contribute to decipher these records. It was the wisdom of the CVL originators to recognize that volcanic lake science is a special field with intertwined aspects of disciplines such as volcanology, limnology, geochemistry, and biology/toxicology. We thank Minoru Kusakabe and all the former steering committee members for their efforts, and congratulate them on their success in elevating 'volcano lake science' into a recognized field of inquiry, worthy of its own IAVCEI commission.

We should continue to communicate through regular meetings with CVL themes, either jointly with other meetings or as independent CVL conferences. We also should continue to organize workshops and fieldtrips, as has been done so successfully in the recent past by Minoru Kusakabe, Sergei Fazlullin and Alain Bernard / Manfred VanBergen. Apart from reaching our professional colleagues, there still is a rather open playing field in the communication of volcanic lake science to

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IAVCEI REMOTE SENSING COMMISSION - NEWS

This message contains some news that may be of interest to you. If there are any other items of news of discussion that you would like circulated, please send these to the Commission Secretary at kaneko@eri.u-tokyo.ac.jp

1) We look forward to meeting as many of you as possible during the IAVCEI General Assembly in Bali. In particular we will be holding an evening discussion meeting for anyone interested in the activities of the RSC (provisionally on Wednesday July 19, 17.30-18.30). This is YOUR commission, so if you think there are activities that we should initiate or encourage please come along and make your views known. One activity for the RSC that we would like to encourage is (in association with WOVO) to help volcano observatories adopt remote sensing as a low cost and routine monitoring tool. The Hawaii hotspot monitoring site at <http://volcano1.pgd.hawaii.edu/> is an excellent prototype for what could be achieved worldwide.

2) The call for papers for "Cities on Volcanoes 2", Auckland New Zealand 12-16 February 2001 has just been issued. There are several proposed sessions where RSC members may be able to make significant contributions: these include "Volcano surveillance", "Volcanic risk evaluation and mitigation", and "Agricultural impacts". We encourage you to consider participating in this meeting. The deadline for abstracts is 1 September. There seems to be no conference website, but the secretariat can be emailed at citiesonvolc2@gns.cri.nz The deadline for abstracts is 1 September.

Best Wishes,

Dave Rothery RSC Leader
T. Kaneko RSC Secretary

REPORT OF COMMISSION ON OCEAN ISLAND VOLCANISM

Last 4 years activities:

The OIC has co-sponsored 2 conference/field trips. The first was a 1996 Chapman Conference entitled "Shallow Levels Processes in Ocean Island Magmatism" convened by Wendy Bohrson, Jon Davidson and John Wolff. This conference, which was attended by ~50 scientists, was held on Tenerife in the Canary Islands and explored the subject of shallow-level contamination of ocean island magmas and the consequences of these processes on our understanding of compositional heterogeneity of the mantle. A one-day field trip that examined volcanic features of Tenerife accompanied the conference. A special issue of *Journal of Petrology* (May, 1998) was published based on proceedings of this conference.

In 1998, a Penrose conference entitled "Evolution of Ocean Islands" was convened by Dennis Geist, Karen Harpp, and Wendy Bohrson in the Galapagos. Approximately 65 scientists gathered to examine the geology as well as the abundant and friendly wildlife. The first 5 days of the

conference were devoted examining Galapagos volcanoes in various stages of evolution, with talks and discussion sessions in the evenings. The remainder of the conference examined the volcanological, petrological, geochemical and geodynamical evolution of ocean islands through keynote presentations, oral presentations and posters. Particular emphasis was placed on integration of geochemistry and geophysics.

Plans for next 4 years:

OIC conference, 2001: The third conference/field trip so-sponsored by the OIC will take place in Costa Rica in January, 2001. Conveners are Barry Hanan and Kaj Hoernle. The emphasis of this conference will be on flood basalt events and their connection to hotspots and/or on the initiation and long-term temporal evolution of hotspots. A pre-conference fieldtrip to Gorgona and post-conference fieldtrip possibly to Haiti or Hispanola may be combined with fieldtrips during the conference to Quepos, Tortugal and Nicoya. We propose to start the conference in Quepos. After 2 days of overview talks and looking at rocks at Quepos for a day, the conference will move on to Tortugal for a day field trip, followed by one or two days of fieldtrips to Nicoya. We will resume the talks at some resort along the southern coast of Nicoya. The entire duration of the conference will probably be about 10 days.

Special session- Geological Society of America national meeting, Reno, NV, USA, November 13-16, 2000. Recent Results on the Causes and Consequences of Oceanic Island Volcanism: Where are we going next? is cosponsored by the OIC and the International Division of GSA. The conveners are Michael Garcia and Dennis Geist.

Newsletter: The first OIC newsletter, edited by Giray Ablay, will be sent in July, 2000. Brief statement of how commission is organized The origins of the new commission go back to the 1996 Chapman conference on Ocean Island Magmatism. The OIC was established to foster communication and interaction among scientists who work on all aspects of ocean island magmatism and volcanism. Integration of research across disciplines relevant to ocean island magmatism is a priority for the new commission. In addition, it is the goal of the commission to co-sponsor a major field trip/conference every 3 years. The chair of the OIC is Wendy Bohrson. Co-chairs are Kaj Hoernle, and Giray Ablay, who is also responsible for this newsletter. The leadership will step down sometime during 2000. We are soliciting nominations for new leadership. Status of web page The web page will be on-line by August, 2000.

Wendy Bohrson

THE INTERNATIONAL HEAT FLOW COMMISSION (IHFC)

1. General

The International Heat Flow Commission is a commission of the International Association of Seismology and Physics of the Earth (IASPEI). As stated in the guidelines of the IHFC, the IAVCEI and IAPSO are co-sponsors of and participate in the activities of the commission'.

The International Heat Flow Commission was founded after the 1963 resolution of the 13th General Assembly of IUGG in San Francisco, and the first meeting of the commission was held in 1964. In the present guidelines of the Commission, accepted already in the 1970's, the activities are defined as follows

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Have you renewed your IAVCEI membership for 2000? IAVCEI Secretariat, PO Box 185, Campbell, ACT 2612, Australia Phone: +61 2 62487407 Fax: +61 2 62487407 E-mail: iavcei@interact.net.au

- (A) Developing and recommending standards and techniques for the determination of all parameters necessary to geothermal research, such as: Thermophysical properties of materials, underground temperatures, quantification of geothermal energy resources, etc.;
- (B) Gathering, estimating quality and publishing of heat flow density data as well as other geothermal data of interest;
- (C) Organizing and co-sponsoring international scientific meetings and expeditions as necessary;
- (D) Initiating or co-sponsoring the publication of monographs about specific aspects of geothermal problems;
- (E) Creating Working Groups (WG) as necessary for investigating and reporting on specific geothermal problems.

Through the years, these guidelines have been followed almost literally, and such activity is continued. For instance, the IHFC maintains and updates the Global Heat Flow Data Base (custodian Daniel Pribnow, GGA, Hannover, Germany). The data base which can be downloaded digitally by any interested person via the Internet on the homepage of the commission (kept by Dr. Shaopeng Huang at the University of Michigan, Ann Arbor, <http://geo.lsa.umich.edu/IHFC/heatflow.html>). The same information in a technically slightly different format is also available from http://www.bgr.de/n114/dp/globalq/glob_he.htm, and <http://dc.gfz-potsdam.de/gis/heat/>.

Our commission members and officers show continuous activity in organizing geothermal conferences and sessions in international meetings as well as compiling special issues and monographs on geothermal topics. Further, there are active working groups on compilation of heat flow measurements to the data bases with areal representatives worldwide, as well as compiling temperature profiles for palaeoclimatic interpretation of underground temperatures.

2. Organization

The Commission has a Chair, Vice-Chair, Secretary and Vice-Secretary (the officers or the Bureau of the Commission), and presently fifteen regular members. The members of the Commission are elected in the official business meetings of the Commission arranged in connection with the IUGG general assemblies every four years. The membership of regular members is restricted to a maximum of three four-year terms. At the same time, the maximum number of terms of the officers of the board are also restricted to three terms. For instance, the new Vice-Chair becomes the Chair after his/her first term, and serves his/her last term as the Past-Chair. This circulation of posts and restricted number of terms brings new people and ideas into the commission, but also secures the continuity of our activities. Through the years, this system has worked very well, and our global representativeness has been good when the distribution of the commission members on the globe is considered.

In the past, Francis Birch, Elena Lubimova, Lajos Stegena, Alan Beck, Seiya Uyeda, Henry and Vladimir Cermak have served as the Chairs of Commission. The IHFC members for 1999-2003 are listed below:

Bureau:

Chairman: Ilmo T. Kukkonen, Geological Survey of Finland, Espoo, Finland

Vice-Chairman: David S. Chapman, University of Utah, Salt Lake City, USA

Past Chairman: Vladimir Cermak, Czech Academy of Sciences, Prague, Czech Republic

Secretary: Christoph Clauser, Aachen Institute of Technology, Aachen, Germany

Vice-Secretary: Jan Šafanda, Czech Academy of Sciences, Prague, Czech Republic

Johannesburg, South Africa

3. On the activities of the IHFC

Our Commission members and officers are continuously very active in organizing geothermal conferences, sessions and workshops in international meetings as well as compiling special issues and monographs on geothermal topics. In addition to this we keep the above mentioned data bases updated and available via the internet. During the past few years several meetings have been organized by or been sponsored by the IHFC, and the annual number of such meetings is typically 2-3. A list of the books, monographs and special issues summarizing the major contributions presented on symposia and workshops organized or co-organized by the International Heat Flow Commission is given at the end of the report.

The current activities for 2000 are as follows:

The IHFC supports the following meetings in 2000:

- (1) Geothermics at the Turn of the Century, Evora, Portugal, April 3-7, 2000 At the 31st International Geological Congress, Rio de Janeiro, Brazil, August 6-17, 2000; two geothermal sessions will be organized;
- (2) 'Geothermics of South America' (conveners A. Förster and Valiya M. Hamza)
- (3) 'Past Climate Change and its geological signature' (supported also by IGCP 428, conv. V. Cermak)
- (4) Geothermal paleoclimatic workshop, Sinaia, Romania, in the first half of October (convened by S. Veliciu)

The following geothermal publications are being prepared:

- (a) Special issue of Global and Planetary Change, 'Climate from Boreholes' (editors H. Beltrami and R. Harris), accepted for publication;
- (b) Special issue of Physics of the Earth and Planetary Interiors, 'Thermal Studies of the Earth's Structure and Geodynamics' (editors I. T. Kukkonen, V. Cermak and B. Kennett); review process underway;
- (c) Special issue of a Russian journal with papers presented at the conference 'The Earth's Thermal Field and Related Research Methods', organized by Yu. Popov. 80

A contribution of the IHFC for the IASPEI Handbook to be published for commemorating the Centennial anniversary of IASPEI is currently being compiled by V. Cermak, including short texts on the history of geothermics, the most relevant achievements of geothermics in the second half of the 20th century, the role of IHFC and its activities, lists of essential publications, etc. The Handbook will be published as a CD and be available via the internet as well.

The activities planned for 2001:

- (1) 5th Int. workshop Terrestrial Heat Flow and the Structure of the Lithosphere, organized by V. Cermak in Kostelec, Czech Republic, June 10-16.
- (2) IAGA-IASPEI General Assembly, Hanoi, Vietnam, August 18-30, 2001

The semiannual official business meeting of the IHFC will be held in Hanoi. In addition, two thermal sessions have been suggested for Hanoi:

1. A Full-day symposium 'Temperatures within the Earth—Measured, Modeled and Indicated' Conveners: I.T. Kukkonen (Espoo, Finland) and W. Mooney (MenloPark, USA), I.Artemieva (Uppsala, Sweden) and Saskia Goes (Zurich, Switzerland)
2. A half-day workshop 'Borehole Temperatures as Imprint of Geological History, Hydrogeology and Changing Climate (Co-sponsored by IGCP 428 programme), Conveners: V. Cermak (Prague) and H.N. Pollack (Ann Arbor)

The activities planned for 2002:

'International Geothermal Conference', Moscow, Russia, to be convened by Yu.Popov.

In the years coming, the IHFC will continue its work in organizing meetings and editing special issues and monographs on geothermics as well as compiling the global heat flow data into public data bases. There has been a slight decline in the 'classical' heat flow work, i.e., producing and interpreting heat flow density measurements during the last decade. However, it does not imply that basic measurements of heat flow density would not be needed or produced anymore. On the contrary, there are still areas in many continents covered with very few measurements, and the IHFC encourages all competent groups to produce new geothermal data. Further, as most of the data is produced from relatively shallow holes, there is always a need to improve our data sets with deep holes for understanding the vertical variations in heat flow density. It is highly relevant for the use and applicability of the data presented in the global heat flow density data base. Such work is continuously encouraged and supported by the IHFC and discussed in the meetings and publications organized by the Commission.

There is also a general tendency and need to combine heat flow work more closely with other disciplines of geosciences, in order to expand the applicability of our data and methods of interpretation. These topics were widely discussed when the Commission last time (1999) elected new members. It was particularly desired that we need to have more representatives from the fields such as oceanic heat flow, permafrost, hydrogeology and applied geothermics. These aims are now (to a great deal) represented in our new list of members. On the organizational level, we would look forward in having closer connections with the IAVCEI and IAPSO. Thermal problems are relevant to all geosciences.

4. Books, monographs and special issues summarizing the major contributions on symposia and workshops organized or co-organized by the International Heat Flow Commission, last 4 years.

- V.Cermak (Ed.), Heat Flow and the Structure of the Lithosphere—IV, Tectonophysics, 291 Nos.1-4 (1998), pp.1-298
- G.Buntebarth (Ed.), Microtemperature Signals of the Earth Crust, Technische Uni., Clausthal-Zellerfeld, (1998) 189 pp.
- C.Clauser, T.Lewis and L.Rybach (Eds.), Thermal Regimes in the Continental and Oceanic Lithosphere, Tectonophysics, 306, Nos.3-4 (1999), pp.259-470.

Ilmo T. Kukkonen, Chairman of the IHFC

e-mail ilmo.kukkonen@gsf.fi

List, containing the granite-related meetings known for the next 2 years, is offered every other month, or so, by L. Baker <lbaker@uidaho.edu> no web page is available up to now.

Unfortunately, I will not attend the Bali conference (IGC at Rio is enough for me, as my health has been altered since last February).

Bernard Bonin

e-mail: bbonin@geol.u-psud.fr

SUMMARY OF ACTIVITIES OF IAVCEI COMMISSION ON GRANITES

Last 4 years activities:

1997: IAVCEI General Assembly at Puerto Vallarta (Mexico):

- ◆ Symposium 9 "High-level silicic magmatism and related hydrothermal systems", convenors: R. Seltmann, B. Lehmann, J.B. Lowenstern and P.A. Candela, co-sponsored by IGCP Project 373,

1998: IAVCEI International Volcanological Congress at Cape Town (South Africa):

- ◆ Symposium 7a "Granite related mineralization", convenors: R. Scheepers, P.A. Candela, R. Seltmann, co-sponsored by IGCP Project 373,
- ◆ Symposium 7b "Erupted and non erupted granites", convenors: S. Milner, S. de Silva and B. Bonin, in connection with Commission 1 "Explosive volcanism",
- ◆ 1999: IVth Hutton Symposium at Clermont-Ferrand (France) "The Origin of Granites and Related Rocks", convenor: B. Barbarin.

Publications:

1996: The Third Hutton Symposium on the Origin of Granites and Related Rocks. Editors: M. Brown, P.A. Candela, D.L. Peck, W.E. Stephens, R.J. Walker and E-an Zen. Trans. R. Soc. Edinb.: *Earth Sci.*, 87, 1-359.

1997: High-level silicic magmatism and related hydrothermal systems. Editors: R. Seltmann, B. Lehmann, J.B. Lowenstern and P.A. Candela. *J. Petrol.*, 38, 1617-1807.

1999: The Origin of Granites and Related Rocks, Fourth Hutton Symposium, abstracts. Editor: B. Barbarin, *Documents du BRGM 290*, 1-249.

Plans for next 4 years:

2000: publication:

- ◆ The Fourth Hutton Symposium on the Origin of Granites and Related Rocks. Editors: B. Barbarin, B. Bonin, J.L. Bouchez, D.B. Clarke, M. Cuney, H. Martin, W.E. Stephens. *Trans. R. Soc. Edinb.: Earth Sci.*, in prep.
- ◆ 2003: Vth Hutton Symposium at Toyohashi (Japan) "The Origin of Granites and Related Rocks", convenors: S. Ishihara, T. Nakajima, T. Shimura, T. Kutsukake and M. Takahashi.

Participation to the next IAVCEI venues (not yet finalized):

Brief statement of how commission is organized
Besides the formal organisation with a chairman (P.A. Candela) and a secretary (B. Bonin), which is not the most important point, the Commission 9 Granites has two major activities:

The Hutton Symposium held every 4 years (like the Olympic Games) in different countries (87: Edinburgh, UK, 91: Canberra, Australia, 95: College Park, Maryland, USA, 99: Clermont-Ferrand, France),

The granite discussion network launched in 1995, whose electronic address is now: Granite-Research List <granite-research@is.dal.ca>

About 800 persons have subscribed. Free contributions are allowed and encouraged, and advertisements for granite-related venues are accepted. In addition, a Meeting

ERUPTION AT SEMERU, INDONESIA JULY 27, 2000

We sadly post this report:

At approximately 0621 on the morning of 27 July an eruption from the summit crater of Semeru resulted in two deaths and injuries to six other volcanologists near the crater. Both fatalities, Wildan and Mukti, were Indonesian scientists from the Volcanological Survey of Indonesia (VSI).

Other members of the group sustained injuries caused by ejected material. These included Kris from VSI, Amit Mushkin from the Hebrew University in Israel, Mike Ramsey from the University of Pittsburgh, and Lee Siebert and Paul Kimberly from the Smithsonian Institution. Kimberly's injuries were more serious, including a broken hand, broken arm, and 3rd-degree burns. He is now recovering in a Singapore hospital. The members of the group had attended a meeting of the International Association of Volcanology and Chemistry of the Earth's Interior (IAVCEI) in Bali during the previous week.

Background: Semeru, the highest volcano on Java, and one of its most active, lies at the southern end of a volcanic massif extending north to the Tengger caldera. The steep-sided volcano, also referred to as Mahameru (Great Mountain), rises abruptly to 3676 m elevation, towering above coastal plains to the south. Gunung Semeru was constructed south of the overlapping Ajekajek and Jambangan calderas. A line of lake-filled maars was constructed along a NS trend cutting through the summit, and cinder cones and lava domes occupy the eastern and NE flanks. Summit topography is complicated by the shifting of craters from NW to SE. Frequent 19th and 20th century eruptions were dominated by small to moderate explosions from the summit crater, with occasional lava flows and larger explosive eruptions accompanied by pyroclastic flows that have reached the lower flanks of the volcano. Semeru has been in almost continuous eruption since 1967.

WOVO COMMISSION ACTIVITY

Here is a brief report on the WOVO commission activity:

a- From Boulder GA (1995) to the 1999 bureau was as follows:

Leader: Jean-Louis Cheminee, IPGP, France
Secretary: Marta Calvache, PVO, Columbia

Bureau: Lucia Civetta, Italy
Daniel Dzurisin, USA
Kazuhiro Ishihara, Japan
Ray Punongbayan, Philippines
Gudmundur Sigvaldason, Island
Wimpyu Tjetjep, Indonesia

This staff was normally renewed during Birmingham GA in 1999, but was not. It was renewed during Bali Ga. The current acting leader is Chris Newhall (USA).

- b- During the last 4 years, WOVO published only one newsletter. WOVO published the 'Directory of Volcano Observatories', in 1997, the last issue.
- c- WOVO organized and/or participated several meetings:
1997 (Vanuatu): Volcanic Hazards and Emergency Management in the Southwest Pacific. (in cooperating with UNESCO and SOPAC, see fax).

1998 (Azores): Advanced Study Course: Volcanic Hazard Assessment, Monitoring and Risk Mitigation (in cooperation with the Universidade dos Azores, and the European Commission).

1998 (Italy): Cities on Volcanoes, special WOVO meeting.

1998 (Philippines): Circum Pacific Workshop on Volcanology and Volcanic Disaster Mitigation (In cooperation with PHIVOLCS and UNESCO, see fax for the WOVO contribution and objectives for the future).

1999 (Cameroon): Expertise on the March eruption of Mt. Cameroon for the government of Cameroon in cooperation with the IRGM (Geological and Mines Research Institute).

- d- Intervention: Late May, a new eruption occurred at Mt. Cameroon. Beginning of June, WOVO organized the installation of a five seismic stations network for the surveillance of this volcano. At the end of the year, this temporary network will be replaced by a permanent one of twelve stations.
- e- Plans for the next four years will be according to the new bureau. Nevertheless, the main objectives could be:
- the database of volcanic unrest (WOVODAT) initiated by Chris Newhall;
 - a website devoted to volcano observatories;
 - establishing an international mobile network for volcano interventions;
 - a new directory of volcano observatories, both paper and electronic;
 - a newsletter in the website
- f. The 1997 WOVO Directory is on the web and in the IAVCEI site: <http://volcano.ipgp.iussieu.fr.8080/>

Jean-Louis Cheminee
cheminee@ipgp.iussieu.fr

BOOK REVIEW ENCYCLOPEDIA OF VOLCANOES

Editor-in-Chief H. Sigurdsson; Associate Editors B. Houghton, S. McNutt, H. Rymer, and J. Stix. Academic Press. ISBN 0-12-643140-X. 1417 pages. Cost: A\$185.00

Modern volcanology has benefited greatly over the last 20 years from people who have invested time and effort into compiling large, comprehensive books on different aspects of volcanism. Mammoth compilations that come to mind are Basaltic Volcanism of the Terrestrial Planets (1981); the USGS's Professional Papers on Hawaiian volcanism (a double mega-volume) and the Mount St Helens 1981 eruption; and, most recently, the Fire and Mud volume on the 1991 Mount Pinatubo eruption in the Philippines. Now these giant publications have been joined by a heavyweight newcomer, Encyclopedia of Volcanoes. This impressive compilation of information covers all major aspects of volcanism. It runs to 1417 numbered pages, weighs 3.7 kg, has an editorial team of five well known names in volcanology (led admirably by Haraldur Sigurdsson), relies on no less than 112 contributors, and contains 82 separate articles. No other single volume on volcanology published previously is so comprehensive in approach and detailed in content. Encyclopedia of Volcanoes was compiled at the end of the previous millennium. What better platform to take volcanology forward into the new millennium than to have this volume published in the year 2000.

The scope of the book can be appreciated by scanning the following list of titles of the nine parts that make up the volume: Origin and Transport of Magma; Eruption (eruptions in global overview); Effusive Volcanism; Explosive Volcanism (by far the largest of the nine parts); Extraterrestrial Volcanism; Volcanic Interactions (the least well defined of the nine parts); Volcanic Hazards; Eruption Response and Mitigation; and Economic Benefits and Cultural Aspects of Volcanism. There is not much that is left out from the volume. Even petrology and rock geochemistry find appropriate places, which was good to see, bearing in mind the aversion that some of the older generation of physical volcanologists still seem to have towards these topics!

Encyclopedia of Volcanoes is easy of use. There is a general summary at the beginning of each of the nine parts. Each article (within each part) is well organised, and has a glossary at the beginning and references at the end, so making each contribution self-contained. The readability of the articles is enhanced by effective editing and by an apparent absence of cross-referencing between articles, which otherwise would interrupt the flow of reading. There is an index of articles (arranged alphabetically) at the front of the book, as well as a good general index of subjects at the back. Also tucked away at the back in Appendix B is a 'Catalog of Historically Active Volcanoes on Earth' by Tom Simkin and Lee Siebert, developed and condensed for the Encyclopedia from another benchmark publication of the late twentieth century, *Volcanoes of the World* (Geoscience Press, 1994). This appendix is especially valuable, particularly taken in conjunction with the compact article on global volcanism on page 249 (also by Simkin and Siebert). There are several sections devoted to colour photographs of eruptions, deposits, volcanic landforms, and so forth. These enhance the overall attractiveness of the Encyclopedia and are a valuable resource in themselves for people needing to give slide and Powerpoint lectures on volcanism.

The logic of the arrangement of articles in the nine parts is quite easy to follow, although I did stumble about a bit at first. For example, I looked under the Economic Benefits part (Part IX) for something on copper-gold mineral deposits in volcanoes, but found the appropriate article in Part VI on 'Volcanic Interactions'. Similarly, Steve McNutt's well-constructed piece on volcanic seismicity appeared under Volcanic Hazards (Part VII) yet the article was not intended to be about hazards. Indeed, volcano-monitoring information in general was scattered throughout the Encyclopedia - readily accessible through the index, yes, but scattered nevertheless. An excellent Synthesis of Volcano Monitoring is provided (by three of the Associate Editors) perhaps to counteract this, but the synthesis appears under Part VIII (Eruption Response and Mitigation). Perhaps consideration should have been given to having volcano monitoring as a separate part to the Encyclopedia.

Works of this type have the potential to be inherently flawed and imbalanced because uniformity of quality depends, unreasonably, upon the sum of the equal contributions from different authors with different approaches, skills and abilities. Encyclopedia of Volcanoes largely escapes this pitfall. However, several articles do tend to have an overemphasis on the USA or else remain quite parochial in relation to the all-embracing 'global' title of the article. I made the mistake of trying to pick out some of the better articles (for the purposes of preparing this review) but failed miserably as the general quality is so high and such choices are mainly subjective anyway.

I have discussed with colleagues whether the title of the volume rather understates the scope and style of the subject matter. Most people, I think, would regard an 'encyclopedia' as a compendium of topics or subjects arranged alphabetically under single-word (or phrase) titles, rather like in the venerated, English-language, Encyclopedia Britannica. A better title might have been just Volcanology, had this not been used for previous books on the subject. The final name is probably fine, however, given that this Academic Press production will probably now be referred to simply, and unambiguously, as 'The Encyclopedia'.

Congratulations must be extended to the contributors, editors, article reviewers, and publishers of a fine piece of work. The Encyclopedia is a monumental achievement and will form a standard reference for many years to come. I remember a colleague of mine in 1981 having a carpenter make for him a special wooden lectern for his copy of the huge Basaltic Volcanism of the Terrestrial Planets. He set the short lectern near his desk and would rotate repeatedly on his swivel chair to access the book behind him and 'mine' it for information. Such veneration! I am thinking of doing the same thing with my copy of The Encyclopedia.

Volumes like this one are of course terrifying, to the extent that they set such high standards and may frighten off otherwise bold people from the essential challenge and on-going task of synthesising bodies of information that grow exponentially. Digital information management in volcanology is likely to gain prominence in the not-too-distant future and perhaps is an issue that could be addressed by the International Association of Volcanology and Chemistry of the Earth's Interior (IAVCEI) in conjunction with volcanological agencies with experience in such matters. The Encyclopedia serves to focus attention on this emerging issue.

R. Wally Johnson

Australian Geological Survey Organisation (AGSO)

Continued from Page 5

the general public. In the UK, a documentary on crater lakes was put together by Granada TV, George Kling had a nice write-up in National Geographic, and similar opportunities to peddle our scientific wares abound to those interested in these venues.

The CVL Newsletter had a good run for many years, thanks to the enthusiastic efforts of Sam Freeth, who whipped us up to not only promise papers but also to write them. Recently, the Newsletter faded somewhat as a result of logistical problems combined with the financial burden of producing and mailing a Newsletter to about 100 CVL members. We thought it would be wise to switch formats and establish a formal CVL website, which would become the main means of member communication. It will feature a message board, a membership list with contact info, short articles (similar to the Newsletter), an article archive, photo series and/or volcanic lake art, and news items such as new projects, preliminary results, funding opportunities, conference announcements etc. Alain hopes to have the formal structure of such a site ready by the end of 2000. Of course, he invites all of you to send available materials to him. We would still mail to those members that lack the needed internet access an annual paper copy of the site.

Continued on Page 10

More specifically we propose the following projects as future focal CVL topics

The creation of an on-line global catalog of volcanic lakes, which was proposed as a follow-up activity to the Crater Lake (OR) meeting. Such a database should be an integral part of the new volcanic unrest database (WOVODAT), an effort that is being spearheaded by Chris Newhall. The current Wesleyan University volcanic lake site (<http://www.wesleyan.edu/ees/volclakes.html>) is the humble beginning of such a larger effort.

Development of degassing technology and monitoring efforts of potentially explosive, CO₂-charged lakes

Volcanic lakes are monitored in many parts of the world for volcanic activity through temperature and water composition measurements. The database will provide a background for such monitoring efforts and helps to assess what type of changes are significant. General papers on temperature and chemical variations in crater lakes have appeared in the past, but these are rather theoretical and not easily applicable to real life cases. It would be worthwhile to organize a workshop for scientists from volcano observatories that study crater lakes to discuss the science of volcano monitoring through lakes. The generic computer routines that have been developed over the years by several scientists can be developed into site-specific tools, and can be linked to existing data sets to assess the nature of empirical anomalies.

Acid, toxic fluids escape from crater lakes and emerge in water-sheds down-slope on the volcano. In many areas, these fluids are sources of natural pollution, but used by the local population for irrigation and/or household purposes. The environmental impact of these hyperacid fluids is poorly known and deserves better study. Coordination with health professionals seems worthwhile.

Networking with global change researchers and participation in joint meetings

These are lofty goals that will keep us busy for the next few years. They will not only bring intellectual satisfaction to CVL members, but may contain aspects for the common good of people living near active volcanoes.

There have been a few e-mail messages that expressed some unhappiness with the procedural details of the transitions that took place at the IAVCEI Bali meeting. We like to make the following observations:

Minoru Kusakabe sent around an e-mail message announcing that he wanted to step down as leader of CVL, that it was time for some "fresh air" in the structure, and that he would like to call a CVL-members meeting in Bali at the IAVCEI conference. Earlier, Steve Sparks, President of IAVCEI, had announced that it would be good for the various IAVCEI committees to use the Bali conference as a meeting place, and review procedures and elect new committee officers. In a subsequent message, Minoru nominated JCV as a candidate to lead CVL, and at that time Sam Freeth objected to the procedure and to the general idea of a meeting in Bali. JCV communicated with Sam at that time about the details, but few (or no) others joined this discussion. JCV discussed with Steve McNutt (secretary of IAVCEI) the required procedures for IAVCEI committee activities, and he encouraged us to proceed as planned. So a formal CVL meeting was held, chaired by Minoru, with several agenda items (changes in structure, changes in Newsletter), ending with the nomination of candidates, a request for alternate candidates, and election of Alain

Bernard and Joop Varekamp. A meeting report was sent by Minoru to CVL members. About 35 people attended the CVL business meeting, and all IAVCEI protocols were observed. The CVL did not establish internal rules or regulations on how to change leadership and elect new officials, so in lieu of that Minoru adhered to the then available IAVCEI rules. We just received from Steve Sparks a general layout on IAVCEI committee procedures, which we will post on the CVL web site. This proposes as a general rule a maximum four-year term for committee leaders and rules for elections.

Another flurry of e-mails crossed through cyberspace today concerning the CVL web site. The beauty of the internet is its inherent freedom: everyone can put up a web site and show art, science results or opinions. The existence of one web site does not exclude the creation of others. To the contrary, simple links let all these sites flourish independently. We intend to use the CVL web site as a means of communication for CVL members, for informal result publication, and as a resource for CVL members. This does not mean that other volcanic lake web sites become redundant. Please read (once more?) the intro-page of the current JVGR Crater Lake volume, where Gary Rowe and JCV listed some available web sites with volcanic lake information (including those of Greg Pasternack, George Kling, the Wesleyan University site, and the formal IAVCEI crater lake site). We will develop a global volcanic lake catalog in the future as a research tool, with its own server, incorporating a searchable database, but of course it would not make other volcanic lake web sites superfluous. Boku Takano is compiling a photo-CD of volcanic lake images with summary info, and this is another beautiful initiative along the same lines. We hope that many more web sites, publications, photo books and videos on volcanic lakes will appear.

Before this message gets too long, we wish you all a successful semester (or term for those working in the UK-mode) and please communicate freely your opinions. As a last item, there are about 15 hardbound copies left of the "collectors edition" of the JVGR Crater Lake volume, which Gary Rowe and JCV sell at a cost price of US\$45— or EUR50—, including shipping. Order your very own copy now before the last one is sold (send an e-mail to JCV to order one).

Joop Varekamp (jvarekamp@wesleyan.edu)

Alain Bernard (abernard@ulb.ac.be)

IAVCEI SCHEDULE OF FUTURE MEETINGS

<i>Title of Meeting</i>	<i>Date</i>	<i>Contact</i>	<i>Contact Address</i>	<i>Phone and Fax</i>	<i>Email and Website</i>
IAVCEI "Cities on Volcanoes 2" Workshop, Auckland, New Zealand	February 12-18, 2001	Secretary	Cities on Volcanoes 2 Wairakei Research Centre Private Bag 2000 Taupo, New Zealand	Fax: (64) 7 374 8199	email: citiesonvolc2@gns.cri.nz website: http://www.gns.cri.nz/news/conference/cities.html
Penrose Conference Mammoth Lakes, California	June 7-12 2001	Kurt Knesel	Dept. of Earth Sciences University of Queensland St. Lucia, Brisbane, Qld 4072 Australia	Ph. 61-7-33659779 Fax: 61-7-33651277	email: k.knesel@earth.uq.edu.au
IAVCEI 1902 Centennial Workshop, Mount Pelee, Martinique	May 8, 2002	Jean-Louis Cheminee and Georges Boudon	Observatoires volcanologiques de l'IPGP Boite 89 4 Place Jussieu Paris Cedex 05 F075252 France	Ph: (33) 144272400 Fax: (33) 144272401	email: cheminee@ipgp.jussieu.fr volcanologiques@ipgp.jussieu.fr
XXIII General Assembly of the IUGG—Sapporo, Japan (IUGG2003)	June 30-July 11, 2003	Seiya Uyeda or Dr. Kiyoshi Suyehiro	Chairman LOC c/o Int'l Communications Specialists, Inc. (ICS) 2-7-4 Sabo Kaikan-bekkan, Hirakawa-cho, Chiyoda-ku, Tokyo 102-8646 Japan or General Secretary of LOC XXIII General Assembly Japan Marine Science and Technology Center (JAMSTEC) 2-15 Natsushima-cho, Yokosuka 237-0061 Japan	Fax: 81-3-3263-7077 Fax: 81-468-66-5541	email: iugg2003@ics-inc.co.jp email: IUGG_service@jamstec.go.jp website: http://www.jamstec.go.jp/jamstec-e/iugg/index.html
IGC Florence, Italy	August 16-26 2004	to be determined	to be determined	to be determined	to be determined

*** **FUTURE MEETINGS** ***

THE 2001 IAVCEI VOLCANO CALENDAR

ANAK KRAKATAU, INDONESIA Lécuyer Frédéric, PYROS sarl, France
UBINAS VOLCANO, PERU Anthony Finizola, Université Blaise Pascal, Clermont-Ferrand, France
MT. RUAPEHU, NEW ZEALAND John Gamble, Victoria University of Wellington, New Zealand
ARENAL, COSTA RICA Stephen and Donna O'Meara, Volcano Watch International, Hawaii
SOUFRIERE HILLS VOLCANO, MONTserrat, WEST INDIES Simon Young, Montserrat Volcano Observatory
ISLA SAN LUIS, BAJA CALIFORNIA, MEXICO Brian Hausback, California State University, Sacramento, California
MAYON VOLCANO, PHILIPPINES Jens Edelmann, Dresden, Germany
KILAUEA VOLCANO, HAWAII G. Brad Lewis, Omjalla Images, Hawaii
KILIMANJARO, TANZANIA Norman Kerle, University of Cambridge, England
OLYMPUS MONS, MARS Peter Neivert, Brown University, Rhode Island
PICO DE ORIZABA, MEXICO Katrin Hafner, Seimological Laboratory, California Institute of Technology
ANAK KRAKATAU, INDONESIA Bob Decker, Mariposa, California
SHISHALDIN VOLCANO, UNIMAK ISLAND, ALASKA Steve McNutt, Alaska Volcano Observatory, Fairbanks, Alaska

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2001

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2000-2001

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LAYOUT AND DESIGN BY JEAN CHIU,
ADMINISTRATIVE SECRETARY

CITIES ON VOLCANOES 2, AUCKLAND, NZ, FEBRUARY 2001