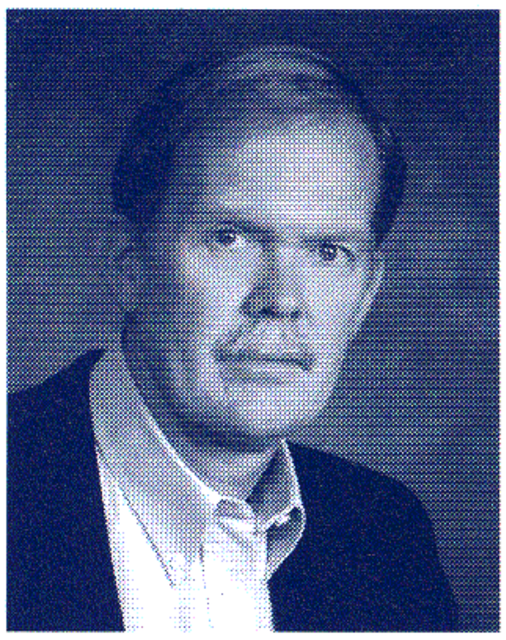
IAVCEI *News* 1997 No: 2

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

FROM THE PRESIDENT



Grant Heiken

150 YEARS OF VOLCANOLOGY

1922: 'Volcanologist' is the profession of a few dozen persistent, occasionally brilliant, and often eccentric individuals who divide their time between observations of live volcanoes and the chemistry and petrology of older volcanic rocks. Most of these scholarly studies are supported by universities, a few institutes, and some private foundations. Communications to journals are usually short; the preferred form of communication is a book. There is some speculation on global views of tectonics and magma genesis and almost nothing is known about volcanism under the oceans. Although they have minimal equipment and support, the contributions of these few pioneers of volcanology will be remembered 75 years later. Interest in volcanoes is event-driven, following tragic eruptions in the West Indies, Indonesia, and Italy.

1997: Interest in volcanoes is still event-driven; public and political interest increases briefly after the eruptions of Mt. St. Helens, El Chichon, and Pinatubo and during the run of several entertaining volcano movies. However, nearly everything else in volcanology has changed since 1922 - there are several thousand volcanologists, multi-disciplinary studies employ everything from physics to

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VOLCANOLOGY IN THE SPACE AGE
MONITORING VOLCANOES ON IO

When IAVCEI was founded 75 years ago, volcanology was truly an Earth Science. There was plenty of speculation about the craters on the Moon being volcanic in origin but, without any prospect of going there, it seemed unlikely that the truth would ever be known. The notion of volcanoes on other planets and moons must have seemed even more exotic. Io, a small moon of Jupiter, must have been one of the most unlikely contenders for planetary volcanism.

The beginning of the Space Age 40 years ago opened up many new research fields and the Moon missions in the 1960's and 1970's made lunar geology a thriving branch of science. The craters turned out to be of impact origin, as had already been proposed by many, but plenty of ancient volcanic features were found: lava flows hundreds of kilometres long, pit craters, collapsed lava tubes. Samples brought back by the Apollo astronauts tempted many petrologists away from their 'terrestrial' work. More missions followed - to Mars, Mercury, Venus - and it became clear that volcanism was one of the most fundamental processes in the evolution of solid bodies in the solar system. However, no active volcanism was found – the Earth seemed to be unique in this respect.

IAVCEI
CELEBRATING
75
years
1922-1997

In 1979, as the first of two Voyager spacecraft approached the Jupiter system, a remarkably well-timed paper was published in Science: Stan Peale and colleagues presented a model in which melting of Io's interior was caused by tidal heating, produced by the gravitational effects of Jupiter and Europa on Io. They calculated the heat generated by the tidal stresses to be substantially greater than that released by normal radioactive decay, and wrote that 'widespread and recurrent surface volcanism might occur'. A few days later, Voyager flew close to Io. The first images showed Io to be a truly bizarre moon with a vividly coloured surface totally devoid of impact craters - a sure sign of a very young surface. The discovery of active volcanism was not made by the science team but by a navigation engineer who noticed a volcanic plume standing out from the moon's limb. When more plumes were found, and Voyager's infra-red instrument, IRIS, showed enhanced thermal emission from areas coinciding with the plumes, there was no doubt left. Further analysis, and the fly-by of the second Voyager spacecraft four months later, showed the remarkable scale of Io's activity. Plumes reached 300 km in height, and surface changes over large areas occurred between the two fly-bys. A heart-shaped deposit around the volcano Pele, presumably formed by plume fallout, had become oval in shape, representing a change in surface area of over 10,000 km^2. There were many major questions about the type of volcanism on Io. Sulphur dioxide gas was detected over a plume, sulphur dioxide frost was detected on

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75 YEARS ! IAVCEI COMMEMORATIVE ISSUE

SHORT REPORT OF THE SIXTH FIELD WORKSHOP ON VOLCANIC GASES

The Sixth Field Workshop of the IAVCEI Commission on the Chemistry of Volcanic Gases was held at Kilauea volcano, Hawaii, from May 16 to May 20, 1997. Participants from Canada, Italy, Japan, Mexico, and the USA took part in fieldwork and scientific sessions organized by Jeff Sutton, Tamar Elias, and Don Thomas. Gas sampling was carried out at two fumaroles inside Halemaumau crater (W3 at 307° C, and W4 at 247° C), at Sulfur Bank (97° C), and at B-site on the rim of Halemaumau (96° C). Below some participants gather in front of the most important fumarole inside the Halemaumau crater.

The eleven scientific sessions included: 'Forecasting volcanic activity without sophisticated devices: experiences in geochemical surveillance' (M. Martini); 'Flux measurement of fumarolic gases from Kuju volcano, Japan' (G. Saito, K. Kazahaya, M. Yasuhara); 'Infrared remote sensing of volcanic gases using ground-based and satellite-based non-dispersive gas correlation radiometry' (H. William, J. Stix, R.W. Nicholls); and 'Convection degassing of high temperature rhyolitic magma chamber of Satsuma-Iwojima volcano' (K. Kazahaya, H. Shinohara, G. Saito).

One field excursion involved flying by helicopter to the flow front near the Pu'u O'o erupting vent.

Past and future activities of the Commission were discussed during the general meeting held in the evening of May 19: M. Martini, J. Hirabayashi, and W. Giggenbach were elected as leader, secretary, and editor, respectively. Satsuma-Iwojima was proposed as the site of the next Field Workshop in 2000.

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FROM THE PRESIDENT

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sociology, sophisticated monitoring equipment, age-dating, many types of isotopic analysis, global views from man-made satellites, studies of hundreds of sub-sea volcanoes, and substantial financial support from many nations and several international organizations. Volcanic databases now include images of and samples from volcanoes on other planets and moons. Communications and travel are swift. A broader based and more sophisticated approach of culture-based communication about volcanic risk has saved thousands of lives in one of the two largest eruptions of the century. These advances have also created a quandary - the more we learn, the more we realize how complex and individualistic volcanic systems are and how little we really know about them.

2072: Cities throughout the world have grown beyond all expectations and the cities near volcanoes maintain an uneasy truce with their dynamic terrains. City governments have taken responsibility for monitoring and educating the public about natural hazards. Hazard zonation has been overwhelmed by the demand for land, and civil authorities depend on accurate eruption prediction, public education, and evacuation drills to mitigate the hazards. Global monitoring of sub-sea eruptions has linked thermal effects from these eruptions to the origin of some El Ninos. Ancient pyroclastic deposits on the Earth's Moon serve as oxygen feedstock for industrial lunar colonies. With global monitoring of all active volcanoes located near population centers, most volcanologists work in control centers. However, a few delightful eccentrics still go to the field to make observations and to experience the thrill of volcanic activity. Signs of unrest at a large silicic caldera complex cause serious concern about the effects of an ash-fall that could cover half of a continent.

Techniques developed over the past 75 years have made it possible to predict activity and to maximize hazard mitigation...what would they have done to evaluate the potential effects of such an eruption in1997?

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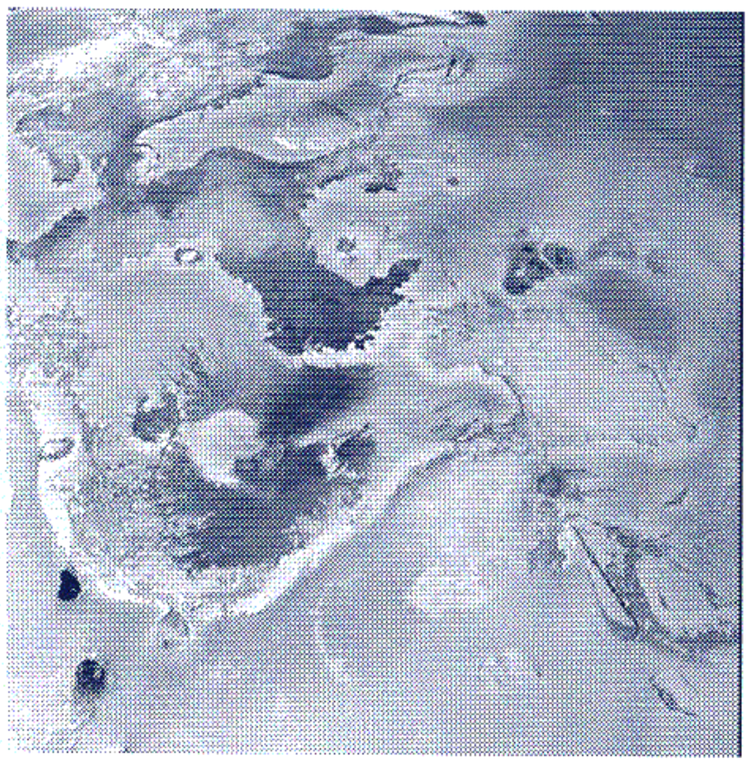
VOLCANOLOGY IN THE SPACE AGE

>>Continued from page 1:

spectra of Io obtained from the Earth-orbiting International Ultraviolet Explorer satellite, the colours of Io's surface pointed to a mainly sulphur composition, and the temperatures detected by the Voyager IRIS instrument were lower than 600 K – consistent with sulphur volcanism. However, Io's density, 3.5 g/cm^3, and surface relief – such as steep caldera walls – suggested a silicate crust.

A new mission to Jupiter, Galileo, was already being planned, but a series of frustrating delays meant that there would be a long interval between the Voyager observations and those by Galileo. During that hiatus – 17 years – astronomers started a new type of volcano monitoring program, using infra-red cameras mounted on telescopes to measure thermal emission from Io's volcanoes. The strongest evidence for silicate volcanism came from these observations, which showed temperatures of over 1000K. Several new 'hot spots' – areas of enhanced thermal emission that are thought to be active volcanoes – were discovered from the ground.



Io from the Galileo spacecraft

After a 6-year journey to Jupiter, Galileo finally arrived in December 1995. Weeks before the spacecraft was to fly close to Io, the on-board tape recorder, where data are stored before being transmitted to Earth, began to 'stick'. There was not enough time to understand the problem before the fly-by, so Galileo managers decided to scrap all of the remote sensing observations of Io. The spacecraft came within 900 km of the surface and did not obtain a single image or infra-red measurement. However, some experiments could transmit their data directly to Earth. The magnetometer detected a slight disturbance in Jupiter's magnetic field as Galileo flew past Io. The most likely explanation is that Io produces its own magnetic field. Radio tracking of the spacecraft as it came close to Io showed variations in telemetry due to the effects of Io's gravity on the spacecraft. Analysis of the signals can be used to model Io's interior. The results are truly exciting: Io has a large metallic core, probably made up of iron or a mixture of iron and iron sulphide. Prior to the Galileo fly-by, the Earth was the only body in the solar system known to have a metallic core. Given Io's intense volcanic activity, it is reasonable to suppose that the core is partly molten and may be circulating – which would support the results from the magnetometer experiment.

During the fly-by, the plasma science experiment detected a dense region of ionized oxygen, sulphur, and sulphur dioxide 900 km over the moon's surface. Io was known to have a thin, patchy atmosphere, but this result indicates that it may also have an ionosphere. It also supports the idea of 'stealth' plumes – gas-only volcanic plumes not seen in the visible part of the spectrum – that carry gases to great heights above the surface.

In July 1996, Galileo began its planned 11-orbit tour around Jupiter, during which it has not come closer to Io than 120,000 km. The images from Galileo's camera (SSI) and the infra-red images from the Near Infrared Mapping Spectrometer (NIMS) revealed that significant changes had taken place in the 17 years since Voyager. The improved technology in the solid state camera system has revealed Io's surface colours to be even more startling (some would say lurid) than was apparent before. Some areas are truly red, such as the 1,000 km wide aureole surrounding the Pele volcano. The composition of the material is still unknown; most likely it is a form of sulphur. It is known that the red colour fades with time, as it is present around the active or recently active volcanic centers. The large white areas, which are sulphur dioxide frost, have shown small changes in size and distribution during the last 17 years. NIMS spectral data show that condensed sulphur dioxide is present over much of Io's surface, but absent in volcanically active areas, where high surface temperatures lead to rapid vaporization. NIMS data, spanning the 0.7 to 5.2 micron region, are also well-suited to identifying thermal emission from hot spots. During the first six months of the mission, NIMS detected 16 hot spots that were not known from Voyager or ground data, and 13 others that were previously known. Many of these hot spots may represent persistent activity, as very few were seen to shut off between successive Galileo orbits (intervals of 2-3 months). Some were observed by Voyager 17 years ago, and may have remained active during all these years.

We can expect to learn a lot about Io's volcanoes by monitoring their activity until the end of the mission. Data will include the volcanic distribution, frequency of activity, temperatures, and plume heights. These data will reveal more about Io's interior, and about how the tidal interactions between Jupiter, Io, and the other Galilean satellites heat up Io's interior and produce the high rates of volcanism observed. The most exciting results will probably come at the very end of the mission. In 1999, after a two-year Europa-intensive mission (called the Galileo Europa Mission), the spacecraft will again risk flying through the harsh radiation environment near Io. Two close fly-bys of Io are planned, at 500 km and 300 km altitude. The second, over the south polar region, should give us the definite answer whether Io generates its own magnetic field. Best of all, we can expect infrared maps at a few kilometres resolution, spectra to study the surface composition at less than 1 km resolution, and images down to tens of meters per pixel. Given that the highest resolution images so far are at best 0.5 km/pixel, we do not know what the volcanoes will look like at the tens of meters scale. However, we know that we want to get a view right 'down the throat' of at least one of Io's volcanoes.

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INTERNATIONAL IDNDR CONFERENCE IN APRIL 1998, SANTIAGO, CHILE

IAVCEI and IASPEI are collaborating in co-sponsoring an International Conference in Chile on *Modern preparation and response systems for earthquake, tsunami, and volcanic hazards*. The Conference will be held from 27 to 30 April 1998 in Santiago and will highlight the ability of modern technology to lesson the risk in large urban and industrial areas from earthquakes, volcanoes and tsunamis. The official organisers are the IUGG Chile National Committee and the IASPEI Commission for the International Decade for Natural Disaster Reduction (IDNDR).

The Conference is being organised to ensure working interaction between scientific, engineering, government, business, and emergency-service professionals. The emphasis is on information dissemination and risk reduction. Themes include instrumental recording systems, data-acquisition technology, explosive volcanic eruptions and air navigation, rapid assessment of hazards in urban areas, real-time emergency response, rapid failure evaluation for critical structures and lifelines, early-warning satellite systems for volcanic and other hazards, interactions between scientists and emergency-management organisations, and the role of news media.

An International Program Committee has been established (Co-Chairmen are Bruce Bolt representing IASPEI and Wally Johnson representing IAVCEI) as well as a Local Organising Committee that includes well known IAVCEI figures such as Hugo Moreno and Oscar Gonzalez-Feran. Invited speakers are expected to include several high-profile people connected with IAVCEI.

For further information and the First Circular please contact: International IDNDR Conference, c/o IUGG Chile National Committee, Instituto Geografico Militar – Chile, Nueva Santa Isabel 1640, Santiago, Chile.

A SHORT HISTORY OF IAVCEI

This brief article is adapted in part from one by Gasparini & Johnson (1995; History of the International Association of Volcanology and Chemistry of the Earth's Interior. IUGG Chronicle 286, 68-72)

IAVCEI has a long history - seventy-five years, in fact! What we were in 1922 is quite different from what we are now in 1997, yet IAVCEI has maintained a common thread of commitment – namely, to one of understanding volcanic processes and mitigating their impact on society.

The following words appear in the IUGG (International Union of Geodesy and Geophysics) Year Book for 1997 (page 21): 'At the First General Assembly of IUGG (Rome, 2-10 May 1922), the Section de Volcanologie became one of the constituent sections of the Union. This name was changed into Association Internationale de Vulcanologie at the Fourth General Assembly (Stockholm, 1930). It took its present name [International Association of Volcanology and Chemistry of the Earth's Interior, IAVCEI] at the Moscow General Assembly (1971)'.

This quotation summarises our history, including the fact that we existed as a 'Section' even before IUGG was formally created. It also reflects the influence of both the French and English languages. This influence is present still in 1997 in that the Statutes and By Laws of IUGG and its seven constituent Associations (given in the Comptes Rendu of the Union) are provided in both the English and French.

IUGG was organised into six scientific sections at the 1922 General Assembly of the Union. Alfred Lacroix (France), Henry Washington (USA), and Alessandro Malladra (Italy) share the honour of organising the Section on Volcanology. Their first action was to form an international bureau (Bureau Central International de Volcanologie). The main tasks of the Bureau were to (1) inform by telegraph the national committees of the onset of important eruptions, (2) establish a central international volcanological library, and (3) publish a Bulletin Volcanologique and a bibliography of all aspects of volcanoes, from their activity to description of their products.

Lacroix proposed that the Bureau be established in Italy and, after some lively discussion concerning the relative merits of Napoli and Catania, the former was selected on account of its being the seat of a large university and being a more accessible city. In addition, a decision was made to establish two sections of the international bureau, including the international library, in Catania and Hawaii. Information on submarine volcanic activity was needed badly and at the same 1922 meeting the Section of Volcanology invited the military and mercantile Navies of all countries, as well as companies exploiting submarine telegraphic cables, to provide the Central Bureau of Volcanology in Napoli with information regarding submarine eruptions and the breaching of telegraphic cables.

Lacroix was the first of 15 formally appointed IAVCEI Presidents, although he was preceded by A. Ricco . A survey of the countries represented by the IAVCEI Presidents since 1922 reveals, in broad terms, the political history of the IUGG over the past 75 years:

- The first 41 years (1922-1963) were dominated by Europe, until the presidency of H. Kuno (Japan, 1963-1967)
- Then there were 16 years of alternating Presidents from the USA and USSR (1967-1983)
- Finally, since 1983, 16 years (1983-1999) of Presidents from different countries – a reflection of the global approach to volcanology and studies of the chemistry of the earth's interior.

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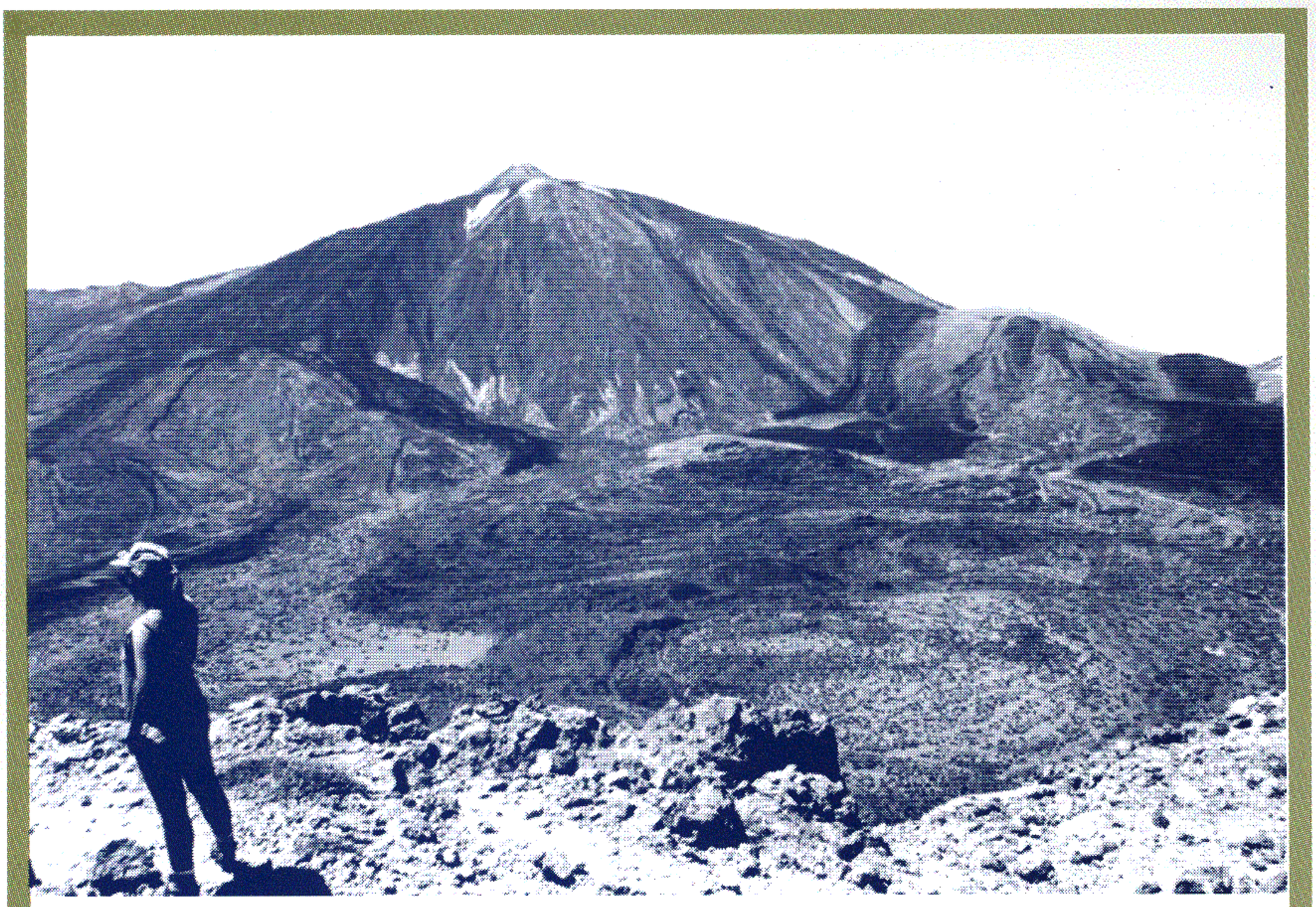

DECADE VOLCANO, EL TEIDE, a phonolitic 3,718m high, stratovolcano that has grown in the caldera at the summit of the Las Canadas edifice, a 3-4 Ma phonolitic and basaltic lava and pyroclastic shield, that is itself developed on the remains of an older basaltic lava shield system of Tenerife. Tenerife is in the Canary Islands, which is a chain of oceanic, intraplate shield volcanoes off the northwest coast of Africa. The highest point on the Las Canadas caldera rim, Guajara peak, at 2,700m is the ledge in the foreground, 700m above the caldera floor. The caldera floor has been filled by post-caldera lavas and minor pyroclastic deposits from El Teide and two parasitic centres, Pico Viejo (not visible; to left of Teide), and Montana Blanca, forming the lower shoulders of the Teide edifice on the right. The dark lava lobes are phonolitic aa lavas erupted during the summit cone (El Piton) forming eruptions of Teide in 1492 AD (?), and the sub-plinian explosive and lava forming eruptions of Montana Blanca 2020 years b.p.

Ray Cas

VOLCANOES, DISASTERS, AND EDUCATING THE PUBLIC

It is fair to say that there's no question in anyone's mind that natural disasters, particularly volcanic eruptions, are a way of life about the world. Volcanoes are going to erupt and natural disasters are going to occur, even though not, in most cases, with great frequency. This fact is both fortunate and unfortunate. The fortunate portion is that the victims are kept to a minimum and persons are inconvenienced less, and less property is damaged and/or lost than if volcanic disasters occurred with relative frequency. It is unfortunate in that because volcanic disasters do not occur with a great frequency, and people tend to be unconcerned, or otherwise forget about their consequences. It has been shown by many sociologists, scientists, and others, that at all levels of government, particularly in third world countries, there is not much being done in the way of educating the populace about the dangers of volcanic eruptions as perhaps should be done.

One of the problems that has been found in a Southwest Volcano Research Centre's (SWVRC) study, relative to the formula typically used in disasters, is that 'risk equals probability times the consequences'. In SWVRC's quest to forecast volcanic eruptions as accurately as possible, it has been found that if the probabilities are low, even though the consequences of an eruption may have great consequences, the risk is perceived to be low, and vice-versa. In some cases, adequate warnings of impending volcanic eruptions have been provided, but the general populace has chosen to ignore those warnings. The 1985 eruption at Nevado del Ruiz, Colombia, and the 1902 Mont Pelee eruption, Martinique, French West Indies, are examples that illustrate this tragic point.

The ability to forecast eruptions has met with both some success and failure and the responses to those forecasts has also brought up some interesting considerations of both social disruption and risk. These disruptions and risks will

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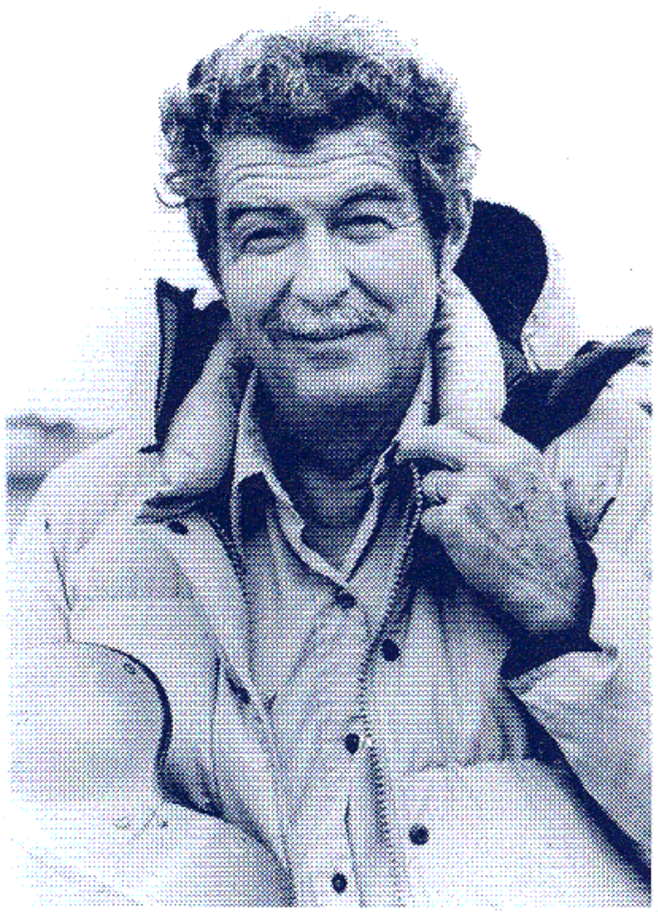
BOB DECKER REMINISCES



Bob was President of IAVCEI from 1975 to 1979.

On my first sabbatical from Dartmouth in 1959, I signed up for a teaching assignment in Indonesia. At that time my main interests in geology were geophysics and structural geology — the pillow lavas in Hanover, New Hampshire, are Ordovician.

Bandung, the location of the teaching job at the Institut Tecnologi, is on the slopes of one volcano and across the valley from several others. Java looks like it is nailed to the Earth with dozens of giant volcanoes. You can't live in Indonesia without getting interested in them. The clincher was a expedition to Anak Krakatau (child of Krakatau). We took along a portable seismograph and set it up on the island, and then climbed to the rim of the crater. Small explosive eruptions were occurring every few minutes. Standing there, one of my American colleagues said "Bob, doesn't this remind you of hell?" Before I could answer, Rubini, an Indonesian colleague answered "Oh you Americans, you've gone everywhere."

A larger explosion sailed some big blocks over our heads, and we retreated to the relative safety of the seismograph location. By studying a sequence of eruptions we determined that the first seismic waves always preceded the onset of an explosion by several seconds; the same interval each time. This delay corresponded well with the depth to the submarine caldera rim before Anak Krakatau grew over it, so our interpretation was simply that a pulse of magma had reached the porous base of the pyroclastic cone and started a new hydromagmatic steam explosion.

I was happily hooked and I have been studying volcanoes ever since. To me volcanoes are great outdoor laboratories where geologists, physicists, chemists, and biologists can study many aspects of volcanoes' complex nature, share their results, and all be the richer for it. I soon discovered that in the United States the American Geophysical Union provides a good forum in which to document and exchange ideas about active volcanoes, and that on an worldwide level, IAVCEI serves a similar function. I attended several IUGG and IAVCEI meetings starting in the early 1960s, and held a couple of appointed editorial jobs with IAVCEI. I did not attend the IUGG meeting in France in 1975, so being elected President came as a complete surprise.

My perception of that election based on gossip and reading between the lines (and remember that perception sometimes is, and often is not, reality) is that a palace revolt took place at that meeting. The loyalists and the rebels were not about to vote for their opposing candidates, so Decker, the unknown devil, slipped in. Well, why not give it a try?

Meetings in Durham, Tokyo, Hilo, and Canberra followed, and volcanology began to swing from a descriptive science to a more interpretive one. What, when, and where, began to be supplanted by how. Two of my favorite topics received more interest — the relationship between volcanoes and plate tectonics, and forecasting volcanic eruptions. Any merits to the governance of IAVCEI during 1975 to 1979 go equally to Peter Baker, Ian McDougall, and me. We ran the association by consensus and lots of correspondence — the old kind, letters. Any demerits, and I'm sure there were, go only to me.

After 25 years at Dartmouth I joined the U.S. Geological Survey as Scientist in Charge of the Hawaiian Volcano Observatory (HVO). When Mount St. Helens erupted in 1980, many staff members from HVO participated in the monitoring and analysis. We did what the local sheriff whose territory included Mount St. Helens colorfully described as "We were building a boat and rowing it at the same time."

There has been great progress in understanding how volcanoes work during the past 20 years. That's both the good news and the bad news. Along with increased study comes more scientific literature. Until about 10 years ago, I could pretty well keep up with all the English-language literature about active volcanism, but not any more. Of course as the literature volume was rising, my brain was shrinking. One thing that might help would be to publish more review papers.

Barbara Decker and I have been writing popular but honest books and columns (we *hope* both honest and popular) about volcanoes since 1977. It's productive and enjoyable to work together, and we think we are doing a useful service to the science of studying volcanoes. Without public interest, understanding, and support, no branch of science will prosper and advance. We encourage all of you to consider contributing ideas and articles to magazines like *National Geographic* and *Earth*. Along this line, I would like to remember Katia and Maurice Krafft, who did so much to bring the wonder and mystery and understanding of volcanoes to a worldwide audience.

In closing (this article; I'm not done yet!), I want to thank all my colleagues and students who have made my studies on active volcanoes good fun and, I hope, good science.

Bob Decker
Kawaihae, Hawaii, July 8, 1997
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NEWS FROM THE COMMISSION ON VOLCANIC SEDIMENTS (CVS)

The bulk of a volcano's production is distributed far and wide as volcanic sediment, sometimes virtually monomict, as in fall tephra or ground-hugging ignimbrite, and sometimes polymict, as in river-transported materials. The photograph shows the recovery of an interesting bi-modal volcanic sediment from a depth of 8.5 km on the inner slope of the Kermadec Trench at about 31°S. The vitric mud is composed of pure rhyolitic glass and is derived from the Taupo Volcanic Zone of New Zealand, which is located between latitudes 38 and 39°S, about 750 km distant. The enclosures in the rhyolitic mud are clasts up to cobble size of basalt, derived from the adjacent Kermadec Arc. The two components have been mixed during debris flow activity on the steep (20°) lower trench slope.

First results from the Mariner lander on Mars show a rocky desert surface with obvious blown sand accumulations and evidence of major floods, while analysis of the rock Barnacle Bill suggests a composition corresponding to andesite. Clearly, new horizons are opening up for volcanic sediment studies.

The Commission comprises nearly 200 members representing 25 countries, both western and developing. Through newsletters, sponsored field workshops and conference symposia, the group strives to keep members appraised of the newest developments in volcaniclastic sedimentation, and to foster discussion and debate on topics of interest. We have realised that our newsletter is an important forum for those scientists unable to attend international meetings and workshops.

Upcoming meetings and workshops sponsored by CVS will include a field excursion to the Central Mexican volcanic zone as part of the 1997 Geological Society of America meeting, and workshops being planned in the Central Andes, western North America, and perhaps Italy. CVS will co-sponsor a symposium at the July 1998 IAVCEI congress in Cape Town, South Africa, on Peperites, and a related field trip to the Karoo province.

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Co-leaders, CVS

Bimodal volcanic sediments from the Kermadec Trench

PAOLO GASPARINI - MEMORIES OF MY FIRST ENCOUNTER WITH IAVCEI

For many of my generation, the first IAVCEI (IAV at that time) meeting we attended was at the IUGG General Assembly held in Berkeley, California, in August 1963. I arrived at Berkeley a couple of days before the beginning date, and I was housed in the campus of the University. On a sunny Sunday afternoon, while I was preparing outdoors the presentation of my paper, I was approached by a massive Russian and a tiny dark Japanese.

"Are you Spanish?" the Russian asked me.

"No, I am Italian" I answered.

"Wonderful. I am Valeri Beloussov and he is Hisashi Kuno. We have to translate a part of our tomorrow speeches to Spanish. Italian and Spanish are very similar. I am sure you can do the work."

"I am sure I cannot. I do not know a single word of Spanish" I protested.

A long debate followed until I looked at my watch.

"It is a desert here on Sundays" Beloussov said, "where are you going?"

"To a famous jazz spot in San Francisco. It is named Earthquake Mc Goons." "Earthquake? It is very proper for us. We are coming with you. Are you sure you know where it is?"

"Yes, I am"

I am not sure that Kuno was happy to come with us. He had been completely silent and appeared quite dubious.

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The Geological Society of America Penrose Conference in June 1998 - 'Evolution of Ocean Island Volcanoes' will be held in the Galapagos Islands, Ecuador - APPLICATION DEADLINE IS 1 JANUARY 1998 ...

IAVCEI AND EASTERN EUROPE

I wonder how many volcanologists know where the rock-name *dacite* comes from. And how many would be surprised to hear about volcanoes in the Carpathians active tens of thousand years ago, one of them still preserving a picturesque crater lake. Who remembers that a successful International Volcanological Symposium was hosted in Bucharest in 1973? The understandable ignorance is a measure of the isolation of Eastern European countries from mainstream science world-wide, specifically of Eastern European researchers from the international volcanological community, during the last stages of communist regimes in most of these countries. A lack of professional contacts, an absence from international meetings, poor research infrastructure, and a lack of leading professional journals in the libraries all contributed to the overwhelming feeling of frustration and despair among many Eastern European scientists.

Things got better immediately following the turnover of the communist regimes. The IAVCEI Congress in Mainz was unprecedentedly well populated with Eastern European researchers, thanks to massive support by the local Organising Committee. Networks of personal contacts developed, resulting in numerous more or less formal cooperation projects. A number of Western scientists started to 'rediscover' Eastern Europe. All of us expected that in a few years our countries would be able to recover enough economically to sustain science at higher funding levels and that this would allow us to take our place in the international scientific community. Unfortunately, the last 7 years have not fulfilled these optimistic expectations. Economic reform has not been accomplished and most Eastern European countries face severe crises affecting their scientific life. Ever decreasing living standards (a contract researcher in Romania earns less than US$100 per month), along with an apparent decrease in financial support from the international scientific community, results in a renewed feeling of frustration and isolation among many Eastern European scientists.

In spite of these difficulties, we are striving to maintain our high professional standards. Although many of our friends from the Western world sympathise with us and appreciate our efforts, many others seem to ignore us. For example, at our joint CEV and CVS workshop in Romania last year, which benefited from IAVCEI sponsorship for which we are grateful, there was a very poor attendance from the non-Eastern Europeans.

Eastern European volcanologists are eager to be involved **Continued on page 11:>>**

MEMORIES OF MY FIRST ENCOUNTER WITH IAVCEI

>>Continued from page 7:

Paolo Gasparini
IAVCEI Past President

Beloussov was not such a man to allow for uncertainties, so the three of us went to San Francisco. On the way to the town Beloussov and Kuno started to discuss plate tectonics. Beloussov was a strong opponent of the theory, and Kuno was in favour, although I am not sure he was very convinced. The discussion went on the whole evening. I must say it was rather a soliloquy of Beloussov, interrupted by short, very sharp, comments by Kuno. I was very impressed by the amount of information in the various fields that both appeared to manage.

That night I learned also of the Upper Mantle Project, the first large thematic project in Earth Science which had been promoted by IUGG, with Valeri Beloussov having being one of the founders. Not everybody was favourable towards the project. Many people were afraid that it might overcome the Associations, focusing too much the activity to just one objective, and inhibiting free research. I remember entering the conference room where I gave my paper, and seeing a giant UMP ogre eating all the IUGG associations drawn on the blackboard. The paper I presented was outside these global paths, being on the radioactivity of Mount Vesuvius products. It showed that the very high radioactivity of these products (observed since early in this century) was due to a very large excess of 226Ra over the equilibrium concentration with 238U. This problem was approached again and settled five years later by Paul Gast and Virginia Oversby in a EPSL paper well known to the specialists.

To me the star of the IAVCEI sessions was Alfred Rittmann. I had known him a couple of years before at Ischia, and I was very honoured by the attention he dedicated to me, although I belonged to the field of his "enemy" Giuseppe Imbò. Rittmann was President of IAVCEI (1954 - 63)and he was very angry with the Union Bureau who wanted to give a marginal role to volcanology, considering it 'the science of the smoking plumes'. I remember Rittmann quoting his answer to the Bureau: 'We study the whistle to understand how the whole engine works'.

Before the opening ceremony of the 1995 IUGG General Assembly, at the theater of the University of Colorado at Boulder, Helmut Moritz, Chris Harrison, Don Williams and myself were recalling the Berkeley Assembly, which was the first for all of us, and how it was very important for the future that we now have it behind us. For me it was very exciting to span through different areas of geophysics in a few days, just walking through the campus. I believe that there I got the first feeling of the tight bonds that exist between the study of volcanoes and geophysics.

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VOLCANOLOGICAL RESEARCH ACTIVITIES IN JAPAN

History and activity of the Volcanological Society of Japan

The Volcanological Society of Japan (VSJ) was established by a group of geologists in 1932, after large eruptions at Bandai in 1888, Sakurajima in 1914, and Komagatake in 1929. Following a dormant period during and after World War II, a group of geophysicists, geologists and geochemists who were active in the study of volcanoes, decided to create 'the Study Group of Active Volcanoes' (later, 'Study Group of Volcano Physics'), stimulated by the eruptions of Miyakejima (1940), Showa-shinzan (1944-45), and Izu-Oshima (1950-51).

The VSJ was re-organised in 1956, being conscious of the necessity of cooperation with IAV (the forerunner of IAVCEI). The scope of VSJ is to develop volcanology and the sciences related to volcanoes. VSJ membership has increased steadily from 390 in 1966 to 1200 in 1996. The present membership profile is: university staff (including graduate students) = 43 %, companies = 18%, national institutes = 15 %, teachers and local government employees = 12%, and others = 12 %. Most members (52%) are active in their 30s and 40s, 18% are in their 20s and 14% are over 60. VSJ members have served as IAVCEI presidents and vice-presidents: Hidezo Tanakadate as Vice-President in 1933-36, Hisashi Kuno as President in 1963-67, Takeshi Minakami as Vice-President in 1971-1975, Izumi Yokoyama as Vice-President in 1980-83, Daisuke Shimozuru as Vice-President in 1983-87, and Shigeo Aramaki as the President in 1987-91.

The first-series bulletin of the society was published in May 1932 and the publication continued until April 1940. The second-series of the 'Bulletin of Volcanological Society of Japan' (BVSJ) has been published since 1956. The 'Bulletin of Volcanic Eruptions' has also been published by VSJ since 1961 jointly with IAVCEI. Scientific meetings are held twice a year and in 1962, the VSJ hosted the IAV symposium on two subjects, 'Prediction of time and place of volcanic eruption' and 'Relation between magmas and nature of volcanic eruption'. The 1981 IAVCEI symposium was also hosted with the themes of 'Physics and chemistry of arc magma', 'Arc volcanism in time and space', 'Geothermal and energetic aspects of arc volcanism', and 'Prediction, hazards and environmental aspects of volcanic activity'. VSJ also co-sponsored international meetings such as the Kagoshima International Conference on Volcanoes (1988) and the International Workshop on Volcanoes, commemorating the 50th anniversary of Mt. Showa-shinzan (1995). Educational lectures on volcanology and volcanic eruptions for the public are held during the Autumn meeting. Active working groups at present are (1) volcanic hazard and (2) historical volcanic eruption based on the ancient documents. The results of research by VSJ members, together with information on volcanic activity in Japan, are summarised in 'Reports on Volcanic Activities and Volcanological Studies in Japan', published every 4-years jointly with the National Committee of Volcanology and Chemistry of the Earth's Interior (NCVCEI). These are distributed at each IUGG meeting.

Organization and projects

NCVCEI is a correspondent organization to IAVCEI, and belongs to the Science Council of Japan, Ministry of Education, Science, Sports and Culture. Its main function is to facilitate communication, and cooperation between Japanese volcanologists and relevant government agencies. The committee supports the National Project for Prediction of Volcanic Eruptions, various 'International Decade for Natural Disaster Reduction' (IDNDR) programs and international training courses, volcanology, the organization of symposia on eruption prediction and publication of national reports.

The National Project for Prediction of Volcanic Eruptions was established in 1974, and involves the Japanese Meteorological Agency, The Hydrographic Department in Maritime Safety Agency, The Geographical Survey Institute, The Geological Survey of Japan, The Institute for Earth Science and Disaster Prevention and 11 university departments. A 5 year rolling plan has evolved for volcanic eruption prediction. Eighty-three active volcanoes in Japan are divided in this project into three categories based on the intensity of activity, where 'active' is defined by an eruption in the last 2,000 years: (a) Thirteen volcanoes with first priority for observation and research; (b) twenty-three volcanoes with potential of future eruptions; and (c)

Mt Fuji: culturally Japan's most significant volcano

other volcanoes. These volcanoes have been observed and researched by using various geophysical, geochemical and geological methods. The current plan (Fifth 5-year plan, fiscal 1994-1998) includes four aspects: (1) expansion and reinforcement of observation and research, (2) promotion of fundamental research on eruption mechanisms, (3) development of prediction methods and techniques, and development of fundamental data base, and (4) development of organizations. The fundamental research includes a controlled-source seismic experiment to elucidate magma chamber-conduit systems under volcanoes and the surrounding crustal structure. Small, data-logger units with high performance were successfully developed for this purpose. Seismic experiments using more than 200 data-loggers and 6 artificial explosions were conducted at Kirishima and Unzen volcanoes in 1994 and 1995, respectively, and will be carried out at Kirishima (1996) and at Bandai (1997). To understand the background volcanic activity and to accumulate a base-line data set in a quiescent period, comprehensive geophysical and geochemical studies are carried out each year at one designated volcano by all the participants in the project.

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VOLCANOLOGICAL RESEARCH ACTIVITIES IN JAPAN >>Continued from page 9:

The Coordinating Committee for Prediction of Volcanic Eruption issues official comments on activity if necessary. The working groups of this committee are assembled to promote special topics. Presently, these include long-term prediction of eruptions, nomination of active volcanoes, and volcanic information.

The Japan International Cooperation Agency established a training course in volcanology and volcanic sabo engineering in 1989, responding to the IDNDR and the proposal at the Kagoshima International Conference on Volcanoes in 1988. The training program has been arranged and conducted by the Public Works Research Institute in cooperation with volcanologists. The course includes 4 months of courses and 2 months of individual research at volcano observatories in universities and institutions. Trainees are persons engaged in volcano monitoring or volcanic sabo engineering in developing countries. In 1995, there were 82 trainees from 20 countries attending the course.

Recent volcanic activity and researches.

In the last ten years, large eruptions at Izu-Oshima (1986) and Unzen (1990-95) have occurred in Japan, while Sakurajima, Aso, and Suwanose-jima volcanoes have maintained a high level of activity. In addition, small eruptions took place at Meakan-dake (1988), Tokachi-dake (1989), Aso (1993), Kuju (1995-96), and Hokkaido-Komagatake (1996) together with submarine volcanoes at Izu-Tobu (1989) and Fukutoku-okanoba (frequently-1996). The most tragic volcanic event in Japan during this decade took place at Unzen where forty-three people including Maurice and Katia Krafft, and Harry Glicken were killed by pyroclastic flows in 1991 and one person was killed in 1993. All of them were within the evacuation-requested area at the time. In exchange for this tragedy, the long-lasting eruptive activity at Unzen brought us huge amounts of new knowledge on lava dome eruption and volcanic disaster. Activity at Unzen was monitored and investigated in detail using wide-ranging methods by many research groups including the Shimabara Earthquake and Volcano Observatory, the Joint University Research Group and various national institutes and agencies. The VSJ members played significant roles within each research group. Their suggestions and advice, based on daily monitoring and observation, and their educational lectures for the public and civic authorities succeeded in developing successful emergency plans and the mitigation of further disaster.

The Unzen disaster forced the civic authorities to complete hazard maps for Japanese active volcanoes promptly. Many VSJ members began to take active parts in these projects. The VSJ encouraged its members to propose a nationwide research program to the Ministry of Education. As a result, a three-year research grant on 'magmalogy' was funded by the Ministry of Education in 1993. This program involved about seventy VSJ members and focused on the generation and behavior of magmas and their role in the evolution of the Earth. This nation-wide scientific program was closed successfully in 1996, and some of the scientific results will be published in a special volume of BVSJ in 1997.

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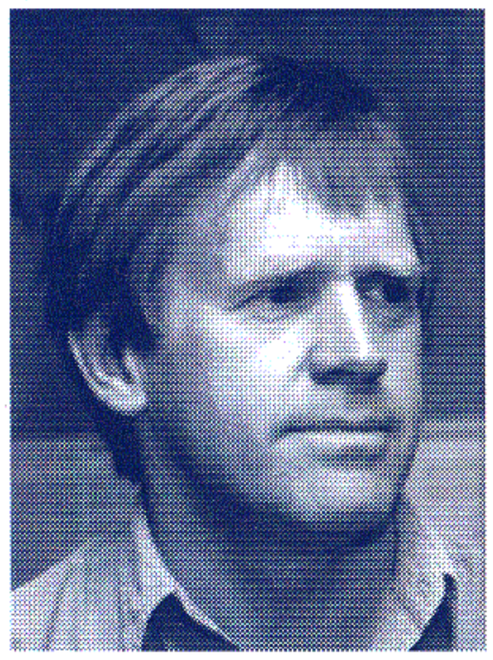
URL: http://hakone.eri.u-tokyo.ac.jp/kazan/VSJ1E.html.

FROM THE SECRETARY GENERAL



Wally Johnson

NOMINATING COMMITTEE, ELECTIONS, AND THE NEXT SECRETARY GENERAL

1999 will soon be on us - our 77th year! This is when we must vote for a new IAVCEI Executive Committee for the 1999-2003 quadrennial using the 'rules' established when the new IAVCEI Statutes and By Laws were approved at the 1995 IUGG General Assembly in Boulder, Colorado, USA. You should have received your personal copy of the Statutes and By Laws when you became a member of IAVCEI and so there is no need to repeat the details here. ***Please re-read them, however, in order that***
(1) you understand the postal system of nominating and voting for candidates, and
(2) so that you can impress on your own National VCEI Committee the importance of giving serious 'group' consideration to the kind of leadership you would like to see take us into the 21st Century.

Nominations and voting procedures will be supervised by an independent **Nominating Committee**. We are pleased to announce that Professor Shigeo Aramaki of Japan has accepted the invitation to be Chair of the Nominating Committee. Professor Aramaki was IAVCEI President from 1987 to 1991 and he continues to be one of the great advocates for the Association and its aims. The next step in the voting process will be to establish the Nominating Committee itself, so don't be surprised if you get a letter of invitation in the mail!

May I take this opportunity of stressing the importance of us selecting the right person to take over my current position – that of Secretary General. This is a key position in the affairs of IAVCEI, especially now because the job comes with the additional responsibilities of managing personal membership and of designing and printing IAVCEI News. Thus, the person will be running the **IAVCEI Secretariat** that will have to be transferred from Canberra to the host institution (or home) of the new incumbent.

The position of IAVCEI Secretary General is enjoyable and very satisfying. I can recommend it! It provides, particularly, a wonderful and privileged overview of the international landscape of VCEI activities. But it is an increasingly demanding responsibility. It easily could be a full-time job and, indeed, *should be* so in order that the Secretary General has opportunity to be as proactive as possible. One critical aspect of choosing the next Secretary General, therefore, is whether the person will have the *time* to take on the task. Please believe me when I say that being Secretary General will cut into your personal research time. Your e-mail, fax, and telephone intakes will escalate. You will have to respond quickly to many issues in many parts of the world.

Some IUGG Associations deliberately look for a person who is retired or semi-retired to be their Secretaries General and there certainly are advantages in this approach when it comes to having time to do the job. Such a person, of course, then does not become 'retired' any longer – nor do they get *paid* for coming out of retirement.

These comments are not meant as a discouragement, but rather to ensure that any interested candidates understand the real situation of the challenging - and satisfying! - position they will be taking on. Please think carefully about the Secretary General position when you come to select candidates and vote for the 1999-2003 Executive Committee.

Wally Johnson
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IAVCEI AND EASTERN EUROPE

>>Continued from page 8:

in international research projects as well as in the organisation of IAVCEI activities in their countries. The introduction of personal membership facilitates this; a popularising campaign in Romania resulted in 17 IAVCEI members recruited in one year, in a conscious effort to sustain IAVCEI initiatives within the local scientific community. The new IAVCEI members set up the Romanian IAVCEI Committee under the aegis of the Romanian National IUGG Committee. Furthermore, introduction of personal membership encouraged us to take the unprecedented initiative of democratically electing the National IAVCEI Correspondent from among our IAVCEI members to replace the previously appointed inactive National Correspondent, who is not even an IAVCEI member. A Bureau of three members coordinates and popularises IAVCEI activities in Romania, including the gathering and transfer of membership fees to the IAVCEI Secretariat.

IAVCEI can become increasingly involved in assisting volcanologists from Eastern Europe in a number of ways. For example, to encourage publication of research results, IAVCEI could appoint an Eastern European editor for its official journal, Bulletin of Volcanology. IAVCEI members from these countries could be appointed in the future to serve as IAVCEI officials. Preferential financial support for Eastern European scientists would ensure a more balanced international representation at IAVCEI meetings. Membership fees could be further reduced for the poorest (those for example, with less than US$ 2,000 annual income). Free membership for Eastern European and third-world students could be introduced. A special IAVCEI fund to assist Eastern European volcanologists could be raised. These are just a few ideas - but there are many other ways in which Eastern European volcanologists could be embraced into the IAVCEI community.

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VOLCANOES, DISASTERS, AND EDUCATING THE PUBLIC

>>Continued from page 5:

certainly occur in the future. Volcanic disasters that will inevitably occur in the future may be far worse than ones of earth's historical past. Since civilisation began, the earth has not experienced one of the really large volcanic eruptions that we know have occurred in the past. The only known relatively recent historical eruption that has emitted more than 1,000 cubic kilometres of magma at the Toba Caldera about 75,000 years ago in Indonesia. It is inevitable that such an eruption will most likely occur again sometime and somewhere on the earth. It is not a matter of if; it is only a matter of when. We must try to prepare not only for this eventuality, but certainly the lesser, but nevertheless, just as potentially deadly and catastrophic eruptions.

I thoroughly agree with the statements made by Fernando Munoz and Andrew Lockhart when they stated in their article 'International workshop on communication between volcanologists and the community' (referring to the WOVO workshop in Popayan, Colombia) that 'Close cooperation among the three elements of the local residents, disaster officials and scientists is the foundation of an effective disaster plan. From some unnoticed cut-off or lack of preparation, a natural disaster could grow into man-made disaster with widespread deaths and injuries. To maintain lines of communication, the securing of a system of emergency information communication and determining the role of mass media is very important. Moreover, for the sake of local residents, the role of education was especially noted. In particular, for the sake of the children who will be living in the future, it is necessary to make them well informed with correct information about local history and the volcanoes'

The technology and science already exist to provide adequate warnings to the general populace and is done to a great extent today, although imperfect, of future volcanic eruptions over both the long (years) and short term (days to weeks) periods. SWVRC's eruption forecasting programme 'ERUPTION' strives to achieve and provide the long term warnings. It, like current short and long term eruption forecasting, is not perfect. Education of the general public must occur also. The general public must be aware and take heed. These warnings will be of little value if not clearly understood by government officials and the news media in general. It is imperative that much of the understanding of volcanic eruptions and their consequences exist before the next crisis occurs. Volcanic risk can be minimised. Currently, the main problem seems to be establishing cooperation between volcanologists, government officials, and the news media all of whom are likely to be involved in eruption crises. Further, the general populace at risk must be educated about the dangers from volcanic eruptions and how those risks can be reduced.

SWVRC intends to participate and contribute, to the extent possible, in an education programme geared at educating the general public about the real nature of volcanoes, the risks and consequences of living near them. SWVRC will start at home by offering free to low-cost presentations to school educational systems and other groups. No one who happens to live near a volcano, wants to be constantly dwelling on the inherent dangers therein, but it is imperative that one plans for the worst and hopes for the best.

R. B. Trombley
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A SHORT HISTORY OF IAVCEI

>>Continued from page 4:

OUR PRESIDENTS:

IAVCEI's origin in Europe:

1919-1922 A. Ricco (Italy)
1922-1927 A. Lacroix (France)
1927-1933 A. Malladra (Italy)
1933-1936 C.A. Ktenas (Greece)
1936-1948 A. Michel-Levy (France)
1948-1954 G.B. Escher (Netherlands)
1954-1963 A. Rittman (Switzerland/Italy)

Break with European Tradition:

1963-1967 H. Kuno (Japan)

Alternating Superpowers:

1967-1971 G.A. Macdonald (USA)
1971-1975 G.S. Gorshkov (USSR)
1975-1979 R.W. Decker (USA)
1979-1983 S.A. Fedotov (USSR)

Wider World:

1983-1987 I.G. Gass (UK)
1987-1991 S.A. Aramaki (Japan)
1991-1995 P. Gasparini (Italy)
1995-1999 G. Heiken (USA)

Wally Johnson
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A MESSAGE FROM THE SECRETARIAT

Happy 75th Anniversary IAVCEI! Membership is strong, nearly 700, and growing steadily. I can testify to the vitality and enthusiasm of IAVCEI members who certainly keep the Secretariat 'on its toes'. Many thanks for all your contributions to this commemorative issue.

IAVCEI is working with Springer-Verlag, the publishers of the 'Bulletin of Volcanology' to more clearly define our relative responsibilities. Remember to include a photcopy of your IAVCEI membership card when ordering subscriptions of the 'Bulletin' from Springer (address page 5 margin). Yes, while you are IAVCEI members you do get the 'Bulletin of Volcanology' at reduced cost. Please continue to send IAVCEI membership enquiries to me at the Secretariat.

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