

IAVCEI *News* 2004 No: 3

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

FIELD EXCURSION TO SOCOMPA VOLCANO, CHILE AND ITS FAMOUS DEBRIS AVALANCHE DEPOSIT

Collapsing volcanoes and their spectacular debris avalanche deposits are an area of growing interest in volcanology as demonstrated by a major session dedicated to the topic at the recent 2004 IAVCEI General Assembly in Pucón, Chile. After the General Assembly and the short post-conference courses and trips, 14 participants gathered in Antofagasta, in northern Chile, on the evening of 22nd November for an informal (i.e. not a planned IAVCEI post-conference trip) field inspection of the famous Socompa debris avalanche deposit (DAD). We received considerable help from Minera Escondida, the company that oversees mining at the huge Escondida porphyry copper deposit which lies between Antofagasta and Socompa. In fact, the company extracts water from the basin in which the Socompa DAD was deposited, west of the foot of the volcano, and pumps it over 100km to the mine. The company provided us with an escort to Socompa and back (some of the new roads are limited access), lunch at the mine HQ, support for obtaining

gasoline, a site to set up our tents by their remote Monturaqui camp and pumping station, and ready-cooked meals. All these are essential when taking a party into an isolated area with no surface water, little infrastructure, and few roads. The generous collaboration of Minera Escondida made our trip possible.

Socompa is a dacitic composite cone (6020m high) located in the high, hyperarid Atacama desert on the border with Argentina. It would be one of a large number of similar, virtually unexplored cones in the region were it not famous in the volcanological world for its spectacular DAD. This deposit was discovered by Peter Francis (now deceased) and colleagues from The Open University (OU) and SERNAGEOMIN (the Chilean geological survey) in the early 1980's from Landsat images of the Andean high altiplano-puna region. Its origin and emplacement has been studied by Peter and others in a series of papers since 1985.

The group spent 4 full days covering most parts of the deposit (which is the size of a major city, about 550km²), up to 50m thick around the edges, over 35km long from the foot of the volcano to the distal edge, and a whopping 26km³ in volume. If these statistics don't impress you, remember that Mount St. Helens erupted only about 1km³ in 1980 (and all events afterwards) and that Pinatubo produced 5km³ in 1991. The largest eruption of the 20th century produced 11km³ of magma. No pictures can do the deposit justice; for one reason there's nothing out there to act as a familiar scale, but a couple of photographs of the group are attached at the end.

The DAD is not the product of an eruption per se, although it is thought that eruptive activity did accompany the event, but the result of collapse due to failure of almost half the total volume of the Socompa volcanic edifice. How and why it failed, how a mass of solidified lava-flows, soft sediment and pyroclastic rocks flowed as a dry, granular avalanche for over 30km, and how it climbed 300m up a small mountain range over 20km

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View from western edge of Socompa debris avalanche deposit across to the volcano (the top is over 20km away in background), with the group standing by the track of the Antofagasta - Salta railway which edges around the margin of the deposit.

Antofagasta, northern Chile

Field Excursion to Socompa Volcano, Chile

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from source, were the topic of much excited and heated discussion in the field. This was a chance for students and post-doctoral researchers to mix with international experts and hear opinions from volcanologists with varied experiences of DADs elsewhere around the world.

The group consisted of Open University undergraduate and postgraduate students (Anthony Lidster (u/g), Marie-Noëlle Guilbaud, Anne Jay, Kirti Sharma), post-docs Tiffany Barry, Ralf Gertisser, Luke Wooller (all OU) and Scott Bryan (Yale University), and Alexander Belousov and Marina Belousova (Kamchatka Volcano Observatory), Mike Branney (Leicester University), Claus Siebe (UNAM, Mexico), and Shinji Takarada (Hokkaido Geological Survey). The trip was led by Stephen Self (OU).

Stephen Self
Open University



Lunch at the PJBs! The avalanche deposit contains spectacular prismatic jointed blocks of dacite lava, which show evidence of being emplaced in the avalanche in a hot state, although not all the people in our group agreed with this interpretation!

SUPER-ERUPTIONS WEBSITE

I am alerting IAVCEI to the new web site on the Report that the Geological Society of London has produced entitled "Super-eruptions: global effects and future threats."

<http://www.geolsoc.org.uk/template.cfm?name=Super1>

Steve Sparks
Chair of the Geol Soc working group

VALE GEORGE WALKER

George Patrick Leonard Walker FRS, eminent volcanologist and university educator, admired friend of many in IAVCEI, died on 17 January 2005 at the age of 78.

An obituary for George Walker will feature in the next issue of IAVCEI News.

FUTURE MEETINGS

April 1-9, 2005

International Workshop on Ocean Island Volcanism
Cape Verde Islands
contact CV2005@ist.utl.pt

January 23-27, 2006

Cities on Volcanoes 4, Quito, Ecuador
contact: mhall@igepon.edu.ec

May 14-18, 2006

IAVCEI 2006 China, Continental Basalt Volcanism
contact: xlhuang@gig.ac.cn

July 2007

IUGG General Assembly, Perugia, Italy
contact: www.iugg.org

June 2012

IAVCEI 2012 Alaska, Centennial of 1912 Katmai Eruption, Fairbanks, Alaska, USA

Further information may be found on the IAVCEI website at www.iavcei.org

CONGRATULATIONS IAVCEI AWARD WINNERS

IAVCEI presented a full slate of awards at the Pucon General Assembly in November 2004:

Thorarinsson Medal

Wes Hildreth

Wager Medal

Andy Harris and Oleg Melnik

Krafft Medal

Tom Simkin

Outstanding Recent Graduate Award

Costanza Bonadonna

Citations, responses, and photos will appear in future issues of IAVCEI News.

Special thanks to the IAVCEI award committee:
Oded Navon – Chair, Bernard Chouet, Jon Davidson,
Tim Druitt, Setsuya Nakada.

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

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IAVCEI is pleased to announce new life members

Prof Masato Koyama
Dr Peter W Lipman
Prof Alan Robock
Prof Claus Siebe

Please consider becoming a life member — it is good for you and for IAVCEI.

This issue was edited by Steve McNutt, Secretary-General, and Jon Dehn, Deputy Secretary-General, IAVCEI Layout and Design by Caroline Giddings