Senior Travel Bursary Report
on attendance at a workshop in Arizona 31 March to 3 April 2007
on Explosive Volcanism

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I am very grateful for being awarded a Senior Travel Bursary. These funds helped me to accept an invitation to participate in an international workshop on Explosive Volcanism (*Integrating Numerical and Laboratory Models of Explosive Eruptions with Field Observations: Understanding Pyroclastic Transport*) held in Prescott, Arizona, USA, from 31 March to 3 April, 2007. The purpose of the workshop was to promote interaction and understanding between volcanologists such as myself, a mainly fieldwork-based researcher, and fluid dynamicists who undertake analogue experiments of volcanic phenomena, and mathematical modellers (some of whom were from fields outside of volcanology). A major aim was to discuss how to improve our physical understanding and modelling capabilities of explosive volcanic processes for better predictive purposes. The workshop involved US, Canadian, Russian, Japanese, and European-based participants.

The workshop dealt with three main themes, plume dynamics (the vertical and lateral transport of pyroclastic material through the atmosphere and its wind fields), pyroclastic flow dynamics (the transport and deposition by ground hugging pyroclastic flows), and integrating field campaigns, laboratory experiments, and modelling. Each theme lasted a day and included extensive discussions and break-out sessions as well as posters and presentations. It was generally agreed that while present models capture the general behaviour of explosive eruption processes, the next steps will be very testing as there is a dire need for measurements of parameters from actual actively erupting volcanoes, which are, of course, inherently difficult to obtain. New 3-D and 4-D modelling capabilities will be able to capture details of multi-phase explosive volcanic processes, but simpler models may be more useful for general predictive purposes.

During this trip to the US, I also worked with Prof. Michael Ort at Northern Arizona University, Flagstaff, to complete work on the AD 1080s Sunset Crater basaltic

eruption. The volcano is located just outside Flagstaff. This is an important and complex violent strombolian eruption, which has both volcanological and archaeological significance. Another activity was to collaborate with Drs. Greg Valentine and Ken Wohletz at Los Alamos National Laboratory, New Mexico, on aspects of the Bandelier Tuff caldera-forming, rhyolitic super-eruptions (1.6 and 1.1 Ma old). The Valles Caldera, which formed during these eruptions, is located adjacent to Los Alamos, so I was able to make some new field observations on the eruption products. I am currently writing a paper on super-eruptions for a forthcoming issue of the Joint North American-European Mineralogical Societies publication *Elements*, and attendance at the workshop and this visit to Los Alamos was very useful for that purpose.

Picture shows Stephen Self sampling what is suspected to be ash deposits from the 1.6 Ma Otowi eruption of the Valles Caldera at a site in the Sangre de Cristo Mountains, New Mexico, approximately 60 km from the centre of the caldera. [Photo by Ken Wohletz, 29/4/2007].

Stephen Self, Milton Keynes, 8 May 2007