

On Hades, and the inner workings of volcanoes

David Pyle

University of Oxford, Earth Sciences, Oxford, United Kingdom (david.pyle@earth.ox.ac.uk)

Where did the idea of the ‘descent to Hades’ come from? Most volcanoes whose craters I have peered into have required hours of limb-sapping toil to ascend. Scrambling through scree, scoria and snow to peer over the punctured summit, into the fuming crater below; followed moments later by grasping for the gas mask, before the fume triggers an asthmatic response.

Of course, Hades never was modelled on a volcanic mountain. With Vulcano, Vesuvius, Etna and Stromboli nearby, these live volcanoes and their pyrotechnic feats gave plenty of material to residents and passers-by, whom dreamt up stories of angry gods, deep hearths, thunderclaps and lightning. No, Hades was instead modelled on the slumbering, restless caldera of Campi Flegrei; the Phlegrean fields. Today, this is a vast steaming volcanic playground. Fuming mudpots, and steaming sulphur pits. A landscape that is alien, from wherever on Earth you may have arrived. Here, the clues to the mysterious, restless depths of the planet are tantalising. Elegant columns, fragments of a great Roman market place, contain the unmistakeable tidemarks of marine borings, two or three metres above the present-day shoreline. Sure signs of the rhythmic ups-and-downs experienced by this great volcanic system over past millennia. ‘Bradyseisms’, as the scientists might call it. Here, you may find the Elysian fields; the rivers Phlegethon and Styx and lake Avernus; the entrance to Hades.

Campi Flegrei remains an active volcanic system. In 1538, Monte Nuovo, the new mountain appeared in short order; followed, nearly a century later by the brisk re-awakening of Vesuvius in December 1631. But how, without following Aeneas, can we understand the deeper workings of the inferno? And why are these hot mountains so often associated with water? Volcanologists are historians of the magmatic world; we can never know what is about to happen, but instead build our understanding of what may happen from careful retrospective analysis of the archives of the material world. From these dusty fragments of past eruptions, and from the delicate marginalia preserved in mineral form, we learn to read the stories of past eruptions, and of what went before.

Further reading: Stock, MJ et al., Late-stage volatile saturation as a potential trigger for explosive volcanic eruptions. *Nature Geoscience*, doi:10.1038/NGEO2639, 2015.