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Special issue

When volcanologists meet archaeologists and other disciplines

Foreword

This special issue of Annals of Geophysics entitled: "When Volcanologists Meet Archaeologists and Other Disciplines: Relationships Between Eruptions and Human Communities" originates from a session (S13) of the Rittmann International Conference which took place in Catania on February 13th 2020, having as its main theme the history of volcanology and the impact of volcanic activity on humans.

The twelve articles collected in this special issue reflect the aims and contents of the reports presented by some participants at this session of the Rittmann conference.

Volcanological science already had the characteristic of a strongly interdisciplinary field in the vision that Alfred Rittmann developed during the course of the twentieth century. Current technology allows us to investigate volcanic phenomena by acquiring more and more data from different archives that make their processing and integration increasingly complex.

The study of the relationships between eruptions and human communities, together with the social, economic and urban consequences, embraces numerous disciplines ranging from volcanology, geology, geomorphology and geophysics, to archaeology, anthropology, sociology and history. Nevertheless, interdisciplinary studies between these various field of study are limited, both for the lack of a common language and for purely cultural reasons. Among the other interdisciplinary studies, a fruitful exchange of information between volcanologists and archaeologists and optimal integration of data from these two disciplines is necessary.

The main purpose of the papers collected in this special issue is to stimulate innovative and interdisciplinary approaches aimed at studying the history of volcanology and the relationships between eruptive phenomena and the communities that have interacted through time with volcanic phenomena, and also to improve the assessment of volcanic hazard and risks.

The twelve articles included in this special issue can be divided into two main groups. The largest group (eight contributions) deal with the eruptive history of some famous Italian volcanoes, and the impact that their activity had on the destiny of local communities, since prehistoric times. The other group (four contributions) deals with the volcanic context and its materials both as a resource for human communities and as a means of archaeological, historical and anthropological investigation. Below there is a brief review of the contents and authors of each work.

Eruptive history and human communities

The human presence on the slopes of Mt Etna volcano is reconstructed by Branca et al. starting from the first Neolithic settlements, together with the impact of the different eruptive manifestations and the volcano's geological changes on the prehistoric and proto-historic communities.

Volcanological and historical investigations on the 1971 major flank eruption of Etna and the formation of a new summit crater, the Southeast Crater, are presented by Branca et al.

A multimedia exhibition, created to illustrate the complex interactions between human settlements and the geological dynamics of the island of Ischia is presented by de Vita et al. The exhibition is hosted in the geological

section of the Archaeological Museum of Villa Arbusto, at Ischia, dedicated to the archaeologist Giorgio Buchner.

6000 years of human presence and abandonments at Stromboli Volcano and an overview on the whole Aeolian Archipelago are described by Di Renzoni et al. The authors conclude that the human presence is related more to the volcanic and island environment than to the volcanic activity.

Di Vito et al. present recent geo-archaeological discoveries which allow a detailed picture of prehistoric human settlements during the succession of intense activity and quiescence of the Campi Flegrei and Vesuvius volcanoes.

Giacomelli et al. reconstruct the effects on buildings, vegetation, animals and human of various phenomena occurred during the 79 A.D. Plinian eruption of Vesuvius. The authors focus the study on the site of Pompei.

Historical and cartographic documents are re-examined by Manni and Rosi. They confirm the emergence of a new island north of Vulcano, at the turn of the year 1000 AD, which played a prominent role in favoring the creation of the flat area of Vulcano Porto and a sandy isthmus that definitively connected Vulcanello to the main Vulcano island.

Volcanological, archaeological and historical data on one of the lesser known phases of the Eolian archipelago's history are presented by Martinelli et al. This volcanism occurred after at least 6000 years of quiescence and was followed by a demographic crisis between the 6th and 11th century AD. The authors pay particular attention to the last eruption in the 13th century during the Early Middle Age.

Volcanic landscape and materials as resources

Foresta Martin and Furlani investigate how geomorphology, volcanic materials and other local resources influenced the choice of early human settlements sites, their development and their end in the small volcanic island of Ustica (Palermo, Sicily).

Lava millstone covering a period from the Phoenicians to the Romans are investigated by Santi et al. The authors propose a set of discriminating geochemical parameters to identify the four main volcanic areas of Italy used in the antiquity to produce millstones: in the surrondings of Orvieto, Etna, Hyblaean mountains and Pantelleria.

The discovery of a new Neolithic settlement in the island of Ustica (Palermo, Sicily) is described by Speciale et al. The authors characterized materials and tools found during excavation and established their possible provenance.

Environmental and climatic changes during the late Pleistocene at the Monte Amiata volcano (southern Tuscany, Italy) are reconstructed by Vezzoli et al. using paleontological samples quarried since 16th century from small extinct lake basins of late Pleistocene in the foothills of Monte Amiata. They are part of *the Ezio Tongiorgi paleontological collection* consisting of fossil diatoms exposed in *the Museum of Natural History of the University of Pisa.*

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