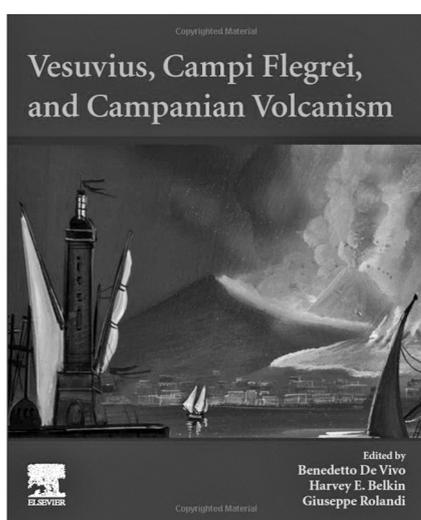


Vesuvius, Campi Flegrei and Campanian volcanism, by Benedetto De Vivo, Harvey E. Belkin and Giuseppe Rolandi (Eds.), 2019. Elsevier Inc., Amsterdam. 520 pages. Paperback: price \$175.00, ISBN 9780128164549.



This large-format Elsevier volume is made up of 17 separate, stand-alone papers in which the main active volcanoes of the Campanian region are presented. Given the wealth of volcanological research emanating from the Neapolitan area, it is not surprising that the editors have decided to publish a new text on this famous volcanic region. How not to agree with the observation that, ‘... all the answers have *not* been given regarding the science of the Neapolitan volcanic region’. The editors, all experienced geologists (now retired), have assembled papers that cover a diversity of topics, including geodynamic evolution (Pierantoni *et al.*, Nunziata *et al.*, Milia and Torrente), petrology and geochemistry (Peccerillo, Cannatelli, Esposito, Fowler, Stabile and Carroll), volcanology of the largest events vented in this region (Rolandi *et al.*, chapters 8 and 11, Ruberti *et al.*), bradyseism (Moretti *et al.*, Cannatelli *et al.*), the Holocene marine record (Sacchi *et al.*) and hazard assessment (De Vivo and Rolandi). Most of the papers have adopted a declared review-style that summarises previous studies.

The introductory chapter presents a brief summary of each section. One of the most intriguing chapters (Chapter 2) is devoted to two American

volcanologists, Henry Washington and Frank Perret, who, at the beginning of the twentieth century, dedicated most of their lives to Italian volcanoes with particular emphasis on the volcanological region around Naples. They published two classic papers, entitled the ‘Roman comagmatic region’ and the ‘Vesuvius eruption of 1906’. They spent part of their lives in Italy where, for their outstanding scientific contributions, they were appointed Cavalier of the Order of the Crown. The authors inform us that Washington was so close knit to Italy that in America he lived in some rooms above an Italian restaurant. Neapolitan volcanoes transform ordinary people into volcanologists! This happened to the engineer Perret, assistant to Edison, as well as to the English doctor Johnston-Lavis, author of the first geological map of Vesuvius, who was fascinated by the activity of the Vesuvius. Although Lavis was English, a comparison with the two American researchers would have been interesting.

An interpretation of the plate-tectonic evolution of the Tyrrhenian-Apennine system is outlined in the third chapter and explored in greater detail in subsequent chapters where the lithospheric structure of the Campania Plain is defined on the basis of tomographic studies (Chapter 4), while a link between extensional faulting and volcanism is developed to investigate offshore and onshore areas (Chapter 12). The bulk of the book is devoted to geochemical aspects. A wide range of geochemical information is synthesised and illustrated in five chapters. The geochemical section is arranged to cover the different volcanic areas, from an overview of the province of Campania to single volcanoes. The key details and arguments associated with the petrology of Campanian volcanoes are presented within the context of their tectonic framework, geological setting and plate tectonics (Chapter 5) and deepened with the use of petrologic experimental data (Chapter 13). Melt inclusions are the tool used to, ‘... trace the evolution of magma from its formation at mantle depth to its release to the sur-

face' for Vesuvius (Chapter 6) and Campi Flegrei (Chapter 7). Chapter 10 illustrates the petrogenesis of Campanian ignimbrites. Actually, this chapter is partially dedicated to small Phlegraean pyroclastic deposits and emphasises the importance of fractional crystallisation and open-system mechanisms during magma evolution.

The subsequent volcanological chapters (8, 9 and 11) focus on the two largest eruptions of the Neapolitan area, the Campanian Ignimbrite (date 39 ka) and the Neapolitan Yellow Tuff (15 ka). Contrary to what the title of the volume suggests, there is no description of Vesuvian deposits. The main aim of the authors is to propose, yet again, their model that the Campanian Ignimbrite was not vented from Campi Flegrei and consequently only the Neapolitan Yellow Tuff eruption produced the Campi Flegrei caldera. Most of the results are based on integration of new and previous borehole logs. Beyond the clues about the origin of the Campanian Ignimbrite, the volcanological reference models appear confused as well as the acronyms used DPC (Dense Pyroclastic Current) or PDC. A turbulent parental flow with, '... an estimate current thickness of 2000–3000 m' is incompatible with a diffuse welding '... related to the load-welding model ... because of high pressures from compaction...'. Referring to basal levels as ground surge layers and to the main ignimbrite as emplaced by a pyroclastic current means to use indiscriminately irreconcilable interpretative models. Finally, the authors should consider that the northerly extension of their CampiFlegrei caldera rim (Fig. 11.7) is simply a topographic structure mantled by tuffs that underlie the Neapolitan Yellow Tuff.

Active ground movement and seismic activity are usual phenomena in the Campi Flegrei area. The upsurge of these events in recent years has led the authorities to place the zone at a higher level of alert. Two chapters (14 and 15) are devoted to bradyseism and its endogenous causes. Both agree that bradyseismic events are not related to the emplacement of magma at shallow depth but are promoted by overpressured fluids. In these views, the probability that an eruption will occur at Campi Flegrei is decreasing. Volcanic structures and deposits submerged in the Bay of Naples are outlined in Chapter 16.

The final chapter describes, in a critical way, the upgrade of emergency plans of the Italian Department of Civil Protection for Vesuvius and Campi Flegrei. It offers a poignant reminder that, during the last decades, two teams have produced different models and rather than confronting each other, even in a heads-on manner, they have generated an incurable conflict that prevents a shared synthesis and falls on a dazed public opinion.

Each chapter has its own bibliography. The volume concludes with an index in which contents, selected figures and tables are arranged. Full-colour illustrations in the various chapters of this time appear randomly distributed; some chapters contain only b/w figures (e.g., Chapter 10), while others have both full-colour and b/w figures (e.g., Chapter 13) and most sport full-colour images. There are instances of the same illustration in colour (Chapter 5, fig. 5.1) and b/w (Chapter 10, fig. 10.1).

An editorial curiosity: on the official Elsevier website, many chapters have different titles and authors. For example, the first chapter listed in the table of contents is entitled 'The volcanological history of Campania volcanism', while the actual printed chapter is *simply* an 'Introduction to Vesuvius, CampiFlegrei, and Campanian Volcanism'. Authors and readers have probably missed the opportunity to argue about the volcanological history of this region. I do hope that these discrepancies between the online and printed versions will be resolved as soon as possible to allow readers (who consult the online version) to know the real contents of this book.

This volume is a very readable account of an area that has been the focus of a huge amount of geological research in recent decades. In conclusion, after having started to read, with high expectations, the fully updated contents, it seems that the book, which deals with an archetypical volcanological area, has only scratched the surface of a shared synthesis. A wide-ranging and engaging discussion on the different models developed to interpret the volcanic evolution of the Neapolitan area would have done us all a great service.

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