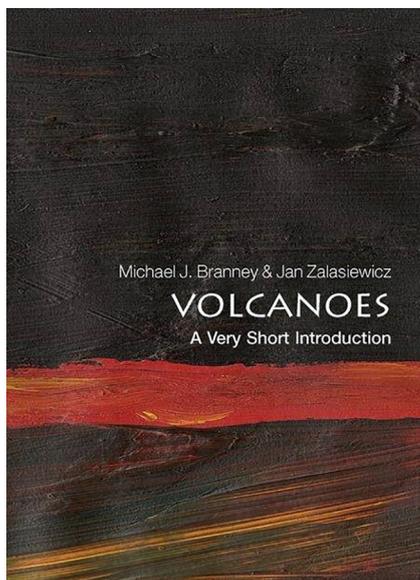


**Volcanoes: a very short introduction**, by Michael J. Branney and Jan Zalasiewicz, 2022. Oxford University Press, Oxford, UK, 184 pages. Paperback: price €11.06, Kindle: price €5.44, ISBN 978-0199582204.



This book is part of a peculiar series, entitled ‘Very Short Introductions’, which currently comprises over 650 volumes that cover a wide array of topics in every discipline from the philosophy of science to the theory of relativity. Now, volcanology has been added. Of the authors, Mike Branney is a renowned volcanologist, who has dealt mainly with large explosive eruptions; Jan Zalasiewicz is a famous palaeontologist, who has written and edited several books, including two tomes in the present series.

Let us start by providing some numbers: 184, 144 and 17, or, in words, the number of pages, the weight (in grammes and the height in centimetres, respectively, of this small book with great content that can be carried around and consulted anywhere. Even on your next trip to Hawaii, Iceland or Italy. Before turning to the contents, let us dwell a bit on the book’s physical features. Why is it necessary to consider the pages and weight of a book if a cheaper electronic version is available? I suppose this is because these booklets should not only be pocket

sized in form but also in content. So whichever version you choose, paper or electronic, you will find a nimble volume to guide you through fumaroles, craters, obsidians and vineyards (what connects vineyards and volcanoes will be explained below).

Nine brief chapters, each of between 15 and 20 pages, describe the essence of volcanology: from the making of magma (chapter 1) to volcanoes beyond Earth (chapter 9). Descriptions are often followed by lighter comments that make the reading less technical and more fluent. For example, in explaining the wide distribution of basaltic magmas, the authors write, “Consequently almost all of the ocean crust is made of basalt. The Earth machine, in some respects, is very well regulated”. The language used is deliberately simple and at the same time emphatic so as to ensure that the reader grasps all scientific aspects and is intrigued to continue reading. Note how the term tuff is introduced and how the large volume emitted during the eruption of the Bishop tuff is emphasised. “‘BishopTuff’, an outpouring of ash (‘tuff’ is its hardened version) that reached the prodigious volume of 500 cubic kilometres and affected much of North America”. Sometimes the authors exaggerate in making the proposed experiences accessible. For instance, instead of inviting readers to take a walk to some volcano to see pumices (light volcanic clasts), they advise them to buy pumice at ‘your local pharmacy’.

A full chapter indeed does justice to the methods adopted by volcanologists in order to reconstruct the eruptive history of a volcano. The limitation in this kind of simplified descriptions is that they fail to explain how to calculate some physical parameters. Statements such as “the volume of each eruption can be calculated, using the layer thickness contours (isopachs) to estimate the total volume of the pumice in the layer” are assertions rather than explanations.

The complex interaction of magma and water is described in chapter 3. Phreatic, phreatomagmatic,

Surtseyan, phreato-Plinian and pillow lava eruptions illustrate the vast and varied ways in which magma or an eruptive column interacts with the abundant water on our planet. Effusive eruptions, which usually open volcanology texts, are presented here after explosive eruptions. The classical order probably stems from a greater emphasis on these phenomena in the past and simpler physical models than those of explosive eruptions. The authors, who are devoted primarily to research into explosive volcanism, perhaps find explosive events more appealing and therefore offer them first to their readers. The authors' personal scientific background becomes clearly evident from examples given: the welded ignimbrites of the plane of the River Snake or Pantelleria, the enormous Whorneyside phreato-Plinian eruption at Scafell volcano or even recalled in the vivid memories of the church on wheels moved during effusive eruptions in Hawaii. The importance of obsidian lavas in Neolithic culture is rightly emphasised as is the ability to trace the source through geochemical surveys that allow reconstructions of ancient trade routes. One chapter is devoted to the great variability in shape, scale and longevity of volcanoes.

In describing calderas and their characteristics, the authors mention the tourism generated by fumarolic activity in the Campi Flegrei (near Naples, Italy), describing this caldera as Italy's most dangerous active volcano (a statement with which I agree) and leaving out the cliché that sees Vesuvius as Italy's most dangerous volcano. This chapter not only describes the formation processes of the various types of volcanoes, but also how they "will ultimately be stripped almost completely away by nature's relentless action".

"Tales from the past" is a lovely chapter. After elucidating the importance and uniqueness of studying extinct volcanoes, even those that are millions of years old, through erosion that brings their deepest parts to light, a series of cases in Wales, England and Scotland are presented.

"Diamond volcano" is the title of a paragraph that will certainly provoke a certain effect upon the readers. The ability of volcanoes to drag these valuable minerals to the surface during ancient explosive eruptions is brilliantly summarised in the sentence "diamonds would have rained down out of the sky with kimberlite ash around the erupting volcano". The other side of volcanism, the one that does not deal with destruction and death but rather with the deep reasons for the appearance of life on our planet is introduced in Chapter 7, where it is made clear that atmospheric gases and water in the oceans were released by volcanic eruptions. In the

following paragraphs, inevitably, we again begin to catalogue the negative effects of volcanism, from the floods caused by the remobilisation of volcanic ash to the mass extinction of most terrestrial species probably caused by the great lava expansion in the latest Ordovician, in the late Devonian and at the end of the Permian, Triassic and Cretaceous periods.

What have volcanoes done for us? This is a question that the authors answer with great diligence by providing a long list of natural and man-made events that, in their opinion, are more dangerous than volcanism. The list includes, in order of hazard (?): bad weather, cars, cigarettes, floods, earthquakes, crime, disease, pollution, genocide, obesity, alcohol, drugs and drought. The true answer to the previous question recalls the abundance of crops in volcanic areas, the varied use of volcanic materials and the presence of aquifers in volcanic rocks. Certainly, volcanoes erupt and must be monitored so as to avoid us being taken by surprise. Even with modern technology we still have to record hundreds of deaths caused by volcanic eruptions, especially in regions where there is little or no monitoring. Yet, volcanism is not restricted to our planet; observations and space probes are increasingly revealing the presence of volcanoes on other planets and satellites. From the lava domes of Venus to the shield volcanoes of Mars, where Mount Olympus reaches 22 km in height (being the tallest volcano in the solar system), to the eruptions of Io that rise hundreds of kilometres above the surface: volcanism is widespread throughout the universe.

Black and white figures counterpoint the descriptions in this small volume. By now we are accustomed to garish pages and dynamic URLs. These illustrations are reminiscent of my college student textbooks, a beautiful memory to me, but this may look old fashioned to the younger generation. Here, I would like to make a very pedantic remark. In Figure 10, a cartoon describing how pyroclastic currents propagate, indecipherable oblique features appear at the top. This is a part of the original figure taken from an earlier book by one of the authors which has not been removed.

The present publication is not a textbook for university students; however, this is a virtue, rather than a flaw. The authors have made an enormous effort to simplify the language, translate volcanic processes into examples of everyday life, recall historical events that may have been affected by volcanic activity – in other words, put in place all available means to make the reading scientifically sound but enjoyable. I hope that this series and in

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particular 'Volcanoes: a very short introduction' can be translated into other languages so that a wider audience may enjoy it.

*Claudio Scarpati*  
*University of Naples Federico II, Naples, Italy*  
*e-mail: claudio.scarpati@unina.it*