

BOOK REVIEW

Adam Bobbette, *The Pulse of the Earth: Political Geology in Java*

Durham, NC: Duke University Press, 2023. Pp. 428. ISBN 978-1-4780-2505-4. \$26.95 (paperback).

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Adam Bobbette's study of volcanology and its intercalated histories in Indonesia makes a compelling case for the volcanos of Java being sites where modern understandings of humanity's role within the creation of the Earth have been forged. The book frames the attempts of Dutch scientists, Javanese mystics, Theosophists, precolonial sultans and postcolonial politicians to commune with volcanos as a longer history of grappling with, in today's parlance, the Anthropocene – the current geological era in which humans have become a significant factor in the climate and ecosystems on a planetary scale – albeit not in those terms. This is a timely reminder that the contemporary scientific imperative behind the popularization of 'the Anthropocene' belies older modes of working through the place of human societies in relation to geological forces.

Javanese volcanos have long been recognized as an important node in the development of new scientific understandings of the Earth's geological forces. Bobbette successfully reconnects these theories to the animate role of volcanos themselves as well as to the thought and practices of Javanese peoples who lived beside them. *The Pulse of the Earth* teases out Javanese mysticism's role in shaping volcanology, even while these beliefs were transformed by modern scientific understandings and technologies. Bobbette's study is also attuned to the economic and political aspects of volcanology. Remaining alert to these wider and deeper histories of the earth sciences entails 'political geology as method' (p. 1), an approach elaborated in the first chapter and then consistently practised throughout the remaining five.

The first substantive chapter of the book is organized around four maps that sought, for different reasons and using different techniques, to capture Java's volcanic topography. The maps captured key moments in scientific understandings of the Earth, while being partially motivated by extractivist capitalist ambitions. The first map, from 1896, was drawn on the premise that the continents were permanently fixed in their places on the globe. It evidenced a catastrophic narrative of the lands arising and descending into the sea through volcanic activity, a narrative that was imbued with the colonial trope of envisioning Javanese society as the ruined remains of Hindu and Buddhist cultures overlaid with a thin veneer of Islam – a theme identified throughout the book. The second map, from 1931, saw Java not as a ruinous, imperilled land mass, but as a fold in the ocean floor produced by gravitational forces. The third map Bobbette considers was, in fact, a multivolume compendium of accumulated geological data about Indonesia published at the end of the Second World War. In this text, Java was forged not by gravity but by subterranean undulations caused by the cooling of the Earth. The final map was

that made by the American geologist Warren Hamilton at the behest of the celebrated Indonesian earth scientist and close associate of Suharto, John Katili, in 1979. Hamilton built on these earlier maps to introduce the ascendent understanding of plate tectonics to account for Java's geological past, something the astute Katili turned into an optimistic narrative of the nation's postcolonial development potential. This chapter is the closest that *The Pulse of the Earth* gets to a straight history of science, and it helpfully provides the reader with an overarching intellectual context that the following chapters make considerably messier and more complex.

Chapter 3 picks up on the term *intercalated*, Hamilton's word to describe the hybrid geological conditions of littoral spaces, to capture how Javanese spiritual geography 'shadowed, mirrored and ... transformed' the theory of plate tectonics (p. 56). The goddess of the Indian Ocean, Nyai Ratu Kidul, was recognized as the forger of the Earth and her sanction was sought for the establishment of states, both precolonial and postcolonial. This has been, and continues to be, marked through the annual ritual procession, called the *labuhan*, where offerings were made from the opposing pole of the spiritual geography, the volcano, home of deities and ghosts. Bobbette argues that in this spiritual geography, the kernel of plate tectonics can be found. However, he notes that in contrast to contemporary earth sciences, Javanese spiritual geographies insisted on the co-production of the geological and the political. These insights are built on in the following chapter, which examines the role of Theosophists in acting as something of an unreliable bridge between Javanese spiritualism and Dutch geological scientific thought, focusing on their understanding that pre-Islamic Javanese empires were destroyed by a devastating volcanic eruption in 1006 AD. These Theosophists' ruminations on Javanese cultural decline were not only a product of late colonial anxieties; they also left an imprint on Javanese mysticism into the late twentieth century, providing a space in which geology and theology were combined. These are themes furthered in the fifth chapter through a close study of the work of Johannes Umbgrove, whose self-proclaimed early twentieth-century geopoetic methods were the product of Javanese spiritual traditions. Umbgrove's geopoetics were not merely a literary aesthetic brought to bear on geological understandings, but a commitment to exploring speculative, even unprovable, theorizations that connected geological and astrological forces. Akin to the Theosophists whose circles he was connected to, he also acknowledged the Hindu cosmological antecedents to modern geological understandings.

Bobbette's book ends with a chapter that in many ways takes inspiration from Umbgrove's 'dandy scientist' approach to nebulous connections by examining the ways in which various human actors have sought to communicate with volcanos – from observatories to practitioners of the Javanese belief system, Kejawen. The chapter shows the transit in ideas, languages and practices between scientific equipment (such as seismographs), infrastructural technologies (like telephones) and folk beliefs, accounting for geopolitical shifts and influences in the process. Perhaps a looser chapter than the others in the book, it is nevertheless a fitting end to a monograph that successfully explodes the history of the geological sciences to excavate the ways in which Javanese volcanos and the peoples who populated them forged expansive understandings of the Earth.