

claims to gold deposits by emphasising their adherence to Senegalese law' (p. 164), which often receives state validation. *Orpailleurs*, d'Avignon further indicates, propose a moral and inclusive claim to mineral ownership and exploitation by seeing *orpaillage* as their 'granary' and 'livelihood', benefiting 'men, women, citizens, and migrants' (p. 164). This calls for a wider conversation about the competing 'language of subterranean rights'. This is because some postcolonial states' mining regimes are criticized for failing to transform the lives of citizens living on lands with rich natural endowments. If possible, could the author situate different conceptions of morality in extractive industries face to face with corporate social responsibility? Would there be synergies? This is against the backdrop of *orpaillers*, in this book, and small-scale miners elsewhere showing levels of cooperation with corporations.² If the author were to expand the current framework or choose another, where could human rights fit into this long historical puzzle about contested entitlement or legitimacy over 'subterranean rights'?

Also, *orpaillers* are shown to negotiate the gold-mining space by harnessing several ideas in a complex web of issues. Two are the positioning of 'racism' and 'ethnicity' (p. 180). Could a deeper engagement with 'ethnicity' help address the issue in context better than the use of 'race' (Lynch 2018)?³

To conclude, *A Ritual Geology* is an intellectually stimulating masterpiece for historians, anthropologists, policymakers and scholars interested in interdisciplinary research into the global and environmental history of resource extraction.

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We tend to associate mining with big technology, big capital and planetary globalization: a hydraulic shovel produced in the USA might be operated by a French engineer in a Malian mine listed on the London Stock Exchange. Robyn d'Avignon's *A Ritual Geology* masterfully shifts the scale, zooming in on the women panning for gold with sieves in Kédougou and the men working the placer deposits with handpicks in Sabodala. Yet the book's most powerful intervention is to show that these two scales – of transnational mining capital and of artisanal mining in savanna West Africa – are intricately connected and interdependent: colonial French geologists targeted known outcrops identified by Senegalese *orpaillers*, while contemporary *orpaillers* benefit from technology transfer and Chinese mining equipment. D'Avignon underlines the role of West African mineworkers as a pivotal source of geological data, labour and techniques crucial to the success of the capitalist endeavour to profit from the subsoil. Through a convincing combination of ethnographic and historical

² N. Yakovleva and D. A. Vazquez-Brust (2018) 'Multinational mining enterprises and artisanal small-scale miners: from confrontation to cooperation', *Journal of World Business* 53 (1): 52–62.

³ G. Lynch (2018) 'Ethnicity in Africa' in *Oxford Research Encyclopedia of African History* [online], <<https://oxfordre.com/africanhistory/>>.

approaches, d'Avignon shows 'how corporate mining is shaped by histories of wealth and sacred engagements with the earth that predate and evolve alongside it' (p. 200).

The book explores the complex regional language of subterranean rights, through which capitalist gold mining is enlisted 'in webs of responsibility and exchange' (p. 164). This takes the shape of what d'Avignon terms a ritual geology, 'the set of material and ritual practices, prohibitions, and ideological engagements with the earth and its spirited inhabitants shared widely across a geological formation' (p. 61). By recounting the centuries-old stories of Bida and Nininkala, d'Avignon shows how spirit snakes promised wealth in gold in exchange for human sacrifices. Human-spirit pacts, in this sense, 'cemented the claims of people to natural resources' (p. 74), materializing the ongoing struggle over mineralized land. Such a focus shows that gold can simultaneously be a globally circulating commodity and 'a ritually fraught object attached to occult forces, territorial spirits, and mobile spirit snakes' (p. 62).

Path-breaking in its methodology, this detailed ethnography brings out local specificity – in terms of the cosmology and epistemology of eastern Senegal – but the book simultaneously situates this place-based and embodied knowledge in a broader regional context of connectivity. Regional parallels are created by shared patterns of French colonialism and postcolonial legacies of *Françafrique*, but they also have deeper roots in the trans-Sahara gold trade. A researcher without d'Avignon's decade-long intimate engagement with eastern Senegal would not have been able to uncover the nuances of the region's ritual geology. Yet the book goes beyond local specificity, to show how French colonialism generated a framework in which artisanal mining – *orpillage* – became legally separated from industrial mining. *A Ritual Geology* shows that this separation was motivated primarily by the wish of the colonial and postcolonial governments to profit from mining by minimizing the interference of skilful artisanal miners.

Towards the end of the book, d'Avignon invites other researchers to take geological structures as an entry point into African history. Scholars of resource extraction, such as Kathryn Yusoff, Timothy Mitchell and Timothy LeCain, have long advocated taking materiality seriously. Yet in an Africanist setting, d'Avignon urges us to specifically pay attention to how resources are inscribed into human and human-spirit relationships. The book 'invites us to consider how other African societies, in different time periods and regions, have constructed knowledge about the subsoil and defended claims to its resources' (p. 202). How can this be applied to localities with century-long histories of large-scale industrial mining, such as the *Zambian Copperbelt*, which are shaped heavily by migrant labour in a context where kilometres-deep mine shafts have obliterated environments? How much precolonial ritual knowledge remained in these localities? The *Copperbelt* has a long and rich history of copper-mining knowledge, dating back to the first millennium CE. Yet artisanal mining all but disappeared with the rise of the copper-mining industry in the twentieth century. Only recently have artisanal miners (*jerabos*) been regaining prominence by recovering copper traces from mine dumps. Yet these two histories are rarely connected. *Jerabo* claims to mineral wealth are very much framed in a post-industrial manner, without reference to precolonial legacies. Questioning to what extent ritual geology plays a role in contexts such as those on the *Zambian Copperbelt* seems very worthwhile.

A final issue to consider, particularly in our current time of the Anthropocene, which appears to be addicted to extraction, is what ‘our rightful share of the earth’s subterranean granaries’ ought to be (p. 206)? Would the answer to this question change if we seriously considered locally specific ritual geologies?

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Response by the author

I am honoured by Muriel Côte’s, David Damtar’s and Iva Peša’s thoughtful engagements with *A Ritual Geology*. With the limited space I have here, I will respond to the provocations of the reviewers about the limits and possibilities of a ‘ritual geology’ as a concept and the politics of producing knowledge about *orpaillage*.

Muriel Côte queries if West Africa’s ‘ritual geology’ is in fact gendered, given such practices as African men leading colonial and postcolonial geologists to ‘*anciennes mines de femmes*’ (p. 120). Women also cultivated distinct ritual engagements with the female-spirited snake of Nininkala, who haunts alluvial gold deposits along riverbanks. The dozens of oral histories I conducted with women *orpaillieuses* enabled me to document the shifting engagement of women with gold mining and processing over the course of the twentieth century in Senegal and, in more isolated cases, Guinea and Mali. But it was more difficult for me to discern how women had shaped West Africa’s ritual geology – ‘practices, prohibitions and cosmological engagements with the earth’ – in earlier time periods. In part, this was an issue of sources. Arabic manuscripts and oral traditions that reach back to the medieval period contain few references to women’s work in gold mining. Some oral traditions relay gendered concepts about the management of gold and water, but it is difficult to discern if women shared or authored the concepts relayed in oral texts. More work can and should be done to track the gendered evolution of the region’s ritual geology. One promising avenue would be to compare women’s songs with oral traditions about gold across a wide geography. I am also hopeful that ongoing ‘salvage’ archaeology – carried out before corporations dig new open-pit mines – will shed more light on the evolving nature of women’s gold prospecting and mining work over the *longue durée*.

Iva Peša takes up my provocation that a ‘ritual geology’ could have comparative value elsewhere in Africa and beyond. But, as Peša rightly points out, we are unlikely to find much continuity in terms of African mining and religious institutions in a place like the Zambian Copperbelt or on South Africa’s Witwatersrand, where a long history of industrial mining has largely obliterated precolonial mining economies.