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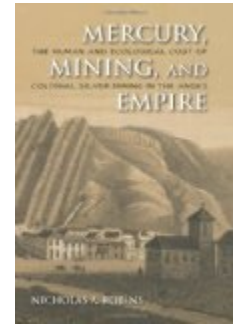


Nicholas A. Robins. *Mercury, Mining, and Empire: The Human and Ecological Cost of Colonial Silver Mining in the Andes*. Bloomington: Indiana University Press, 2011. xiv + 298 pp. \$45.00 (cloth), ISBN 978-0-253-35651-2.

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Of all the natural resources produced by human societies, silver was the first whose extraction, commodification, and consumption were driven by globally scaled processes. This began in the late sixteenth century when Spanish and Portuguese trade routes laced across the oceans and bound the continents together into a single worldwide trading system. Global consumption drove local production. The silver won from the mines of Mexico and Peru was, after numerous detours and ellipses, bought up by merchants in Macao, Goa, and Antwerp, and throughout the Mediterranean. This guaranteed an ever-increasing demand for the metal, stable or rising prices for producers, and thus constant efforts at extracting greater and greater amounts of the metal. The results were remarkable. Over close to three centuries of operation, silver from Spain's American dominions tallied some 84 million kilograms, about 85 percent of the early modern world's silver supply.

While the economic dimensions of silver were global in scope, its political ecology operated at much more circumscribed (intimate, even) scales. Mining has always incurred important social and environmental costs—drafts on human and natural capital that were (and still are) considerable but that have only recently been brought into account. In the early modern period, the costs of silver production were mainly borne by regional society; local watersheds and ecosystems; and the blood, lungs, and nervous systems of the tens of thousands of human bodies that labored in the mining complex or lived within its sphere of influence.

Nicholas A. Robins's *Mercury, Mining, and Empire* takes us into the heart of this “global economic vortex”:

the Andean mines of Potosí and Huancavelica (p. 39). It presents a comprehensive socio-ecological history of colonial silver mining in the Americas. The historiography on colonial mining is of course rich and deep, but it has hitherto concentrated on questions of labor, production, markets, or ethnic and social relations. Likewise, a number of shorter pieces on colonial mining's environmental dimensions have been produced over the last decade or so, but none of these has quite the integrative sweep of *Mercury, Mining, and Empire*. This is perhaps the book's foremost contribution: forwarding new research results on the environmental impact of mining and weaving it into a political economy and social history. This synthesis, delivered in clear and lively writing, makes for one of the fullest and powerful accounts of colonial mining available.

The book begins with a sharp and pithy account of early mining in the Andes. It lays out the different pieces of the extractive system developed by the Spanish Crown to resource the mines. This included the biopolitical work of reorganizing the surviving Andean population to meet the mines' ever-growing needs for labor; the mustering of thousands of Andean *mita'a* (corvée) workers to transform the regional hydrology of lakes and rivers into a hydraulic system capable of generating the greatest concentration of mechanical energy in the preindustrial Euro-Atlantic world; and the development of the mercury mines of Huancavelica, in the highlands some two hundred kilometers southeast of Lima, that produced the estimated sixty-eight thousand tonnes of mercury needed to win the silver from the ores of Cerro Rico. The remaining four chapters move between Potosí and Huancavelica, the silver mine and the mercury mine, at the

heart of the Andean silver industry. Robins moves the reader back and forth between them, providing a comparative view of the social and environmental costs of mining.

Regarding the social component, Robins argues that mining drew out the very life of indigenous societies; it incarnated “the blood and sweat of the Indians” and was ultimately a form of genocide (p. 69). In this he follows a venerable line of colonial polemics. Readers will be most familiar with Bartolomé de Las Casas who, in the first half of the sixteenth century, argued that mining caused the “killing and destroying of an infinite number of [Amerindian] souls.”^[1] This calling of account of colonial mining never really let up. One finds it in the reports and memorials filed by a line of colonial authorities and churchmen. Their writings provide some of the most immediate and terrible accounts of colonial silver and mercury mining. Robins makes excellent use of these documents to recreate a vivid portrait of mining hell.

The evidence that he presents is shockingly clear: an estimated 50 percent injury rate; tremendous physical labor in conditions of high temperatures, noxious gases, and silica dust laced with heavy metals (especially in the mines of Huancavelica); and mass cave-ins in any given decade. The workers who faced these conditions were Andean peasants—highland cultivators and pastors—conscripted by the *mita*’a into laboring the mines. The communities within the recruitment area of Huancavelica soon became aware of the human costs of mercury mining, as broken men—laced with mercury and stricken with the “*mal de Huancavelica*” (either tuberculosis or miners’ lung)—made their way back home, or when they realized that many would not return at all. The peasants of the region fled their communities and their lands rather than get caught in the mines of Huancavelica.

Potosí was different from Huancavelica in this respect, but the book’s structure elides this difference. Conditions of labor in Potosí were clearly dangerous and long-term effects most certainly contributed to the early deaths of miners. The annual death rate, however, was estimated at fifty men at a time when tens of thousands of miners worked the Cerro Rico—a significantly lower rate than what we might estimate for Huancavelica. The second key difference was that Potosí miners stood to make significant personal fortunes from mining. This was part of the moral economy of colonial mining, in which miners were allowed to keep ore extracted on Sundays for themselves (*kapcha* in the Andes, *partido* in New Spain).

The winnings were important and frequent enough to make Andean peasants take the devil’s gamble and seek their fortune in the mines. Within a generation or so, the number of these miners outnumbered the number of *mita*’a laborers. Indeed, with every passing *mita*’a a new group chose to stay on.

This choice was a form of social agency that sits awkwardly within a genocidal explanation. The miners of Potosí formed part of the first indigenous working class in the Americas. They founded in the sixteenth century a community that exists to this day. A strong line of historiography details the colonial phase of their trajectory—how Andeans created spaces in the workplace, how they formed their own circuits of production and circulation, and how they created and recreated ethnic and social identities. In the twentieth and now again in the twenty-first centuries, these miners have marked the national history of Bolivia. I agree with Robins that something like genocide was indeed organized around the mines of Huancavelica, but Potosí was a more complicated story.

Robins extends the comparison between the two mines to his discussion of the environmental impact of mining. As elsewhere in the book, the treatment is comprehensive. It shows how mining consumed entire landscapes of forests and ligneous plants for fuel, and how entire watersheds were reworked for mining. Robins’s main contribution, however, is in his reconstitution of mercury contamination and its consequences for environmental health. The principal problem was smelting—during the refinement of mercury at Huancavelica and of silver at Potosí. Furnace design and construction being what they were, the emission of mercury vapor was inevitable. In Huancavelica, smelter workers were regularly laid low by *endiabladas* (literally “devilries”): blasts of hot mercury-laden air escaping from the furnaces.

Reaching out to current science of emissions modelling, Robins develops a model to estimate the amount and diffusion patterns of mercury emissions in both mines. The results are chilling: 68 tons for Huancavelica and 154 tons for Potosí, on an *annual* basis (p. 130). These estimates were then fed into AERMOD, an emissions simulator developed by the American meteorological and environmental services, to generate a number of maps and values on the contaminant plumes produced by smelting. Robins then associates these findings with the historical evidence of the band of syndromes associated with mercury poisoning: severe neurological breakdown, reproductive damage, birth deformities, and psychological trauma. It makes for harrowing reading.

Here again Robins concludes that Huancavelica and Potosí were, all things being equal, basically similar. The environmental health costs of both were registered in the populations chronically afflicted by mercury poisoning: “toxicity was the norm,” he argues (p. 185). A close reading of the data provided by the book reveals much stronger evidence for Huancavelica. Detailed and disturbing descriptions of mercury poisoning (and other ailments, such as silicosis and tuberculosis) come out of the reports of priests and officials stationed there. As for Potosí, however, Robins himself is puzzled by the lack of direct evidence and has to resort to more indirect ways of proving causality. Some of these have trouble holding up to a skeptical reading. For example, Potosí’s ambient social climate of low-intensity violence and madness is tied to generalized mercury intoxication, but there were clearly other possible reasons for these.

Saul Guerrero’s current PhD research may eventually shed some light on the apparent discrepancy between Robins’s model and the on-ground descriptive evidence. Guerrero theorizes that a large majority (perhaps as much as 90 percent) of the mercury lost in silver refining in Potosí was bound as a solid—calomel (Hg_2Cl_2). This had to do with the specific chemistry of the ores of Po-

tosí that were rich in chlorides and sulphides. If Guerrero is correct this does not mean that mercury was not contaminating the environment of Potosí, only that it was doing so through the waterways rather than through the air. Waterborne dispersion would have adopted different patterns of deposition and thus of uptake by the local populace. Robins notes a forthcoming study of contemporary soil samples in Huancavelica and Potosí—this will no doubt help clarify things further.

These observations are really only made with future research and analysis in mind. The book itself is a distinguished contribution to the polemic on mining, colonialism, and socio-environmental degradation. It will make for a strong addition to undergraduate and graduate lists. Robins’s synthetic skills, the descriptive richness of the historical source work, the verve of the writing, and the passion of the argument, all combine to make *Mercury, Mining, and Empire* a book to be reckoned with.

Note

[1]. Bartolomé de Las Casas, *The Devastation of the Indies: A Brief Account*, trans. Herma Briffault (Baltimore: Johns Hopkins University Press, 1992), 31.

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