Matthew James Crawford. The Andean Wonder Drug: Cinchona Bark and Imperial Science in the Spanish Atlantic, 1630-1800. Pittsburgh, Pennsylvania, University of Pittsburgh Press, 2016. xi, 284 pp., illus. $45.

Reviewed by Linda A. Newson, PhD, Institute of Latin American Studies, School of Advanced Study, University of London, Malet Street, London WC1 7HU

Much has been written about the discovery and adoption of the bark of the cinchona tree, known as *quina*, for the treatment of malaria. Most of these studies take a traditional narrative approach beginning with Europeans' first encounter with the product in the Andes in early seventeenth century and tracing its development to its present day status as a global prophylactic. Matthew Crawford's study covers a more limited time period, primarily the eighteenth century, and he focuses not on the medicinal product *per se*, but rather he uses debates that surrounded the botanical characteristics and medicinal qualities of *quina* to throw light on the relationship between +science and empire. In this approach he employs the concept of an 'epistemic culture' and characterises the Spanish crown's approach to the acquisition and legitimisation of knowledge as hierarchical and empirical.

The book is divided into two chronological sections that reflect important differences in the approach taken by the Spanish crown to the production of *quina*. Contrary to popular belief, the Spanish crown was slow to become actively involved in its commercialisation. In the first section, which covers the mid-seventeenth to mid-eighteenth centuries, Crawford shows how indigenous medical expertise and knowledge of cinchona underpinned the reputation of the southern Ecuadorian region of the Loja for producing the best quality *quina*. He situates its production within the region's local economy and shows how knowledge of the product was disseminated by local merchants and producers. Demand for the product expanded in part due to increased European contact with the malarial coasts of Africa that came with the expansion of the slave trade. It was the transformation of the product into a commodity that Crawford argues stimulated the Spanish crown to become actively involved in the production of cinchona and in 1751 establish a royal reserve at Loja aimed at producing *quina* for the Royal Pharmacy in Madrid.

The second section reveals the increasing efforts by the Spanish crown to assert its authority over scientific practice, but consistent with its emphasis on empirical testing was willing to entertain evidence from alternative sources. Hence conflicts emerged between pharmacists in Spain who chemically analysed the materials and were in a unique position to compare samples coming from different parts of the empire and thereby identify the best quality *quina*, and producers on the ground in Loja who asserted their superior knowledge of the product based on personal experience. Faced with declining sources of *quina* and conflicting views the Spanish crown expanded its pool of experts, particularly of botanists, with the aim of bolstering the authority of the Royal Pharmacy. Yet, it soon became clear that the production and trade of *quina* faced with practical obstacles, including sources of labour and the interests of local traders, as well as divergences in the views of experts, both in Spain and the Andean region, not only over the nature of the product, but over the support of free trade versus increasing royal control that was consistent with the Bourbon reforms. This section analyses in detail the interactions and correspondence between scientists in Madrid and the Andes, showing that it was not a simple conflict between the imperial centre and colonial periphery, but that there were also differences within communities of experts in both places. Thus the study concludes that the relationship between science and empire was not a simple but messy one that revealed the limited authority of the Spanish crown to acquire and validate knowledge in the face of pre-existing forms of knowledge production and the contradiction between authority and

empiricism that characterised its epistemic culture. Crawford prefers to see the relationship of science and empire was one of “coproduction.”

This volume differs in approach from standard accounts of the history of cinchona and Enlightenment botanical expeditions and scientists. It stresses the broader scientific, economic and political contexts in which the production and dissemination of scientific knowledge occurred, and occurs, and is particularly strong in inserting indigenous expertise and local networks into the process. If there is one criticism, it is that the Jesuits are scarcely mentioned. The Jesuits were important in the initial dissemination of the drug’s medicinal value and developed an extensive trade in *quina* both within South America and with Europe. After all, the drug was known as ‘Jesuits’ Bark’. What was the relationship of the Jesuits with local producers and what was the Crown’s view of their involvement in this trade, particularly in the run up to their expulsion from Spanish possessions in 1767?

The study is based on extensive archival research, especially in the Archivo Nacional del Ecuador and the Archivo General de Indias in Seville, whose sources have not hitherto been interrogated to the same depth for this purpose. The extent to which the archive of the Archivo del Real Jardín Botánico in Madrid has been exploited is not clear, but it would certainly be an important source to consult given that a number of prominent figures in the study, such as Casimiro Gómez Ortega, were employed there in senior administrative positions. It is engagingly written and well-illustrated.

Crawford’s scholarly study adds to our knowledge of the history of cinchona and of the Enlightenment, but probably its greatest contribution is to document in detail the relationship between science and empire through showing how knowledge was actually acquired and disseminated on the ground within specific economic and political contexts. It is a model for future studies of this kind and a significant contribution to understanding the nature of early modern science.