BOOKS: MEDICINE

More Bark Than Bites

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In *The Fever Trail*, Mark Honigsbaum, a writer for *The Observer*, takes the reader deep into the jungles of South America where he traces the steps of the Europeans who went searching for the source of quinine, the anti-malaria drug. He combines social and natural history, travel, and adventure in the form of a thriller, which is played out by the explorers who risked their lives to locate and collect seeds and saplings of the cinchona tree. Readers may find themselves itching and scratching as they follow a narrative rich in detailed accounts of numerous and persistent mosquito swarms along the banks of the Rio Negro, Casiquiare, and Orinoco rivers.

The Fever Trail
In Search of the Cure for Malaria
by Mark Honigsbaum
Farrar, Straus, and Giroux, New York, 2002. 341 pp. $25. ISBN 0-374-15469-4.

The Fever Trail
The Hunt for the Cure for Malaria
Macmillan, London, 2001. 363 pp. £18.99. ISBN 0-333-90185-1.

The search for the malaria cure is an interesting story with an uncertain beginning and an as-yet unhappy ending. The first reference to the cinchona tree dates to 1638, when the fourth Condesa de Chinchón, Doña Francisca Henriquez de Ribera, was reportedly cured from an intermittent fever in Peru with a native remedy provided by a Jesuit missionary. Whether or not the story is true, it inspired Linneaus to name the tree that produces quinine after the condesa. Even the great masters make mistakes though: Linnaeus left out the first "h" of chinchona, the first of many missteps in the plant's history. Linnaeus based his original (1742) description of *Cinchona officinalis* (the specific name denoting "storehouse of medicine") on incomplete material. When he expanded his account of the plant, he relied on a specimen (with flowers) sent to him two decades later. But, as Alexander von Humboldt showed in 1802, the samples represented different species.

Von Humboldt noted that the forms of the leaves, which had been considered important taxonomic traits, varied considerably even within the same species; their size and shape were strongly influenced by climate, elevation, and whether the trees grew in clumps or in isolation. Variations in the colors of cinchona leaves and bark, as well as extensive hybridization among similar taxa, added to the botanical complexity of the group. In 1867, one collector listed 143 "species," of which only one had a bark rich in quinine. At present, botanists recognize 15 to 23 members of the genus. The remote location of the plants' highland habitat—at high elevations in what were, during the 19th century, relatively inaccessible parts of the Andes—represented another major obstacle to early cinchona hunters.

The first attempt to export cinchonas to Europe, Honigsbaum writes, was made in the 1740s by Charles-Marie de La Condamine, a French mathematician sent to Quito to help test Newton's claim that Earth was an oblate spheroid. After he hauled a box of cinchona saplings and seeds down the east slopes of the Andes and along the Amazon River, his precious cache was washed overboard at Belém. In the years that followed, the failed attempts of other Europeans reinforced a popular belief that the tree was protected by an Indian curse. Andean Indians had, for generations, used quinine to reduce fevers, but it is not clear whether they knew about its antimalarial properties. South America had been malaria-free until the arrival of the Spanish, though Africa had almost certainly been malaria-ridden for centuries.

By the mid-19th century, the British military was very interested in quinine as a remedy for its disease-afflicted soldiers. Malaria was on the rise in several European countries and the United States, and the disease was slowing efforts at colonizing in Africa and Asia. In India alone, malaria claimed as many as two million lives a year. As the need for quinine was growing, cinchona forests were shrinking through the felling of the trees. When the forests started to disappear, the Dutch and British began to claim that it was their humanitarian duty to save this valuable plant by exporting it from the South American nations, which were attempting to preserve their lucrative monopoly.

Honigsbaum focuses on the details of how, in the name of philanthropy, European nations took cinchona from the New World and planted the trees in their colonies. The success of the enterprise rested on three Englishmen: Richard Spruce, a botanical expert who contracted malaria while collecting samples in Ecuador; Clements Markham, a geographer who lacked botanical knowledge but possessed crucial political connections; and Charles Ledger, a merchant who spent several years in South America and came to know more about cinchonas than anyone else. But the real hero of this tale happens to be Manuel Incra Mamani, a Bolivian Indian recruited by Ledger to assist in the search. Mamani's knowledge of cinchona and the friendship that developed between the two men enabled the British and Dutch to develop cinchona plantations in their Asian colonies. With these new sources, the malaria remedy became much more widely available, and the profitable trade of the South American nations was destroyed.

Calamitous collecting. The demand for quinine led to the destruction of cinchona forests as trees were felled for their bark, as in this view from Peru circa 1867.

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The author provides much less detailed coverage of more recent antimalarial efforts. He briefly discusses such topics as chemical derivatives of quinine, the pathology of malaria, public health measures, the rise of drug-resistant strains of the parasite, and ongoing attempts to develop an effective vaccine. Honigsbaum also sketches the complex relations among the malaria parasites and their insect and human hosts, and he comments on the economic costs of the disease and economic barriers to combating it with pharmaceuticals and insecticides. But this interesting and well-researched account remains centered on the adventures of its protagonists instead of the science.

The Fever Trail could not have a happy ending because malaria still kills 2 million people each year. Despite the benefits that followed from the exploits that Honigsbaum recounts, 40% of the world's population continue to live under the threat of the disease.

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