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J. R. McNeill. *Mosquito Empires: Ecology and War in the Greater Caribbean, 1620-1914*. New Approaches to the Americas Series. Cambridge: Cambridge University Press, 2010. 371 pp. \$90.00 (cloth), ISBN 978-0-521-45286-1; \$24.99 (paper), ISBN 978-0-521-45910-5.

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A Bite of History

It is astounding to consider that one of the largest factors in shaping the early modern Caribbean geopolitical environment was one of its smallest denizens. Yet that is exactly what J. R. McNeill argues in *Mosquito Empires*. In this learned and wide-ranging work, McNeill explores the role of the mosquito as a disease vector and its subsequent effect on how empires were gained, maintained, and lost in an era before the development of effective tropical medicine. From the decimation of malaria- and yellow fever-resistant native populations, the importation of African diseases and vectors, and the creation of mosquito-friendly landscapes to the role of disease in both protecting Spanish possessions in the Caribbean and in supporting revolutions against established powers, McNeill's arguments are well crafted, thought provoking, and often ingenious.

The central discussion of the work begins in chapter 2 with an examination of the greater Caribbean environment and ecology, which underwent drastic changes as Europeans moved in and established a sugar industry. Europeans brought with them, as a side effect of the transatlantic slave trade, the *Anopheles* and *Aedes* mosquito genera, identified as the primary carriers of malaria and yellow fever. These mosquitoes then flourished in transformed sugar landscapes that eliminated insect predators and created almost ideal habitats. In addition to the proliferation of standing water sources as a byproduct of cane field agriculture, the population explosion that accompanied the institution of large-scale plan-

tation operation provided a steady supply of hosts and carriers for both malaria and yellow fever. On the mainland of the Caribbean basin, and in the interiors of the Greater Antilles, thick vegetation, animal carriers, and swamps also provided habitats that encouraged the multiplication of disease-carrying mosquitoes.

After setting up the ecological context of yellow fever and malaria in the Caribbean, McNeill turns his attention in chapter 3 to an overview of the region's medical history with an emphasis on two key points. First, malaria and yellow fever were primarily deadly to newcomers who had no natural or acquired immunities to either disease, and second, white Europeans were disproportionately affected. With medical treatments largely ineffective in combating either malady, only terraforming through clear-cutting or swamp drainage remained as options, and both were too expensive. On the larger islands and on the mainland, locating military garrisons in highlands above the mosquito habitats could work, but this approach was often rejected for reasons of strategic necessity. The larger significance of this chapter is to frame the context of the next four chapters, which form the heart of McNeill's study. Based on his propositions that malaria and yellow fever were prevalent in the greater Caribbean; that they most often affected white European newcomers; and that there existed no practical remedies, either medically or environmentally, to the problem, he is poised to discuss the geopolitical ramifications of the unique Caribbean disease environment.

To demonstrate the malignancy and effect of yellow fever, McNeill uses chapters 4 and 5 to engage in a comparative study of the Caribbean region before and after the advent of widespread disease and explores the ramifications of his findings. He argues that the Dutch experience in Brazil between 1624 and 1654 and the first five years of the English in Jamaica (1655-60) demonstrate that where yellow fever had not taken hold, relatively healthy environments ensured that white Europeans, even new arrivals, were not in any substantial danger. However, the Scots at Darien toward the end of the seventeenth century highlight the devastating disease environment that emerged in the interval. McNeill adds the deadly experience of the French in Guiana in 1763 to strengthen this claim. No longer would European newcomers enjoy an environment essentially free of mosquito-borne disease. In itself, this would make an interesting historical study, but McNeill's conclusions are far more ambitious. He argues that the explosion of yellow fever epidemics in the greater Caribbean served as Spain's most effective weapon in defending their New World possessions.

The rise of plantation slavery, in addition to creating suitable habitat for mosquitoes, also required the maintenance of large military garrisons composed of local men to defend against possible uprisings. Thus, the very soldiers that the French, English, or Dutch might have relied on to survive military operations in disease zones were not generally permitted to depart their home islands. Instead, whenever Spain's European rivals required a sizable assault, they recruited European-bred troops who were little more than "luckless virus-fodder" (p. 143). Thus a French attack on Cartagena in 1697 suffered terribly, and English attempts at both Cartagena in 1741 and Havana in 1762 met disaster at the hands of yellow fever. In an ironic twist, however, the same disease environment that safeguarded Spain's New World possessions proved their undoing when revolution visited in the nineteenth century.

Part 3 of *Mosquito Empires*, cleverly titled "Revolutionary Mosquitos," shows how insurgents challenged the existing imperial order in the Americas and succeeded in large part through the aid of disease. In McNeill's estimation, the ravages of malaria in the southern United States did as much or more to defeat Lord Cornwallis during the American Revolution as did colonial resistance, while France's loss of St. Domingue to a slave revolt came largely through the helpful offices of the mosquito; massive yellow fever outbreaks destroyed both French and British armies sent to recover the island.

When Spanish America erupted in revolution in the early 1800s, many local disease-resistant troops sided with rebellion, leaving Spain no choice but to resort to European recruits who succumbed to disease just as haplessly as their British and French counterparts of the previous century.

The core, and indeed the value of, McNeill's work is built around these three provocative scenarios that he maintains might have turned out very differently if not for a mosquito-borne disease environment. While at the outset he claims that his work is not quite "an essay in mosquito determinism, or even environmental determinism," the case that he makes in chapters 4-7 quite convincingly argues against that assertion (p. 6). And if, as McNeill readily admits might happen, the study might be, against his protests, perceived as an exercise in determinism, the thesis is so well crafted and the conclusions so readily apparent that one might wonder what is wrong with such an approach in this case. After all, much of the ground that McNeill covers is not new information. No conscientious scholar or teacher would, for example, fail to mention the role disease played in the success of the Haitian Revolution. By taking the Caribbean disease environment as a whole and examining it over a lengthy stretch of time, however, McNeill shows us that the Haitian example is just one event in a much larger pattern. And although perhaps it may not have been his intention to present the deterministic case so forcefully, at the end of the day, the reader can only imagine just how different the geopolitical makeup of the Caribbean, and indeed, North America, might have looked had mosquitoes not played the prominent role McNeill assigns them.

Mosquito Empires makes a notable contribution to the body of environmental history centered on the Caribbean. Consideration of the environment as a causal factor in the historical development of the West Indies emerged in the 1990s with David Watts's *The West Indies: Patterns of Development, Culture, and Environmental Change* (1990), and the work of Richard Grove, most notably, *Green Imperialism: Colonial Expansion, Tropical Island Edens and the Origins of Environmentalism, 1600-1860* (1995). Both authors emphasize changes in the land (reminiscent of William Cronon's 1983 work *Changes in the Land: Indians, Colonists, and the Ecology of New England*) wrought primarily through human activity, changes that had an impact on the culture and economy that followed. Matthew Mulcahy's *Hurricanes and Society in the British Greater Caribbean, 1624-1783* (2006), like *Mosquito Empires*, shifts the locus of environmen-

tal factors from humans to nature, and represents the best of recent scholarship to do so. In this context, McNeill makes a significant contribution to the evolution of the subgenre that first emphasized the effect of human agency on the land. In doing so, neither McNeill nor Mulcahy (nor indeed their predecessors) seek to submerge more prominent lines of inquiry in Caribbean history, such as plantation slavery, the role of piracy, or liberation and identity studies, but rather present a vital factor that should be considered alongside these more traditional approaches in evaluating the region from a historical perspective.

In a final bit of historical irony, *Mosquito Empires* might be compared to Jared Diamond's *Guns, Germs, and Steel: The Fates of Human Societies* (1998). If it is proper, as Diamond argues, to assign a leading role to disease in the European conquest of the Americas, then McNeill completes the circle by demonstrating how disease ultimately defeated Europeans in the same area. In the interval, of course, much changed, and the newly liberated countries of the Americas in many respects owed more socially and culturally to European and even African origins than to pre-Columbian societies; yet it is interesting to note that disease played a significant part in both winning and losing the Americas for European powers.

Mosquito Empires should appeal to a broad range of readers. Its greatest strength, aside from the lucid and persuasive arguments it makes, is McNeill's masterful handling of large and complex events. Understanding the

importance of disease in the development of the greater Caribbean requires understanding the larger context in which yellow fever and malaria operated, and it is in this area that *Mosquito Empires* truly shines. McNeill's summaries of key social and political aspects are detailed without being overbearing, and his presentations of such topics as the nineteenth-century Latin American revolutions are concise and to the point, distilling the complexities into easily manageable summaries that allow the reader to grasp important contextual information without losing sight of the main thrust of the work. For this reason as much as any other, *Mosquito Empires* is more than suitable for upper-division university courses that cover environmental, Caribbean, or Atlantic histories, and perhaps even ambitious lower-division world or Atlantic history courses. Students and professors in graduate courses will also appreciate the clarity of McNeill's writing (when so much of the material is dry, turgid, and overly obtuse) as well as its usefulness in engendering discussion and debate. Scholars in the various fields touching the Caribbean will find much to enjoy, assess, and perhaps even disagree with, while those working in environmental history outside the Caribbean should likewise appreciate McNeill's approach. Wherever a reader chooses to place the role of disease in shaping the history of the greater Caribbean region, and even if one is tempted to suggest that McNeill protests too much on the subject, the arguments and conclusions of *Mosquito Empires* should not be ignored, and deserve a hearing in any assessment of the historical forces that shaped the West Indies.

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