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Reading between the Lines

> The name of the game will be to leave the boundaries open and to close them only when the people we follow close them.
>
> Bruno Latour[1]

THE DEATH OF DR. VOGEL

When the combined interests of commerce, abolition, and exploration catalyzed British support for the massive Niger Expedition of 1841, the ambitious Theodor Vogel managed to get himself appointed to the distinguished post of chief botanist.[2] It was a minor coup. The young Prussian had never actually been to the tropics. In fact, he had never been any closer to West Africa than western Germany, where the nearest thing to the tropical Niger was the distinctly temperate Rhine.[3] Nor had he much exposure to West African flora. His expertise was based on the study of a Brazilian collection conveniently ensconced in a herbarium in Berlin. But

[1] Bruno Latour, *Science in Action: How to Follow Scientists and Engineers through Society* (Cambridge, MA: Harvard University Press, 1987), 175.

[2] The following account is taken from a combination of Vogel's botanical and private journals, large sections of which are reproduced in *Niger Flora; or, An Enumeration of the Plants of Western Tropical Africa, Collected by the Late Dr. Theodore Vogel, Botanist to the Voyage of the Expedition Sent by Her Britannic Majesty to the River Niger in 1841, under the Command of Capt. H. D. Trotter, R. N., &c.*, ed. W. J. Hooker (London: Hippolyte Bailliere, 1849).

[3] Parts of which were as likely as not to freeze in the winter, as observed by the seventeenth-century Jesuit Athanasius Kircher and described in John Glassie, *A Man of Misconceptions: The Life of an Eccentric in an Age of Change* (New York: Riverhead Books, 2012), 27–30.

that was enough – and it was a measure of just how coherent the tropics now were in the minds of European naturalists: where expertise was concerned, plants collected from the expansive Brazilian interior could stand in for those that lined a discrete corner of the sub-Saharan world.

By the time he reached the yawning delta of the Niger, after layovers spread from Funchal to Accra, Vogel had assembled a collection of plants so numerous that they crowded him out of his cramped stateroom. The sweltering climate, he griped, made his specimens "fall to pieces and mold continuously."[4] He preserved as many of them as possible in his journal, its pages a thicket of binomial nomenclature: *Tamarix senegalensis*, *Cassia obovata*, *Elais guineensis*, *Sarcocephalus esculentus*, *Anona muricata*.[5] Had he lived, the ambitious young doctor would have consolidated his reputation as an authority on the distinctive botany of the immense tropical world.

But of course, he did not live. "Tropical fevers," Vogel wrote, worried everyone on the expedition.[6] His colleagues in medicine thought these fevers were the result of the combined heat, humidity, and dense vegetation of the tropics. Widespread putrefaction, they believed, caused miasma – the pernicious, earthy exhalations of mist and haze that seemed to pervade the tropics. How, exactly, miasma caused fevers, what the differences were between them, and how each should be treated were among the questions then driving medical transformations within metropolitan Europe.[7] In Europe's expanding tropical colonies, fevers were so ubiquitous, so baffling, and so virulent that, in clinical terms, subtle distinctions could often seem meaningless.[8] By all accounts, tropical fevers were deadlier than most.

Vogel's fever began on September 6, far up the Niger, only days from his destination at the confluence of the Benue. Over the following weeks, his condition grew worse. By September 18, he could muster little more than clipped sentences and tortured grammar. "I continue unwell" he

[4] Hooker, ed., *Niger Flora*, 11.
[5] Hooker, ed., *Niger Flora*, 24–37. These are, respectively, salt cedar, senna, African oil palm, Guinea peach, and soursop.
[6] Hooker, ed., *Niger Flora*, 17.
[7] A classic statement is Michel Foucault, *The Birth of the Clinic: An Archaeology of Medical Perception*, trans. A. M. Sheridan (New York: Pantheon Books, 1973 [1963]). Perhaps the best recent survey is Christopher Hamlin, *More Than Hot: A Short History of Fever* (Baltimore, MD: Johns Hopkins University Press, 2014).
[8] Philip D. Curtin, *Death by Migration: Europe's Encounter with the Tropical World in the Nineteenth Century* (New York: Cambridge University Press, 1989).

wrote, "head-ache and fever."[9] His ship turned downstream, headed for the sea, and a safe harbor on the island of Fernando Po.

At just over three degrees and three minutes north latitude, and tucked deep into the Gulf of Guinea, Fernando Po (now Bioko, Equatorial Guinea) sits almost exactly on the equator, in the very heart of the tropics. There, in Clarence Cove, Vogel spent the last ten weeks of his life – bedridden, febrile, and delirious. His botanical collection was brought ashore where it was variously invaded, occupied, and purloined by an assortment of unspecified bugs. Vogel mused that he had turned from gathering plants to collecting insects.[10] On December 17, 1841, amid his dwindling collection and an insurgent nature, Theodore Vogel, chief botanist of the British Niger expedition of 1841, "succumbed," as one of his colleagues put it, "to the destructive influence of the climate."[11] His death helped mark the disastrous conclusion to one of Victorian Britain's most ambitious West African ventures.[12]

It did not take a tropical botanist to understand something of the world that Vogel confronted. For many in nineteenth-century Europe and the United States, the tropics could be found almost anywhere. Empires actual and aspirational (the United States had no formal tropical holdings until 1898[13]) had already begun to bring the tropics home. Plants, animals, objects, and people from across the tropical world had become the subjects not only of specialized inquiry but also of general public fascination. Crowds at Kew marveled at enormous Amazonian lilies; rhododendrons from India lined a park near the Thames.[14] The Berlin

[9] Hooker, ed., *Niger Flora*, 61, 69. The emphasis in the latter appears in the original.
[10] Hooker, ed., *Niger Flora*, 72. [11] Hooker, ed., *Niger Flora*, 1.
[12] Hooker, ed., *Niger Flora*, vii–ix; Philip D. Curtin, *The Image of Africa: British Ideas and Action, 1780–1850*, 2 vols. (Madison, WI: University of Wisconsin Press, 1964); Daniel R. Headrick, *The Tools of Empire: Technology and European Imperialism in the Nineteenth Century* (New York: Oxford, 1981); David Lambert, *Mastering the Niger: James MacQueen's African Geography and the Struggle over Atlantic Slavery* (Chicago, IL: University of Chicago Press, 2013).
[13] American geopolitical ambitions during and after the early Republic are surveyed in Michael Adas, *Dominance by Design: Technological Imperatives and America's Civilizing Mission* (Cambridge, MA: Belknap Press, 2006), the notes to which reference an array of more specialized studies in both the Pacific and the Caribbean. According to Hooker, ed., *Niger Flora*, 33, Vogel noted an already-ambiguous political relationship between the United States and Liberia during his short stay in Monrovia.
[14] Richard Drayton, *Nature's Government: Science, Imperial Britain, and the Improvement of the World* (New Haven, CT: Yale University Press, 2000), chapter 6; and, more broadly, Beth Fowkes Tobin, *Colonizing Nature: The Tropics in British Arts and Letters, 1760–1820* (Philadelphia, PA: University of Pennsylvania Press, 2005).

zoo filled with monkeys and giraffes, while pythons and parrots were hawked in the back alleys of Hamburg.[15] Parisians paid to ride pachyderms. In the woods of Maine, Americans hunted them. Crowds in Washington eyed the cranium of a Fijian "chief"; live "Nubians" captured the Parisian public's attention.[16] Meanwhile, traveling menageries sporting tropical creatures – zebras, hippos, and rhinos – toured between New York, Boston, and Philadelphia.[17] The spoils of empire were, by turns, signs of affluence, measures of metropolitan reach, symbols of imperial power, and emblems of colonial mastery.[18]

Such public displays juxtaposed tropical objects and dramatized tropical difference – and the tropics were not just different, they were pathologically so. Tropical heat and humidity seemed to pervert human nature, excite the passions, and damage the intellect. Unchanging climates and vegetable abundance obviated daily labor and left time for intercourse verbal and otherwise. Tropical inhabitants were viewed as lazy, lascivi-

[15] Nigel Rothfels, *Savages and Beasts: The Birth of the Modern Zoo* (Baltimore, MD: Johns Hopkins University Press, 2002), chapter 2; and Herman Reichenbach, "A Tale of Two Zoos: The Hamburg Zoological Garden and Carl Hagenbeck's Tierpark," in *New Worlds, New Animals: From Menagerie to Zoological Park in the Nineteenth Century*, eds. R. J. Hoage and William A. Deiss (Baltimore, MD: Johns Hopkins University Press, 1996), although the author makes the wildly inaccurate claim that recently arrived rhinoceroses were the first to come to Europe "since ancient times" (55). On the rhinoceros in Europe see, for example, Juan Pimentel, *El Rinoceronte y el Megaterio: Un ensayo de morfología histórica* (Madrid: Abada Editores, 2010); and Donald F. Lach, *Asia in the Making of Europe*, 3 vols. (Chicago, IL: University of Chicago Press, 1967), vol. 1, 169, 488, and 569, n. 398.

[16] Ann Fabian, *The Skull Collectors: Race, Science, and America's Unburied Dead* (Chicago, IL: University of Chicago Press, 2010), chapter 4; Michael A. Osborne, *Nature, the Exotic, and the Science of French Colonialism* (Bloomington, IN: Indiana University Press, 1994), 7, 115–116, 126.

[17] Michael A. Osborne, "Zoos in the Family: The Geoffroy Saint-Hilaire Clan and the Three Zoos of Paris," in *New Worlds*, eds. Hoage and Deiss, 39–41; Richard W. Flint, "American Showmen and European Dealers: Commerce in Wild Animals in Nineteenth Century America"; in *New Worlds*, eds. Hoage and Deiss, 98; and Vernon N. Kisling Jr., "The Origin and Development of American Zoological Parks to 1899," in *New Worlds*, eds. Hoage and Deiss, 112–113.

[18] Here I draw on a good deal of postcolonial scholarship. But the act of collecting as part of both personal and imperial self-fashioning was not a strictly European phenomenon and those who engaged in it, including British and French connoisseurs, did not necessarily draw such hard and fast distinctions as the scholarly dichotomy between "colonized" and "colonizer" might suggest. See Maya Jasanoff, *Edge of Empire: Lives, Culture, and Conquest in the East, 1750–1850* (New York: Vintage, 2005).

ous, unclean, and immoral.[19] Visions of unruly nature and debilitating illness fostered research programs and propelled global bioprospecting campaigns.[20] They helped legitimate imperial dominance and inspired techniques of colonial rule.[21] Metropolitan physicians identified diseases of the tropics. Medical geographers plotted them on their maps.[22] Colonial authorities outfitted themselves with pith helmets and quinine. They built hill stations and hydrotherapy spas, installed personal hygiene regulations and sanitation regimes. They separated the sick from the healthy and – after germ theory made it possible to map disease agents onto native bodies – they increasingly separated European settlers from indigenous inhabitants.[23] In the tropics, where the line between nature and humanity

[19] David N. Livingstone, "Tropical Climate and Moral Hygiene: The Anatomy of a Victorian Debate," *The British Journal for the History of Science* 32 (1999): 93–110; Alan Bewell, *Romanticism and Colonial Disease* (Baltimore, MD: Johns Hopkins University Press, 2003); Gavin Bowd and Daniel Clayton, "Tropicality, Orientalism, and French Colonialism in Indochina: The Work of Pierre Gourou, 1927–1982," *French Historical Studies* 28 (2005): 297–327; David Brody, *Visualizing American Empire: Orientalism and Imperialism in the Philippines* (Chicago, IL: University of Chicago Press, 2010).

[20] Lucile H. Brockway, *Science and Colonial Expansion: The Role of the British Royal Botanic Gardens* (New Haven, CT: Yale University Press, 1979); Helen Tilley, *Africa as a Living Laboratory: Empire, Development, and the Problem of Scientific Knowledge, 1870–1950* (Chicago, IL: University of Chicago Press, 2011); Philip D. Curtin, *Disease and Empire: The Health of European Troops in the Conquest of Africa* (New York: Cambridge University Press, 1998); Michael A. Osborne, *The Emergence of Tropical Medicine in France* (Chicago, IL: University of Chicago Press, 2014); and Abena Dove Osseo-Asare, *Bitter Roots: The Search for Healing Plants in Africa* (Chicago, IL: University of Chicago Press, 2014).

[21] Osborne, *Nature, the Exotic, and the Science of French Colonialism*; Richard H. Grove, *Green Imperialism Colonial Expansion, Tropical Island Edens and the Origins of Environmentalism* (New York: Cambridge University Press, 1995); Mark Harrison, *Climates and Constitutions: Health, Race, Environment and British Imperialism in India, 1600–1850* (New York: Oxford University Press, 1999); David Arnold, *The Tropics and the Travelling Gaze: India, Landscape, and Science, 1800–1856* (Seattle, WA: University of Washington Press, 2006); Alice L. Conklin, *In the Museum of Man: Race, Anthropology, and Empire in France, 1850–1950* (Ithaca, NY: Cornell University Press, 2013).

[22] David Arnold, ed., *Warm Climates and Western Medicine: The Emergence of Tropical Medicine, 1500–1900* (Atlanta, GA: Rodopi, 1996); Nancy Leys Stepan, *Picturing Tropical Nature* (Ithaca, NY: Cornell University Press, 2001).

[23] Dane Kennedy, *The Magic Mountains: Hill Stations and the British Raj* (Berkeley, CA: University of California Press, 1996); Eric T. Jennings, *Curing the Colonizers: Hydrotherapy, Climatology, and French Colonial Spas* (Durham, NC: Duke University Press, 2006); David Arnold, *Colonizing the Body: State Medicine and Epidemic Disease in Nineteenth-Century India* (Berkeley, CA: University of California Press, 1993); Warwick Anderson, *Colonial Pathologies: American Tropical Medicine, Race, and Hygiene in the Philippines* (Durham, NC: Duke University Press, 2006); Mariola Espinosa, *Epidemic*

seemed to collapse, installing that and other boundaries became keys to survival. The whole region was to be tamed by European and American science, medicine, technology, and discipline.

EMPIRES AND THEIR TROPICS

The tropics have been central to Western political, cultural, and intellectual life for centuries. From the pre-Romantic fiction of Daniel Defoe's *Robinson Crusoe* to the structural anthropology of Claude Lévi-Strauss, and from bygone debates over miasma to vector-based models for the transmission of disease, the tropics have remained constant – a single coherent region defined by two essential features: profuse and unruly nature, and debilitating febrile illness.[24]

That was not always so. This book, in its broadest terms, is about the birth of that perspective – about how a single, coherent, global region now called "the tropics" was first conjured into being. Much like Fernand Braudel's "Mediterranean," Edmundo O'Gorman's "America," or Edward Said's "Orient," "the tropics" is a historical artifact[25] – a totalizing spatial framework cobbled together and made to seem natural as a consequence of centuries of European empire.[26] Hollywood movies (such as *Outbreak*) and science fiction novels (most famously, *The Hot Zone*) no less than academic specializations (from tropical medicine to

Invasions: Yellow Fever and the Limits of Cuban Independence, 1878–1930 (Chicago, IL: University of Chicago Press, 2009); John W. Cell, "Anglo-Indian Medical Theory and the Origins of Segregation in West Africa," *American Historical Review* 91 (1986): 307–335.

[24] That was true even as nineteenth-century observers quarreled over how best to gauge coherence and readily conceded the fact of internal variation. See Warwick Anderson, "Climates of Opinion: Acclimatization in Nineteenth-Century France and England," *Victorian Studies* 35 (1992): 135–157; and David Arnold, "'Illusory Riches': Representations of the Tropical World, 1840–1950," *Singapore Journal of Tropical Geography* 21 (2000): 6–18.

[25] Fernand Braudel, *The Mediterranean and the Mediterranean World in the Age of Philip II*, 2 vols., trans. Siân Reynolds (Berkeley, CA: University of California Press, 1995 [1949]); Edmundo O'Gorman, *La invención de América* (Mexico City: Fondo de Cultura Económica, 1986); Edward Said, *Orientalism*, (New York: Pantheon, 1978).

[26] As is the case with globalizing perspectives generally, according to Martin W. Lewis and Kären E. Wigen, *The Myth of Continents: A Critique of Metageography* (Berkeley, CA: University of California Press, 1997).

evolutionary biology) continue to normalize the concept.[27] Yet it has never been merely a reflection of the natural order of things and there was nothing inevitable about its creation.

The origins of the tropics lay in the ancient Aristotelian concept of the "torrid zone." By the mid-nineteenth century, these two terms had become virtually interchangeable. But whereas the tropics and the torrid zone refer to an identical area of the globe – one demarcated by the Tropic of Cancer north of the equator and the Tropic of Capricorn to its south[28] – they are not the same thing. The fundamental difference is environmental. The tropics brim with life; the torrid zone, at least in the narrowest Aristotelian sense (beset with the searing intensity of the sun directly overhead), was bereft of it.[29]

How, when, and why these views were reconciled, and what was at stake when that happened, are principal concerns of this book. A dominant narrative shared by the histories of science, medicine, and geography alike date the invention of "the tropics" to European imperial pursuits at the end of the eighteenth century. The central figure in this account is Vogel's elder countryman, the Prussian Alexander von Humboldt, who, together with the botanist Aimé Bonpland, trekked through the Andes between 1799 and 1804. Humboldt had a predilection for instrumentation and measurement, and a penchant for lyrical descriptions of equinoctial vegetation. His travels, lyricism, and faith

[27] Priscilla Wald, *Contagious: Cultures, Carriers, and the Outbreak Narrative* (Durham, NC: Duke University Press, 2008), chapters 1 and 4; and Gary Y. Okihiro, "Unsettling the Imperial Sciences," *Environment and Planning D: Society and Space* 28 (2010): 745–758. See also, for example, the widely-cited essay by the influential geneticist Theodosius Dobzhansky, "Evolution in the Tropics," *American Scientist* 38 (1950): 209–221. I thank Tito Carvalho for this reference.

[28] These lines mark, respectively, the northern- and southern-most positions at which it is still possible to observe the sun directly overhead. They presently correspond to 23 degrees and 51 minutes north and south latitude. Because the Earth's rotational axis itself rotates (the motion of precession: much like a spinning top, the Earth wobbles), the sun's apparent motion shifts over long spans of time and therefore the precise latitudes of the northern and southern tropics also shift.

[29] The classic statement appears in Aristotle, *Meteorologica*, trans. H. D. P. Lee (Cambridge, MA: Harvard University Press, 1952), bk. 2, pt. 5. For a discussion, see Denis Cosgrove, "Tropic and Tropicality," in *Tropical Visions in an Age of Empire*, eds. Felix Driver and Luciana Martins (Chicago, IL: University of Chicago Press, 2005), 199–202.

in precision measurement inspired similar intertropical itineraries.[30] Vogel's was among them.[31]

Humboldt gave short shrift to disease, although fever ("yellow fever" in particular) made its way into volume three of his widely read *Personal Narrative*.[32] He need not have said more. Imperial rivalries, renewed settler colonialism in Africa and Asia, the intensification of global trade, and the compilation of colonial health statistics had all begun to focus European attention on the problem of disease in many parts of the intertropical world.[33] The climate and vegetation that Humboldt helped make emblematic of that world always implied the presence of miasma

[30] Mary Louise Pratt, *Imperial Eyes: Travel Writing and Transculturation*, 2nd edn. (New York: Routledge, 2008), chapter 6; Hugh Raffles, *In Amazonia: A Natural History* (Princeton, NJ: Princeton University Press, 2001); Michael Dettelbach, "Global Physics and Aesthetic Empire: Humboldt's Physical Portrait of the Tropics," in *Visions of Empire: Voyages, Botany, and Representations of Nature*, eds. David Philip Miller and Peter Hanns Reill (New York: Cambridge University Press, 1996), 258–292; Malcolm Nicholson, "Alexander von Humboldt and the Geography of Vegetation," in *Romanticism and the Sciences*, eds. Andrew Cunningham and Nicholas Jardine (Cambridge: Cambridge University Press, 1990); John Hemming, *Naturalists in Paradise: Wallace, Bates, and Spruce in the Amazon* (London: Thames and Hudson, 2015); Stepan, *Picturing Tropical Nature*; Arnold, "Illusory Riches"; Driver and Martins, eds., *Tropical Visions*.

In addition, Aaron Sachs, *The Humboldt Current: Nineteenth-Century Exploration and the Roots of American Environmentalism* (New York: Penguin, 2006), credits Humboldt with shaping domestic American attitudes toward nature. The life and travels of the Prussian engineer-turned-explorer continue to inspire literature aimed at general audiences. See, for example, Andrea Wulf, *The Invention of Nature: Alexander von Humboldt's New World* (New York: Alfred A. Knopf, 2015); and Daniel Kehlmann, *Measuring the World: A Novel*, trans. Carol Brown Janeway (New York: Vintage Books, 2006).

[31] According to D. Graham Burnett, *Masters of All They Surveyed: Exploration, Geography, and a British El Dorado* (Chicago, IL: University of Chicago Press, 2001), 123, n. 21, Vogel would have been part of a community of expatriate Prussian naturalists who had gathered in London by the late 1830s.

[32] These are scattered throughout Alexander von Humboldt, *Personal Narrative of Travels to the Equinoctial Regions of the New Continent, during the Years 1799–1804*, trans. Helen Maria Williams, 3 vols. (London: Longman, Hurst, Rees, Orme, and Brown, 1814–1822), vol. 3, 32, 301, 310, 380–381, 387, 390–406, 466, 468. According to Nicolaas A. Rupke, "Humboldtian Medicine," *Medical History* 40 (1996): 293–310, his work also inspired a short-lived area of medicine.

[33] David Arnold, "Introduction: Tropical Medicine before Manson," in *Warm Climates*, Arnold, ed., 1–19; Mark Harrison, "A Global Perspective: Reframing the History of Health, Medicine, and Disease," *Bulletin of the History of Medicine* 89 (2015): 639–689; Daniel R. Headrick, *Power over Peoples: Technology, Environments, and Western Imperialism, 1400 to the Present* (Princeton, NJ: Princeton University Press, 2012); Curtin, *Death by Migration*; Curtin, *Disease and Empire*; Harrison, *Climates and Constitutions*; Stepan, *Picturing Tropical Nature*.

and therefore pervasive illness. As Humboldt's work found readers across Europe, and as the figure of the afflicted explorer became an icon of scientific heroism,[34] fever became the signal disease of the intertropical world. It was foremost among the ills that contemporary physicians began to identify as "diseases of warm climates." And in the 1880s, even as the emerging field of tropical medicine dispensed with environmental explanations in favor of germ theory and parasitology, fever remained the focus.[35]

Yet long before metropolitan readers began to immerse themselves in the ink of Humboldt's prodigious pen – before the extension of colonial empires in the nineteenth century, before the beginnings of English and French settlement in Asia and the Americas, decades even before the Columbian voyages of the 1490s – a tentative link had been drawn between intertropical latitudes, prodigious nature, and debilitating fevers. The connection came not as British, French, or Spanish ships sailed across the Atlantic to the Americas but as ships sailing under Portuguese auspices ventured southward, into the Atlantic, along the West African coast.

Beyond the Senegal River, the unexpected virulence of fevers amid verdant landscapes and abundant wildlife called into question a set of ancient and authoritative accounts of both nature and disease. Instead of the scorched and desolate landscape imagined by Aristotle, fifteenth-century travelers found one that was lush and verdant. Bountiful nature was supposed to be a sign of health and vitality. Yet travelers found themselves besieged by debilitating, often deadly, fevers. Seemingly irresolvable questions had been opened. What could explain the coincidence of fecund landscapes and virulent fevers? How could an entire region that

[34] Nigel Leask, *Curiosity and the Aesthetics of Travel Writing, 1770–1840* (New York: Oxford University Press, 2002); Christopher Lawrence and Michael Brown, "Quintessentially Modern Heroes: Surgeons, Explorers, and Empire, c. 1840–1914," *Journal of Social History* 50 (2016): 148–178; Johannes Fabian, *Out of Our Minds: Reason and Madness in the Exploration of Central Africa* (Berkeley, CA: University of California Press, 2000).

[35] Deborah J. Neill, *Networks in Tropical Medicine: Internationalism, Colonialism, and the Rise of a Medical Specialty, 1890–1930* (Stanford, CA: Stanford University Press, 2012); Michael A. Osborne, *The Emergence of Tropical Medicine in France* (Chicago, IL: University of Chicago Press, 2014); Michael Worboys, "Germs, Malaria, and the Invention of Mansonian Tropical Medicine: From 'Diseases in the Tropics' to 'Tropical Diseases,'" in *Warm Climates*, ed. Arnold, 181–207; Michael Worboys, "The Emergence of Tropical Medicine: A Study in the Establishment of a Scientific Specialty," in *Perspectives on the Emergence of Scientific Disciplines*, eds. Gerard Lemaine, Roy Macleod, Michael Mulkay, and Peter Weingart (The Hague: Mouton, 1976), 75–98.

was otherwise teeming with life be so inhospitable? And how could travelers survive in such bedevilling circumstances? Prevailing notions of miasma seemed unable to explain the problem. Familiar medicines seemed inadequate to resolve it. In environmental and epidemiological terms, fifteenth-century voyages into the Atlantic were as disorienting as later voyages across it.[36]

The proposition that intertropical lands might everywhere be endowed with profuse and exploitable nature would soon raise the stakes of exploration. Southerly sailing came to be seen as an asset by European statesmen and seafarers alike.[37] But in the closing decades of the fifteenth century, it was not at all clear that the situation in West Africa should be taken as characteristic of the entire intertropical world. The true extent of intertropical abundance remained unknown. The causes and distribution of fevers were uncertain. What in the postcolonial, biomedical present has come to seem self-evident was, for some two centuries, anything but so. The many disorientations provoked by fifteenth-century voyages, and the strategies devised by travelers to cope with them, are the subject of Chapter 2.

The history of the tropics is the story of what happened next. The Portuguese established colonies from sub-Saharan Africa to Southeast Asia and South America, enabling the earliest global comparisons of nature and disease across the vast intertropical world. From Malacca in Southeast Asia to Olinda and Salvador da Bahia in Northeastern Brazil, a loosely connected network of Portuguese physicians and apothecaries emerged. For the first time ever, persons with a common intellectual inheritance and similar training spanned the intertropical world. Everywhere, unfamiliar nature and debilitating fevers became a focus of colonial inquiry and vigorous debate. Yet in Portugal's colonies, encounters with nature and disease inspired a range of geographical imaginings. For physicians such as Garcia de Orta in India or Aleixo de Abreu in Brazil,

[36] With an emphasis on geography and cross-cultural encounter, a similar point has been made, for example, by Luís Filipe Barreto, *Descobrimento e renascimento: Formas de ser e pensar nos séculos XV e XVI* (Lisbon: Imprensa Nacional-Casa da Moeda, 1983); Fernández-Armesto, *Before Columbus: Exploration and Colonization from the Mediterranean to the Atlantic, 1229–1492* (Philadelphia, PA: University of Pennsylvania Press, 1987); and Alida C. Metcalf, *Go-Betweens and the Colonization of Brazil, 1500–1600* (Austin, TX: University of Texas Press, 2005), chapter 2.

[37] Nicolás Wey Gómez, *The Tropics of Empire: Why Columbus Sailed South to the Indies* (Cambridge, MA: MIT Press, 2008); Maria da Graça Mateus Ventura, ed., *Viagens e viajantes no Atlântico quinhentista* (Lisbon: Edições Colibri, 1996).