DEAD RECKONINGS:
DISEASE AND THE NATURAL SCIENCES IN PORTUGUESE ASIA AND THE
ATLANTIC, 1450-1650

by

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The following dissertation traces the convergence of science, culture, and politics in Portugal’s most important tropical colonies—Goa, India and Bahia, Brazil. It shows how contradictions between an idealized colonial order and the exigencies of settlement patterned debates over the practice of medicine and, in the process, redefined scientific authority, credibility, and the study of nature. This story began in the Atlantic, where the unexpected virulence of certain fevers along the West African coast challenged European ideas about the causes of disease. To survive, the Portuguese turned to indigenous medical specialists, often women. With colonization in Asia and the Americas, this practice intensified and grew more controversial. Hindu and Muslim physicians in Goa as well as Amerindian and, later, African-descended healers in Bahia mediated Portuguese access to local flora and its curative uses. The two zones of colonization differed, however, in fundamental ways. The comparative dimension of this project helps clarify
these differences so as to explain the emergence of particular kinds of medical interaction within each colonial setting. At the same, I argue that colonial medicine—as it took shape throughout Portugal’s empire—was always built upon a fundamental opposition that was inherent in the project of colonization itself: Portuguese communities became dependent on forms knowledge-making that they simultaneously sought to displace. At issue was the authority (and therefore power) that women and non-Christian peoples wielded in the production and verification of truth claims about the natural world. Hence in the colonies, the intertwined disciplines of medicine and natural history confronted tensions and ambiguities that distinguished them from their metropolitan counterparts. And this in turn fostered distinct ways of assembling intellectual communities, asserting claims to truth, representing both in print, and defending that work in the face of suspicion and accusation from colonial governors and Inquisition officials alike.
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## CONTENTS

Abstract  

ii  

Acknowledgements and Dedication  

iv  

List of Illustrations  

ix  

A Note on Spelling, Translation, and Abbreviations  

x  

Chapter 1: *Dead Reckonings*:  

*An Introduction*  

1  

Chapter 2: *Beyond the Senegal*:  

*The Enigma of Nature and the Birth of an Imperial Medical Infrastructure*  

17  

Chapter 3: *In Pursuit of a Legible Empire*:  

*Disease, Commerce, and Generations of Natural History*  

57  

Chapter 4: *Credibility Gap*:  

*Facts and Fictions of a Colonial Science*  

117  

Chapter 5: *Circulating Uncertainty*:  

*Doubt, Dissent, and the Taxonomy of Disease*  

155  

Chapter 6: *Disease, Medicine, and Natural History*:  

*Science in Portugal’s Empire*  

208  

Bibliography  

218
ILLUSTRATIONS

Figure 2.1. *The Portuguese in West Africa* 25
Figure 2.2. *Mappamundi of Juan de la Cosa* 36
Figure 2.3. *Anonymous Genoese Map from 1490* 38
Figure 3.1. *Portuguese Settlements and Major Ports of Trade in Asia* 59
Figure 3.2. *Goa and Its Environs from Tertia pars Indiae Orientalis* 68
Figure 3.3. *The Cantino Atlas* 77
Figure 3.4. *Ilha das Flores: An ensemble from Livro de Francisco Rodrigues* 79
Figure 4.1. *The Apothecary Tomé Pires on Betel Leaves* 138
Figure 4.2. *Detail of Goa from Tertia pars Indiae Orientalis* 145
Figure 4.3. *Detail of Apothecaries from Tertia pars Indiae Orientalis* 150
Figure 5.1. *Detail of Brazil on the Cantino Planisphere* 160
Figure 5.2. *Portuguese Settlements and Major Ports of Trade in Brazil* 171
Figure 5.3. *Portuguese Settlements and Major Ports of Trade in southern Africa* 191
Figure 5.4. *The Architecture of Uncertainty: the Title Page from Abreu's Tratado* 202
ON SPELLING, TRANSLATIONS, AND ABBREVIATIONS

Portuguese orthography is notoriously irregular. In the pages that follow—and with occasional exceptions—I have changed the spelling and accentuation of various Portuguese words to correspond to the guidelines set forth in the orthographic accord of 1990. For personal names, I have generally followed the spelling currently used to catalog materials at the Biblioteca Nacional de Portugal in Lisbon. Where Spanish is concerned, I have—again, with some exceptions—followed the Diccionario Real de la Lengua Española. All translations are my own unless otherwise noted. Where the Spanish Hapsburgs are mentioned, I have followed convention and used the anglicized version of their names, with roman numerals indicating their succession in the Spanish line (so I use “Philip II” not “Felipe I”).

AHU Arquivo Histórico Ultramarino
ANTT Arquivo Nacional / Torre do Tombo
APO-CR Archivo Portuguez-Oriental—Cunha Rivara
CA Cartas Avulsas
CC Corpo Cronológico
CJ Cartório Jesuitico
MB Monumenta brasiliae
POE Portuguese Oceanic Expansion
RHGB Revista do instituto historico geografico brasileiro
Dead Reckonings
An Introduction

Our ordinary words are much subtler in their uses, and mark many more distinctions, than philosophers have realized.

—J. L. Austin, Sense and Sensibility

I

Nearly every aspect of Portuguese imperial policy was linked to the twin problems of disease and population loss. Yellow fever and malaria struck down settlers in Portugal’s coastal African enclaves. Cholera decimated the Portuguese in India. And smallpox threatened to wipe out whole indigenous societies in South America. Lisbon responded with makeshift policies that had bizarre and unpredictable results. Portuguese criminals forced overseas to repopulate disease-ridden settlements became powerful colonists. The first governor of Portuguese Asia encouraged his soldiers to wed Hindu and Muslim women in hopes that intermarriage would lead to Christian settlements loyal to Lisbon.

3 Pearson, “First Contacts Between Indian and European Medical Systems: Goa in the Sixteenth Century,” Warm Climates and Western Medicine: The Emergence of Tropical Medicine, 1500-1900 (Atlanta: Rodopi, 1996), 20-41.
4 For the most recent discussion of these numbers see Alida C. Metcalf, Go-Between and the Colonization of Brazil, 1500-1600 (Austin: University of Texas Press, 2005).
But his plan had the reverse effect, for it gave impoverished Iberian shiphands valuable trade contacts. Consequently, countless Iberian men abandoned Portuguese settlements and instead joined Hindu and Muslim communities throughout the subcontinent. Young orphan women, who in Portugal were considered dishonorable and unmarriageable, were soon dispatched to India, East Africa, and Brazil, where (especially in East Africa) they became highly prized brides and powerful heiresses. In the Americas—where Christian conversion was used to justify imperial expansion—reports of widespread sickness and death among indigenous peoples threw into question the legitimacy of Portuguese rule. It also strengthened demand for the enslavement of Africans. Dependence on African slave labor in Brazil meant that Portugal—which was itself thinly populated—continued to ship people abroad to staff its coastal African trading posts, where malaria and yellow fever cut them down once more. And so it was that imperial administrators, faced with a lethal cycle begun by expansion and perpetuated by their own policies, could not but renew the circle of migration, illness, and death.

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7 On the policy of deportation see Coates, Convicts and Orphans. For the most outstanding example, see Maylin Newitt’s discussion of the donas of Mozambique in A History of Mozambique (Bloomington: Indiana University Press, 1995).


9 This pattern persisted at least to the late seventeenth century. One of Jesuit António Vieira’s most controversial proposals—the use of Jewish capital to finance a joint-stock company to revive Brazil’s sugar trade after Dutch aggression—was directly related to Brazil’s dependence
Forced deportations, widespread intermarriage, exploitive sexual encounters, brutal enslavement, and continued exposure to deadly illnesses were the upshot of policies aimed to perpetuate Portugal’s global commercial empire—policies that were, first and foremost, a response to disease and population loss. Yet as much as disease was a pressing concern for imperial administrators, it was of vital and far more immediate importance for the inhabitants of Portugal’s overseas colonies. It was in the colonies that the empire brought widely dispersed peoples and pathogens into more immediate and sustained contact than ever before. And as a result, Africans, Indians, Portuguese, and especially Amerindians faced the potential of disease and death on an almost seasonal basis.10

Strikingly, however, there is virtually no systematic analysis of the development of medicine in Portugal’s empire. Numerous studies point out that methods of healing were a point of contention in the colonies. But they focus on topics such as the spiritual, economic, social, or cultural life of the colonies.11 Research has addressed the activities of Portuguese physicians and apothecaries abroad but it privileges description and

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10 On Goa, see for example Pearson, “First Contacts,” 20-25; and for Brazil see Lourival Ribeiro, *Medicina No Brasil Colonial* (Rio de Janeiro: [s.n.], 1971).

narration over analysis. There are studies of institutions for which diagnosing and treating illness were central concerns: hospitals, households, religious confraternities, convents, plantations, and mission villages. But these explore the contributions of such institutions to the social and economic life of the colony.


13 The social and institutional histories that address India often discuss the entire empire so Brazil figures into the analyses of Coates, Convicts and Orphans; Alberto C. Germano da Silva Correia, História do Ensino Médico na India Portuguesa (Nova Goa: Imprensa Nacional, 1917); Isabel dos Guimarães Sá, Quanto O Rico Se Faz Pobre: Misericórdias, Caridade E Poder No Império Português, 1500-1800 (Lisboa: Comissão Nacional para as Comemorações dos Descobrimentos Portugueses, 1997); idem, “Catholic Charity in Perspective: The Social Life of
Here I invert that question. I explore the ways in which the social, economic, and religious life of the colonies framed the development of colonial medicine and shaped the production of natural knowledge more broadly.

II

So what? There are, to be sure, at least a dozen other recent studies of what has lately been termed “Iberian science.” But that is a designation that is at once both too capacious and too narrow. Most of these studies—the present one included—have taken a measure of their inspiration from the work of Jorge Cañizares-Esguerra. His 2004 article (and, before that, his award-winning book) drew attention to the longstanding disregard among North American historians and Anglophone scholars more generally for the scientific work carried out by early modern Iberians and their colonial collaborators from Macao and Goa to Mexico City and Lima. That charge was soon echoed with particular volume—especially by historians of colonial Latin America, who have since begun to write the history of science in the Iberian world. Often following Cañizares, this scholarship has not merely demonstrated the importance of Spanish and Portuguese Devotion in Portugal and its Empire (1450-1700),” e-Journal of Portuguese History 2 (2004): 1-19.


14 Cañizares on ignored how much longer.

colonial scientific investigations, it has argued for the transformative and even Revolutionary role of statesmen like the governor of Portuguese Asia Dom João de Castro and Spanish physicians such as Nicolás de Monardes.

Iberia and its colonies produced the Scientific Revolution, which only later took off in Europe north of the Pyrenees—that has been the general analytical heading that the field as a whole has charted ever since. And it is on precisely that point that the present study parts ways with the fleet. This is indeed an investigation of ‘science’ in Portugal’s empire, with a particular emphasis on medicine and natural history (and a bit of geography too as it has turned out). But it is not a project about the importance of either Portugal or its empire in the making of the ‘Scientific Revolution.’ I intend neither to lionize individual thinkers nor to diminish their remarkable work. My aim is more limited. I intend to demonstrate, first, that highly personal relationships and particular colonial concerns generated specific research questions (about diseases, the environments that produced them, and the medicinal plants that might be used to treat them) and, second, that those same relationships also supported particular ways of answering these questions.16

It is with this in mind that I argue that the term “Iberian science” is much too capacious to be analytically useful. There was unlikely to have ever been a single way of investigating nature (including disease and medicine) that was distinctly “Iberian” or, for that matter, even distinctly Spanish or Portuguese in the early modern era. Portugal,

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Spain, and their respective empires consisted of political, economic, social, and intellectual networks that were highly diverse. Each, I suggest, included multiple and competing ways of articulating and verifying truth claims about the inner-workings of the natural world. And in the colonies these were often as far removed intellectually as they were geographically from the social and cultural life of Spain or Portugal. Iberian rulers might have wanted to reproduce metropolitan society in their overseas colonies. But that was a practical impossibility. The colonies differed profoundly from their metropolitan capitals. But in trying to sew the histories of colonial sciences into the single grand narrative of Scientific Revolution, these differences get missed.17

In a similar way, the notion of an “Iberian science” is far too narrow and facile. The methods used to investigate nature in the early modern Western world were highly variable both within Spain and Portugal and across their respective empires. Everywhere, the investigation of nature was a varied endeavor. What took shape were a patchwork of related and overlapping, but nevertheless locally distinctive, methods for producing and verifying claims about what the natural world contained and how it worked. My suggestion—that all of these represented particular “cultures of natural history,” each a product of its own time and place—is hardly a novel one.18 Rather, even in many of the best studies of “Iberian science”—and, more broadly, in recent debates over the origins


of many modern sciences—it is simply a forgotten one.\textsuperscript{19} A survey of recent histories of science, however, can serve as a reminder: studies suggest that Spanish America, the northern Spanish Hapsburg realm, northern Italy, central France, and London could each lay claim to its own kinds of investigative concerns and practices. Some were commonly shared; others not so much. The work of the Arab physician Avicenna, for example, seems to have survived the denigration of medical humanists in most parts of the West.\textsuperscript{20} By contrast, the mechanical manipulations of nature for the purpose of producing claims to probabilistic facts seems to have gained particular purchase among a relatively small group of practitioners in and around London in the seventeenth century.\textsuperscript{21} Whatever important regional differences there were, the Pyrenees did not demarcate them.

III

At least one preliminary question remains: how can a study so deeply concerned with local particularity pretend to say something about scientific work across an entire empire? I have built the project around two case studies. Goa (in India) and a thin ribbon of settlements along the South American littoral that stretched south of Salvador da Bahia (in Brazil) were each the site of concerted Portuguese activity. Goa and Salvador in particular were the twin political, economic, and administrative centers of the Portuguese


\textsuperscript{20} Much of the reason lay in the fact that so many physicians were trained in Italy. See Nancy G. Siraisi, \textit{Avicenna in Renaissance Italy: the Cannon and Medical Teaching in Italian Universities after 1500} (Princeton, NJ: Princeton University Press, 1987).

overseas world. Through them, metropolitan Lisbon was linked to its colonies. And in their respective orbits, disease, commerce, and cross-cultural interaction underwrote the creation of two books. Garcia de Orta’s *Coloquios dos simples e drogas e cousas medicinais da Índia* (Goa, 1563) and Aleixo de Abreu’s *Tratado de las siete enfermedades* (Lisbon, 1623) each serve as a window into the lives, minds, and colonial milieus of their authors. Over the next five chapters I explore how the peculiar economies, medical exigencies, and patronage networks of two divergent theatres of colonial activity converged to fashion particular investigative programs and unique kinds of answers to different but equally pressing questions.

Chapter 1 begins in the Atlantic in the latter half of the fifteenth century. It was in this period that European sailors, traders, and explorers began under Portuguese auspices to sail down the Atlantic coast of Africa beyond the mouth of the Senegal River. The Senegal marked the transition between the Sahara Desert and the sub-Saharan grasslands, establishing a dichotomy in the minds and writings of many travelers of the period. From the Venetian Alvise da Cà da Mosto to Gomes Eanes Zurara, Duarte Pacheco Pereira, and João de Barros, chroniclers wrote that north of the Senegal the peoples of the Sahara were lean and that vegetation was sparse but that below it the people they met were strong and the landscape seemed lush and verdant. This was easily explainable within the framework of humoral pathology, which had for centuries (indeed, since the Hippocrates themselves wrote about it) associated natural abundance with good health. Portuguese writers therefore took the number, variety, and size of the plants and animals of an unfamiliar place as a measure of local health. As the lands beyond the Senegal were perceived as bountiful, so they were understood to promote good health.
Except for Barros, all of the authors mentioned above wrote glowingly of the excellent health to be found once ships sailed beyond the Senegal River. Barros was the first writer I have encountered to offer generalized assessment of the health of the West African coast that contradicts these earlier opinions—though expressions of doubt had been mounting for some time. In the first chapter I trace the development of this perspective. As it turned out, European encounters with the world beyond the Senegal patterned cross-cultural colonial encounters in several ways.

In the second chapter I turn to Goa to take on the elaborate mythology surrounding the Portuguese, New Christian physician Garcia de Orta. More than any other individual from the Portuguese colonial world, Garcia de Orta is credited with the creation of a systematic experimental program, which evinced the earliest manifestation modern empiricism and deductive reasoning. I argue that such an interpretation is untenable. Orta’s work and the book he produced were products of his time and place, and were neither more nor less revolutionary than the work of his colleagues elsewhere in Portuguese Asia or Western Europe. In Goa, I show how just as Arab and Indian merchants and traders were indispensable commercial intermediaries, so Arab and Indian healers became the most sought after medical specialists. In commerce and medicine alike, Portuguese knowledge of the natural world of South Asia was second-hand. Essentially, I attribute this to a common preoccupation with profitable commerce—one that resulted from the need of a thinly populated and impoverished kingdom to staff and finance a sprawling empire comprised of a network of commercial way stations. The consequence of this orientation was that for over four decades after their seaborne arrival in Asia, they knew little about the natural commodities in which they trafficked and even
less about their curative capacity. So for example even as pepper had become the cornerstone of commercial policy, opinion in both Lisbon and Goa as late as 1540 was still divided as to whether or not black and white pepper were the same and whether they came from the same plant. (They are and they do.) Similarly, the treatment of all manner of “fevers” (roughly identifiable as symptoms of malaria, dysentery, and cholera in Goa) remained largely an affair for Hindu vaidyas (practitioners of ayurveda; the Portuguese called them “panditos”) and Muslim hakims (yunani specialists). A better knowledge of nature—of the natural commodities in which they traded and of the medicinal plants upon which their health depended—served the interests of many Portuguese by subverting these forms of dependence and supported both metropolitan and colonial interests.

Garcia de Orta’s lengthy tome—the Coloquios—responded to a combination of medical and commercial interests. But to create a comprehensive compendium of natural knowledge, he had to break from many of the practices that had become conventional among physicians-cum-naturalists in Europe. These were of two general types: epistemological practices (on what basis he asserted the veracity of his claims) and representational practices (how knowledge was presented in his book). At the level of knowledge production, the confusing variety of nature, Orta’s lack of access to the points and ports of origin for many of the things he discussed, and his overwhelming dependence on the dubious reports of merchants (he frequently complained of adulteration and falsification), compelled Orta to take two decisive steps. First, he began to insist on the importance of first-hand experience in rendering truth claims. What kind of experience? Orta took physical features to be just as important as humoral
“complexions”—discerned through touch and taste and smell (these being the primary descriptors of Dioscorides and the basis of medieval classificatory schemes)—in establishing the identity of a plant. Second, although texts were also important, Orta often dismissed the revised editions of classical authors by such medical humanists as Niccolò Leoniceno or Jean Ruelle, whom he vehemently criticized. Instead, Orta favored the works of Arab physicians, especially the writings by and commentaries on Avicenna and Rhazes, which European naturalists increasingly viewed with skepticism or outright disdain.

On the representational level, in order to speak to the varied audience of Portuguese physicians, apothecaries, merchants, traders, and the entire casado community in Goa, Orta organized his text alphabetically by the common names of each plant in Portuguese (instead of in the names and languages in which they circulated, though he noted these too) and he wrote in Portuguese. Both the use of the vernacular and alphabetization had by the 1560s become increasingly outmoded among European naturalists. Finally, because of the nature of the networks upon which Orta depended and the state in which specimens of nature arrived to him, pictures were of dubious utility. Orta chose not to include them, though in Europe images had become indispensable in such texts. European naturalists took Orta’s book as authoritative, but only after the Dutch naturalist Clusius edited it according to the conventions of his own very different discursive community.

At both the level of knowledge production and representation, Orta’s work looked very much like a form of natural history that was a product of mid-sixteenth century Goa—a form of science with distinct practices that differentiated it from the work of
prominent European naturalists. My point is that Portuguese Goa had its own particular kind of scientific culture in which distinct conventions gained purchase.

I turn to a more thorough discussion of Orta’s handling of the issues of authority and credibility in Chapter 3. If non-Portuguese, non-Christian individuals mediated Orta’s access to, and knowledge of, nature then the best way for him to obviate their influence was to cultivate relationships with those very people—knowledgeable vaidyas, hakims, and others—so as to foster trust sufficient to give Orta the most reliable information possible about the places and things he could not see for himself. Those kinds of relationships, however, ran afoul of Goa’s most powerful secular and religious authorities. Because Orta’s associations suggested the influence on him of the alternate faiths of Hinduism or Islam, because Orta himself was known to be a New Christian and suspected of deviant religious practices, and because the Jesuits in particular had already begun to combine their proselytizing campaigns with their own investigations of Asian medicine, Orta’s work was fraught with tension and contradiction. While his credibility as an investigator and a truth teller about the things of nature depended on his associations with Hindu and Muslim healers, his life (and the wealth and well-being of his family), as well as his authority within the Portuguese community (few would take seriously the scrawls of a convicted heretic and his work would never have gained publication approval from Inquisitorial officials) demanded that he distance himself from those same kinds of people.

To make matters more complex and dangerous, some of the most common healers among the Portuguese in Goa were the “local” Goan (Konkani) women who worked as domestic slaves and servants and who therefore were not only knowledgeable about local
foods and *materia medica* but were also healers of first resort for all *casado* families. About these women there was among the Portuguese a deep suspicion, for they were thought to use their power (knowledge of local drugs) to seduce and kill Portuguese men and to rob the valuables of Goa’s wealthiest Portuguese *casado* families. I argue that these rumors reflect tensions arising from settlers’ ambiguous relationship to Goan women—dependent on them even as ethnic and gender norms marginalized them. They represented the most pervasive and intimate form of dependence that made the pursuit of the full range of natural knowledge useful to Portuguese settlers and officials in Goa a profoundly tendentious affair.

Orta needed to present his own natural knowledge as credible (quite literally worthy of belief) and himself as an authority (meriting attention, worthy of publication, and deserving of greater credence than others writers) while also distancing himself from the collaborators—Hindus, Muslims, and Konkani women—on whom he and his work depended. It was for this reason, I argue, that Orta chose to write the *Colóquios* as a dialog despite the genre’s having fallen out of favor by the 1560s among naturalists in Europe at work on similar projects.

The dialogue as a literary form became an instrument that helped Orta secure authority and establish credibility. It was effective for three reasons. First, unlike the plainly expository offering of conclusions, the dialogue allowed Orta to craft a portrait of intellectual exchange that modeled what he understood as a desirable mode of interaction with Asian physicians. Inquisitors (who, again, had to approve the book before its publication in Goa) need not imagine what might have transpired behind closed doors in the exchanges between Orta and non-Christian physicians. Orta showed them. He
portrayed himself as an orthodox Catholic, and distanced himself from Hinduism, Islam, and Judaism alike. Second, the dialogue allowed Orta to dissolve the boundary between reality and fiction. He could and did introduce and reference many characters whose presence in Goa is verifiable through other contemporary documents. But he also introduced characters whose existence is entirely unverifiable, including (among several others) the two most active participants in the dialogues—the fictional Spanish physician Dr. Ruano and Orta’s own house servant Antonia, on whom Orta relied at several points and whose existence is entirely plausible but whom other documentation on Orta, his family, and servants fails to mention. Third, the dialogue allowed Orta to expunge as much as possible from both public memory and the written record any view of his own family life as in any way deviant and of himself as anything less than an upstanding Portuguese Catholic casado. Other documentation reveals, however, that his own marital relations were strained, that Orta had contracted syphilis and transmitted it to his wife, and that he and his wife had separated. Thus the creation, presentation, and circulation of natural knowledge had to contend with the peculiar intellectual landscape of Portuguese Goa to which metropolitan commercial and religious ambitions helped give rise.

In the fourth chapter I retrace my steps, moving back to the Atlantic and in particular to Brazil, whose sugar—as the sixteenth century drew to a close—became increasingly important as a source of revenue for the Crown and for individual Portuguese. Brazil also became the favored destination for emigrants and overseas officials. I focus on the work of the physician Aleixo de Abreu, who resided in both Luanda (1594-1602) and Bahia (1602-1605). Based on that experience he published his Tratado de las siete enfermedades. In it Abreu expatiated upon the phenomenon of
disease in Portugal’s Atlantic colonies. The book was intended to serve as a reference for physicians and many others in Brazil and Luanda, who dealt with what appeared to be the peculiar colonial illnesses afflicting Iberians, Africans, and Amerindians alike. To interpret and explain a variety of different diseases, Abreu used his own body as a point of reference. He drew no distinction between his body and those of the African or Amerindian patients whom he treated. Hence for Abreu, human bodies were interchangeable. In his handling, the concept of the human body was a device to bring illnesses from throughout the dispersed Atlantic settlements into a unified field of view and within a single, intelligible framework. That was a controversial stance. It ultimately made it impossible for his work to circulate much beyond Lisbon. Abreu’s emphasis on the human body and bodily health was no accident. His was a science shaped by the concern for labor—a preoccupation of Atlantic colonists and Lisbon officials alike. Far more than in the Estado da Índia, Portugal’s Atlantic economy was built on settlement and slavery. Manual labor power and the bodily health that sustained it were concerns in the Atlantic in ways that they were not in Portuguese Asia. Whereas Orta was preoccupied with identifying commoditized nature, Abreu was concerned with sustaining commoditized bodies.

In the concluding chapter I attempt to draw out comparisons more systematically than in the individual case studies. I discuss patterns in the making of colonial science rather than argue for the transformative impact of particular thinkers. Finally, I address the differences in how medicine and natural history were manages in the Spanish and Portuguese empires.
Beyond the Senegal
The Enigma of Nature and the Birth of an
Imperial Medical Infrastructure

When, therefore, a physician comes to a district previously unknown to
him, he should consider its situation and its aspect to the winds . . . The
nature of the water supply must be considered . . . Then think of the soil . . . Lastly consider the life of the inhabitants themselves.

—Unknown author of *Airs, Waters, Places* (ca. third century BCE)¹

We walked along watching the river, which is of much and very good water . . . [and] there are many palms . . . with excellent palmitos . . .

And along the river walked many [natives] . . . [and] their bodies are so clean, so thick, and so beautiful . . . and it is the air . . . that makes them that way.

—Pero Vaz de Caminha’s letter on the discovery of Brazil (1500 CE)²

I

Malaria begins with chills, headache, nausea, and vomiting—soon accompanied by fever and heavy perspiration. Of these symptoms it was the fever that a handful of Jesuit missionaries took care to describe in their letters from Brazil in the mid-1550s. The fever, they noted, had peculiar characteristics, for it would vanish after a few days, leaving only mild symptoms in its wake; then a short time later it would surge again—every bit as acute as before. Luís de Grã and Brás Lourenço first complained of their

² Pero Vaz de Caminha, “Carta de Pero Vaz de Caminha,” in *Os sete únicos documentos de 1500, conservados em Lisboa, referents à viagem de Pedro Álvares Cabral* (Lisbon: Agência Gerald as Colónias, 1940), 56-57.
fevers at the beginning of the Lenten celebrations held in Bahia in 1555, noting that the fevers were “tertian” (*terçãas* or *terças*)—that they recurred every third day. Five years later, Grã contracted a “quartan” fever (*quarternaryo* or *quartãs*), which returned on every fourth day. Both men recovered but their colleague Diogo Jácome was less fortunate. One evening in April of 1565 Jácome finally succumbed to the quartan fever (*cartãs*) he had developed earlier that year. Fevers, it seemed, were an inescapable part of daily life in colonial Brazil.

When their reports began to filter back to metropolitan Portugal, the Jesuits had been operating in the colony for just over five years. Lourenço, Grã, and Jácome crossed the Atlantic under the leadership of Manuel da Nóbrega in 1549. Their landing was part of a broader imperial strategy. They came in the company of Tomé de Sousa, Brazil’s first governor-general, newly appointed by the Portuguese king, João III. The combined arrival of Crown and Church was meant to turn Portugal’s faltering and battle-weary coastal enclaves into a string of sustainable, lucrative, and devout colonies. French interlopers were to be driven from the coast and resistant Tupi-speaking natives were to be shorn of their faith and brought—gently if possible but forcibly if not—into the Catholic fold. Nóbrega wrote to his superiors soon after his arrival about the prospects for

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6 Alida Metcalf, *Go-Betweens and the Colonization of Brazil, 1500-1600* (Austin: The University of Texas Press, 2005), 119-155, has placed these Jesuits’ fevers within the broader context of imported epidemics in the colony.
Amerindian conversion. His letter conveyed all of the optimistic zeal of a determined young cleric in the Counter Reformation’s ambitious new missionary order. On the health of the continent that lay before him, Nóbrega was emphatic: he wrote, “There are no fevers here.” From the vantage point of Bahia five years on, his pronouncement must have looked strikingly naïve. At the time he wrote it, however, it was precisely the kind of appraisal that his Jesuit superiors and João III anticipated—a terse reiteration of the points made in the very first Portuguese letter from that coast fifty years earlier. Sailing with Cabral in 1500, Pero Vaz de Caminha was on his way to serve as a royal scribe in Cochin, on India’s Malabar Coast. It was Caminha who wrote to then king Manuel I of Cabral’s unexpected landfall in a western corner of the South Atlantic. Caminha’s was the letter that first fused the South American continent with images of natural abundance and superb health. Nóbrega’s report reflected a combination of Caminha’s imagery and the accumulation of rumor and opinion that had begun to circulate in Iberia in the intervening half-century. The letters from Lourenço and Grã—detailing their fevers and explaining Jácome’s untimely death—signaled the ebb of an epidemiological illusion: that the land the Portuguese called Brazil might somehow be free of debilitating illness.

All of these missives—Caminha’s included—reflected a longstanding Portuguese concern with the possibility of illness in unfamiliar places and, for Jesuits and other colonists overseas, an abiding preoccupation with the particular virulence of tertian fevers. Portuguese colonists never interpreted malarial fevers—be they tertian or

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9 Laura de Mello e Souza, *O diabo e a terra de Santa Cruz: Feitiçaria e religiosidade popular no Brasil colonial* (São Paulo: Companhia das Letras, 1986), 3-44.
10 Of course many of these diseases, malaria and yellow fever among them, were imports, though colonists did not know this. Metcalf, *Go-Betweens*, 119-155.
quartan—as differing manifestations of the same disease. They were not understood as symptoms of the bodily invasion of the malarial protozoa. Instead, they knew them as distinct ailments, as signaled by the unique periodicity of the fevers themselves. From the point of view of humoral pathology, fever was not so much a symptom as it was an illness. And among medical specialists throughout the Mediterranean at the time, fevers—as illnesses—were well known. They were a prominent topic in the medical texts that, by the sixteenth century, had long been required reading for university-trained physicians throughout western Christendom. Malarial fevers in particular were quite common and, of the four strains of malaria, two—*Plasmodium vivax* and *Plasmodium malariae*—could be found all across the Mediterranean basin. *P. vivax* caused a tertian fever that was unpleasant but often benign. The quartan fever, by contrast, was the result of *P. malariae* and was more dangerous. A third strain of malaria was far less common in the Mediterranean world and, before the early 1500s, predominated only in parts of tropical Africa. This was *P. falciparum*; it mimicked the tertian fever of *P. vivax* but was

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11 See for example the Hippocratic essays titled “Epidemics Book I,” “Epidemics Book II” and “Regimen and Acute Diseases” in Lloyd, *Hippocratic Writings*. For an overview of medieval European medical training see Lawrence Conrad, Michael Neve, Vivian Nutton, Roy Porter and Andrew Wear, *The Western Medical Tradition, 800 BC to AD 1800* (New York: Cambridge, 1995), 139-206. And on late-medieval Portuguese medicine see James D. Goodyear, “Agents of Empire: Portuguese Doctors in Colonial Brazil and the Idea of Tropical Disease” (PhD dissertation, The Johns Hopkins University, 1985), 74-78, 118-119. According to Goodyear, Coimbra University’s medical curriculum centered on the reading of the Hippocratic texts (in Latin or Portuguese) including *Aforismos*, *De ratione victus* and *Epidemicos e prognosticos*. Those by Galen or that were heavily Galenic included *Tegne e de locis affectis*, *De morbo et symptomate*, *De differentiis febrium*, *De simplicibus*, *De usu partium*, *De methodo medendi*, *De sanguinis missione*, *Ars curtiva ad Glauconem*, *Quos et quandro purgare conveniat*, *De crisibus*, *De diebus criticis*, *De naturalibus facultatibus*, *De pulsibus ad tirones* and *De inaequali intertemperie*. To these were added two essays by Avicenna and one from Rhazes. See Goodyear, 118-119.
much more virulent than either of the Mediterranean variants. When the Portuguese and other Europeans first ventured southward into the Atlantic, they did so with the understanding that quartan fevers were deadly but that tertian fevers, if treated properly, would subside. Their experience in West Africa gave the lie to this assumption. After exposure to \( P. falciparum \) along African littoral, the tertian fever could no longer be assumed to have the same mild consequences as before.

With Portuguese exploration, commerce, and pillage along the West African coast in the middle and late fifteenth century, the tertian fever became the ambiguous marker of a much more virulent disease; as a medical concept, the tertian fever had been thrown into disarray. The encounter with the natural world of the tropics thus challenged the conceptual apparatus of humoral pathology in at least one fundamental way. If Jesuit missionaries devoted so much attention to the periodicity of their fevers in the colony of Brazil in the 1550s, it was the consequence of Portuguese experience with the epidemiological environment of the African littoral that began over a century earlier. For Portuguese colonists in the tropical world, the prognosis for tertian fevers was far less certain than it had once been. And precisely because they could now be so much more lethal, identifying tertian fevers became a much more pressing concern. Hence, the story of Portuguese colonial medicine began with fifteenth-century exploration of the West African littoral—long before Iberian caravels crossed the Indian and Atlantic oceans.

For centuries after the beginning of overseas colonization, Europeans in the tropics would succumb to a range of diseases that were regularly diagnosed according to one commonly shared symptom: fever. Kenneth Kiple and Philip Curtin have both

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12 Frederick L. Dunn, “Malaria,” in Kenneth F. Kiple, *The Cambridge World History of Human Disease* (New York: Cambridge, 1993), 855-862. The fourth strain, \( P. ovalae \), does not figure prominently in the historiography of this period so I do not discuss it here.
remarked on the confusion this must have caused among early modern European physicians in tropical colonies. “Fever” came to encompass such a broad range of illnesses—malaria and yellow fever among them—that it was all but meaningless. And indeed, as the case of malaria indicates, in clinical terms the diagnosis could fail to facilitate a finer distinction between the different maladies of which it was a symptom, offering little guidance as to how the sickness could best be handled. But the letters penned by the first generation of Jesuits in Brazil reveal a more nuanced history. Although talk of disease was couched within the prevailing rubric of “fever,” diagnostic categories with more subtle clinical significance had already been established. Terms like *terças* and *quartãs* (again “tertian” and “quartan” respectively) became conventional ways of talking about fevers in tropical colonies, just as they had been in the Mediterranean. Contact with diseases associated with the tropical world, however, gave these distinctions new meaning.

The problem posed by early encounters with enigmatic illness, however, went beyond the uncertainty of tertian fevers. It was more basic. The experience of disease along the African littoral challenged a set of assumptions about the way that healthy places were supposed to look—about what kinds of flora and fauna characterized them and about how nature was therefore to be read for signs of health and illness. What the Portuguese seafarers found along the coast beyond the Senegal was a perplexing situation: a natural world that was at once brimming with flora and fauna and full of healthy people, but that

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seemed utterly inhospitable to themselves and their countrymen.\textsuperscript{14} As an abundant and apparently salubrious tropical world came to be associated with disease and death, it enabled the articulation—though often only implicit—of a set of shared research questions that would guide the otherwise disparate investigative activities of Portuguese physicians in India and the Atlantic. It also fostered the growth of the Portuguese imperial state, which financed an expansive and interconnected, if also thinly woven and frequently ruptured, network of medical institutions and staff.

II

Alvise da Cadamosto, the famed Venetian merchant-traveler, began the first of two well-known voyages to West Africa when, in March of 1455, he set sail from Cabo São Vicente in southern Portugal.\textsuperscript{15} It was late that spring when his ship first drew within sight of the African coast just north of Cabo Blanco, where the vast Sahara juts timidly into the Atlantic, forming a long, narrow peninsula.\textsuperscript{16} The scene made a strong impression on the young Venetian, who described the “very great desert” in the frankest of terms; it was “white, arid, and all equally low-lying.”\textsuperscript{17} Only many days later, when he arrived at the Senegal River, did the landscape before him finally and dramatically

\textsuperscript{14} While I am concerned here with shifting European perceptions of disease and the discussion has a certain disembodied aspect, these contacts of course often unfolded as part of cross-cultural encounters between various peoples. Herman L. Bennett “Text, Context, and the Early Modern African Subject,” \textit{Representations} 92 (2005): 16-41, offers a detailed and more embodied discussion of these interactions.

\textsuperscript{15} Alvise Cà da Mosto, “The voyages of Cadamosto: The beginning of the book of the first navigation by the ocean to the land of the Blacks of Lower Ethiopia at the command of the Illustrious Lord Infant Don Hurich, brother of Don Dourth King of Portugal,” in G.R. Crone, ed., \textit{The Voyages of Cadamosto and Other Documents on Western Africa in the Second Half of the Fifteenth Century} (London: Hakluyt Society, 1937). In the text, I use the popularized spelling of his name (“Cadamosto”) following Crone.

\textsuperscript{16} Cà da Mosto, 14-15.

\textsuperscript{17} Cà da Mosto, 16.
transform itself. The Senegal marks the southern boundary of the Sahara, where the desert meets the grasslands of the Sahel and where well-watered riverbanks yield dense, verdant foliage (figure 2.1). The banks of the Senegal presented such a contrast with the immense desert to its north that Cadamosto could not but be struck by it. His comparison of the lands and peoples on either side of the river is both stunning and revealing:

This river separates the Blacks from the brown people called the Azanaghi, and also the dry and arid land, that is, the above mentioned desert, from the fertile country of the Blacks. . . . It appears to me a very marvellous thing that beyond the river all men are very black, tall and big, their bodies well formed; and the whole country green, full of trees, and fertile; while on [the north] side the men are brownish, . . . lean, ill-nourished, and small in stature; the country . . . [is] arid.  

There is a strongly diagnostic quality to this passage: nature is abundant beyond the Senegal and the people there are healthy.  

Cadamosto was not alone in this opinion. Fifteenth-century travelers regularly affirmed that good health and natural abundance characterized the lands stretching south from the Senegal. Eight years before Cadamosto set out from São Vicente, an obscure traveler by the name of Antoine Malfante scribbled in Latin a letter from the Saharan oasis of Tuat. Malfante had intended to locate the fabled source of North African gold. His inquiries drew little more than vexing and unhelpful responses from those he met so

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19 This eighty-four page travel account has become an essential starting point for some of the most provocative debates in Atlantic and world history. Arguments over the roots of racism in the Americas, research into the characteristic patterns of European colonization, and inquiries into the effects of European expansion on West African economies have all taken Cadamosto’s account as an essential analytical starting point. No one, however, has offered an analysis of what is one of the most critical features of this document: the epistemology rooted in humoral theory that pervades the account from start to finish.

that the whereabouts of mines he sought remained a mystery. In the course of his description of the lands and peoples south of the Niger River, Malfante noted that “neither there nor here are there ever epidemics.” 21 In Lisbon at about the same time, the Crown-appointed historian of the kingdom of Portugal was preparing a manuscript that detailed his countrymen’s activities along the West African coast. In 1453 Gomes Eanes de Zurara published his work under the title *Chronica do descobrimento e conquista de

21 Malfante, 89-90.
Most of the text was given over to a triumphal narrative of what he termed Portugal’s “conquests” in the region. But Zurara digressed lengthily over the abundance and vitality of the lands beyond of the Senegal. He praised the “delicious” fruit, the tall green trees and, above all, “the pleasant scent of the air” which, like the freshwater flooding into the ocean from the Senegal itself, lingered along the shoreline, where Portuguese mariners smelled and drank of the area’s strange and exquisite nature.

Still more testimony on the area came in 1506 when Duarte Pacheco Pereira joined the ranks of those travelers who concluded in no uncertain terms that good health was to be found in the lands south of the Sahara. Pereira was a military hero of noble lineage. He not only possessed extensive experience at sea but had also traveled widely in South Asia. Pereira was highly regarded for his expertise in matters of maritime navigation and had written for Manuel I on the natural history of the world known to the Portuguese as of 1500. For Pereira the Senegal River marked the northern edge of “western Lower Ethiopia”—a vaguely defined but immense region that, according to this author, stretched south all the way to the Cape of Good Hope. “In Ethiopia,” Pereira confirmed, “no one dies of pestilence.” It was, he thought, hardly a revelation: the salubrity of “Ethiopia” was an established fact or, as he put it, “certain and known.”

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22 The version of Zurara’s account used here was transcribed from the manuscript housed at the National Library of France and published under the alternate spelling of Zurara’s name: Gomes Eannes de Azurara, Chronica do descobrimento e conquista de Guiné (Paris: J. P. Aillaud, 1841). The term “discovery” as employed by Zurara and his contemporaries bares careful interpretation. According to Francisco Contente Domingues, “Science and Technology” in Portuguese Oceanic Expansion, 1400-1800, edited by Francisco Bethencourt and Diogo Ramada Curto (New York: Cambridge University Press, 2007), 466, “‘to discover’ never means ‘to arrive for the first time.’”

23 Zurara, ch. 60: 277-278.


25 Duarte Pacheco Pereira, Esmeraldo de situ orbis, Augusto Epiphanio da Dilva Dias, ed. (Lisbon: Typographia Universal, 1905), bk. 1, ch. 37: 79-80. Unfortunately, Esmeraldo only
Yet there was already in the 1450s a creeping ambiguity in these accounts. Illness made its first appearance in Cadamosto’s record of his second voyage in 1456. South of the Senegal and up the banks of the Gambia River, Cadamosto and Diogo Gomes—a Portuguese pilot and member of the royal household—had been dispatched to negotiate an agreement with the area’s Mande traders. Cadamosto never mentioned any specific foreknowledge but word of illness in the region must have begun to circulate among seafarers, as Cadamosto confessed that he refused to eat the local dates “for fear of dysentery.”

Despite the precaution, some among his crew “began to suffer from a high fever [that was] sharp and continuous.” Cadamosto, Gomes, and a small Portuguese contingent “left suddenly” in order “to proceed to the mouth of the river,” and then made a fast retreat back to sea. This was an especially striking move in an age when the illnesses associated with shipboard life were already apparent. Among these sailors, the “sharp and continuous” fever, it seems, was associated with the land and they hoped that returning to the sea would remove them from its debilitating influence. The region was plainly becoming difficult to assess. But with the exception of this single misadventure, the lands remained verdant and salubrious in Cadamosto’s estimation. Illness beyond the Senegal in the 1450s was as yet something akin to the inexplicable and could still be relegated to the category of the anomalous. Almost three decades later accumulating reports of death from diseases associated with the African littoral had begun to spark

survives in the form of two copies from the eighteenth century, both of which are incomplete. See Domingues, “Science and Technology,” 464.

26 Cà da Mosto 69.
27 Cà da Mosto, 69.
28 Scurvy (escorbuto) and dysentery (camaras de sangue) were common ailments aboard ship. Scurvy, the result of a vitamin C deficiency, is not communicable. Dysentery, however, is the result of a pathogenic invasion. Francisco Contente Domingues e Inácio Guerreiro, A vida a bordo na carreira da Índia (século XVI), separata of the Revista da Universidade de Coimbra (Lisbon: Instituto de Investigação Científica Tropical, 1988).
concern among Portuguese imperial administrators. In 1480, when Afonso V consulted with royal advisors on the wisdom of building the São Jorge da Mina fortress, opinions on the wisdom of the project were divided because of what one chronicler described as the “ill effects of the climate.” Commercial ambitions trumped epidemiological concerns and the fort was built anyway. But a shift in perception had begun to unfold in which a natural world once associated with human health and physical vitality came increasingly to be associated instead with debilitating illness and death.

The transformation was not immediate. In the closing decades of the fifteenth century both views had become clearly discernible—each coexisted in tension with the other. Pereira’s 1506 treatise, the Esmeraldo de situ orbis, lay precisely at this critical juncture. The learned and well-traveled statesmen and natural philosopher was forced to double back on his own opinion. When he averred in no uncertain terms that “in Ethiopia no one dies of pestilence,” there was already so much evidence to the contrary that he was compelled—in the course of the same passage—to concede that the opposite also seemed to be true: at least some parts of coast past the Senegal, he wrote, were “unhealthy,” for they provoked “fevers.” Around Cabo das Palmas and near the fabled mines that lent the Gold Coast its alluring sobriquet, Pereira dryly noted that “white men die here.” And it was to “fevers” that Pereira referred when he explained that Portugal’s Catholic mission of conversion near the Mina castle was proceeding apace except for impediments owing to the “sickness of the land.”

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30 Pereira, bk. 1, ch. 27: 82 and bk. 2, ch. 1: 102.
31 Pereira, bk. 2, ch. 5: 114-115.
32 Pereira, bk. 2, ch. 5: 114-115.
pronouncements, Pereira simply could not reconcile opposing views of the sub-Saharan disease environment. His remarks suggest that the edenic vision of the natural world beyond the Senegal had begun to dissolve amid the accumulating experience of fever and the lingering shadow of death.

It was not until some two decades later, however, that a chronicler articulated a definitive rejection of the edenic vision. João de Barros was, like Zurara earlier, the Crown-appointed historian of his time. For about two years—between 1522 and 1525—Barros lived at the São Jorge da Mina castle. That experience in a region that he, like Pereira, termed “Ethiopia,” led Barros to suggest that “God . . . has placed [here] a striking angel with a flaming sword of deadly fevers, who prevents us from penetrating into the interior [and] to the springs of this garden.” And when he recounted the major events of the tenure of Portugal’s first governor at the fort, he noted that “there was not as much sickness in the land as had been feared.” Barros’s comments were not published until 1552 as a passage in his landmark chronicle Da Ásia. But the words had been penned no later than 1539. The change that had taken place in Portuguese perceptions

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33 I have borrowed the term “edenic” from Sérgio Buarue de Holanda, Visão do paraíso: Os motivos edenicos no descobrimento e colonização do Brasil, 2nd ed. (São Paulo: Companhia Editora Nacional, 1969).
34 Despite many claims, a careful reading does not make clear in what capacity Barros spent his time at São Jorge. For the most careful discussion of Barros’s activities as they relate to the castle see P. E. H. Hair, The Founding of the Castelo de São Jorge da Mina: An Analysis of the Sources (Madison: African Studies Program and the University of Wisconsin Press, 1994), 114-115. The stronghold would become infamous as ‘Elmina’ Castle, a major point of departure for African slaves on the Middle Passage.
37 Barros’s Da Ásia was published along with subsequent volumes by Diogo do Couto and Antonio Bocarro under the better-known title of Decadas da Ásia. The publication of these was intermittent and irregular. C[harles]. R. Boxer, Three Historians of Portuguese Asia: Barros, Couto and Bocarro (Macau: Imprensa Nacional, 1948), 7-8. Although the first volume of Da Ásia was published in 1552 and the second in 1553, the third volume was not printed until 1563 and the fourth only posthumously in 1613 or 1615.
of West African epidemiology was evident: the lull in sickness, not its occurrence, had become the noteworthy exception.

III

After the opening decades of the sixteenth century, European perceptions of the disease environment of West Africa would never again be the same. The repercussions of this for the practice of medicine in Portugal’s colonies were profound and far-reaching.\textsuperscript{38} They were not, however, immediate, and they took shape in response to particular interpretive challenges posed both by the peculiarities of particular diseases and by a tangle of European myth and miscomprehension surrounding the lands immediately below the Sahara. The gradual pace with which conventional wisdom was overturned was a consequence of objective factors—the coastal disease environment and the intermittent character of Portuguese activities there—as well as of discursive forces—the intellectual influences that were manifest in the concerns and expectations of the travelers themselves. For centuries after the beginnings of direct and sustained Portuguese-West

\textsuperscript{38} These opinions converged by way of a network of information gathering that reached from the Casa da Índia and the royal household to points throughout the empire. Still, even if the writings of Malfante, Cadamosto, Zurara, Pereira, and Barros make it possible to trace the process by which the peculiar epidemiological challenges of West Africa were recognized among European travelers, its precise timing is much more difficult to gage. Between 1400 and 1500 no fewer than an estimated seventy European ships visited the West African coast. The extant sources however cluster first around the decade of the 1450s and then in the years around the turn of the century. A precise voyage-by-voyage accounting of travelers’ impressions and the influence that their accumulated weight might have exercised on the minds of their immediate contemporaries would be highly speculative. The problem is magnified because although the dates of specific voyages along the West African coast are well known, publication of the impressions they left on those who could articulate them in print happened years or sometimes decades later—and that if at all. So it is not clear when—or even if—the opinions ventured in one account might have influenced other travelers. The degree to which knowledge generated by exploration circulated among a public attuned to issues of medicine and health remains, for now, a matter of conjecture. For the moment it is sufficient to note that, as the contradictory assessments of Pereira and the much more definitive conclusion of Barros make clear, a definitive shift in understanding did occur and it took final shape in the early 1500s.
African contacts, traders, slavers, missionaries and migrants would succumb to maladies of all kinds. Insect-borne pathogens like trypanosomiasis, malaria, and yellow fever, gastrointestinal afflictions such as dysentery, and a host of helminthic (parasitic worm) infections would be among the most common causes of sickness and death among newly-arrived merchants, settlers, and soldiers. This is a region so epidemiologically perilous that Kenneth Kiple has described it as “one of the most formidable disease environments in the world.”

Yet for the better part of a century travelers from western Christendom were convinced this was not so. Why? Part of the answer lay in the nature of the West African disease environment itself.

The most pervasive killers of European travelers were two: malaria and yellow fever. Malaria is a disease caused by protozoa that are transmitted from one human host to another by mosquitos of the genus *Anopheles*. Yellow fever is caused by a virus and, like malaria, is transmitted by mosquitoes, this time of the genus *Aedes*. Centuries of exposure had given local peoples along the West African coast a degree of immunity to both of these pathogens. For yellow fever this process is relatively straightforward: human hosts who survive the viral infection earn lifelong immunity. This usually happens during childhood so that the adults who met Cadamosto, Pereira, and others would therefore have exhibited little in the way of discernible symptoms. The case of falciparum malaria is more complex. Human communities living in regions where this strain is prevalent develop blood characteristics that limit malaria’s growth in the body. These include sickle-shaped red blood cells and numerous variations of a blood enzyme.

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39 Kiple, *Caribbean Slave*, 13, 20-22. For detailed information on the etiology, epidemiology, clinical manifestations and common prognosis for each of these and numerous other illnesses, see Kiple, ed., *The Cambridge World History of Human Disease*.

40 Kiple, Caribbean Slave, 14-17; Dunn, 855-862. To review: the four strains are Plasmodium vivax, Plasmodium malariae, Plasmodium ovale and Plasmodium falciparum.
deficiency, both of which occur in human communities that have had extended exposure to *P. falciparum* over several generations. These immunities meant that the presence of either of these diseases among local populations might have remained hidden to Iberian visitors.

The incubation periods for both diseases would also have prevented any immediate recognition of local epidemiology. Symptoms for malaria set in only ten to fifteen days after infection; the time required by the yellow fever pathogen is much shorter, between three and six days. In the late-fifteenth century, European visitors usually spent as little time ashore as possible. Indeed, Zurara’s chronicle is little more than an extended list of sporadic raids. The Portuguese and their other European accomplices would often have been back at sea, where shipboard illnesses were commonplace, before symptoms of illness acquired ashore were evident. Sicknesses contracted on land could therefore easily have been mistakenly diagnosed or overlooked. Unfortunately, shipboard maladies themselves rarely figured into the surviving fifteenth-century accounts so it is impossible to establish more precise connections between the coastal disease environment and that of the ships themselves.

Africa beyond the Senegal, however, was laden with special meaning long before Iberian shiphands ever hoisted sail in the Atlantic. Like the Spanish sailors who arrived to the Caribbean believing they had reached the islands of Asia, those Portuguese who

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42 Kiple, *Caribbean Slave*, 17-20; Donald B. Cooper and Kenneth F. Kiple, “Yellow Fever,” 1100-1107. Note that I have not yet located a source that provides sufficient information for more than a sketch of the development of yellow fever within the body (pathogenesis), thus the provisional nature of this discussion.
43 Dunn, 855-862; Cooper and Kiple, 1100-1107.
44 On Portuguese shipboard illness during the sixteenth and seventeenth centuries see Domingues and Guerreiro, *A vida a bordo*. 
sailed beyond the Senegal did so with a distinct set of expectations about the world they had entered. Their vision of the Africa that lay beyond the Senegal was one that combined popular lore with Ptolemaic geography and with a natural world drawn from the pages of Pliny’s *Natural History*. This was a place possessed of natural wonders and fanciful creatures—where life saving waters poured from a hidden spring and where the gentle currents of a mighty river gave life to a profusion of exotic plants and animals.

The vision of the globe that framed geographical knowledge in the middle and late fifteenth century was that depicted in Ptolemy’s *Geography*. And among fifteenth-century writers on the Atlantic, the world was assumed to be very much as Ptolemy, following Aristotle, had portrayed it: a giant sphere whose habitable northern and southern hemispheres (the antipodes) were divided by an immense, sun-scorched region (the torrid zone). The details of this geography—the precise number of terrestrial zones and whether or not the driest desert reaches were truly impassible, for example—were long a matter of debate among Scholastic philosophers. But according to Ptolemy, somewhere below the known trading networks of North Africa lay a vast if ill-defined region he referred to as “Ethiopia”—a land traversed by the extensive, meandering sinews of the Nile. When Pereira referred to the Senegal as a landmark on the fringes of “western Lower Ethiopia,” it was with clear reference to Ptolemaic geography. And it

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46 Pereira, bk. 1, ch. 27: 79-80.
was within the framework provided by Ptolemy that Barros identified the rivers and harbors near the São Jorge da Mina castle as “the entrances of this great Ethiopia.”

Ptolemaic geography combined with Pliny’s natural history and the legend of Prester John to lend the natural world associated with Ethiopia and the Nile a vital and even curative quality. All three pieces of writing fueled the Iberian imagination of the region beyond the Senegal. Pliny’s *Natural History* told in encyclopedic fashion what travelers should expect to find there. It catalogued all of the flora and fauna of the circum-Mediterranean world known to this first century Roman geographer. For the Nile, the *Natural History* told of the strange and even terrifying animals nurtured by its waters, and of the exotic trees and other plants found there that were not to be found anywhere else in the world. Pliny’s account of the natural world of the Nile accommodated in turn the most fanciful details of the famous Prester John legend. The realm of this mythical Christian potentate was believed to lie somewhere beyond the most easterly reaches of the Mediterranean. Early speculation had placed his kingdom in southern Asia but by the early-fourteenth century, Prester John was widely associated with the Nestorian Christians in the Coptic kingdom of Ethiopia. Regardless, the myth of Prester John retained a life of its own. The kingdom of this mythical potentate was believed to hold within it the fountain of youth and to contain the Biblical Garden of Eden—all located in a vaguely conceived “Ethiopia” and somewhere near the reaches of the Nile.

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47 Barros, bk. 2, ch. 8: 141.


Late-fifteenth century accounts of West African exploration were crafted with all of these associations in mind. The expansiveness of the Sahara Desert and what chroniclers judged as the poor physical state of the peoples there seemed to confirm that southward travel only led seafarers further into the barren lands of the torrid zone described by Ptolemy. Cadamosto’s description of the Sahara—that “the land is dry” and “sterile”—was as much a frank description of lands recently encountered as it was an affirmation of what was, to use Pereira’s phrase, “certain and known.” By contrast, the unexpected verdure of the African littoral beyond the Senegal suggested to fifteenth-century travelers that perhaps they were nearer to the Nile River than they had thought (figure 2.2). This conclusion was made possible not only by the highly inexact nature of maritime longitudinal navigation and the diminished distances of the Ptolemaic map, but also by longstanding European ignorance of African geography and the attendant speculation that the Senegal or one of West Africa’s other great waterways (the Niger River was another candidate) might link the western coast to the fabled Nile. Pereira’s title, Esmeraldo de situ orbis was an adaptation of De situ orbis, heavily referenced by Pliny and written by one of his contemporaries. Zurara and Pereira both, citing Pliny, readily elaborated on the fantastical flora and fauna they fully expected the Portuguese to find further up the Senegal as a result of the influence of the rich and transformative waters


50 Cà da Mosto, 16, 26.
51 Pereira, bk. 1, ch. 37: 80.
52 Philips, 28-31; Dwyer, 8-9; Parry, 55.
53 The writer was Pomponius Mela, Pliny’s senior by several years. See Dias’s “Introdução” in Pereira, Esmeraldo, 4.
of the Nile. This was symptomatic of the pervasive confusion within Europe over West African hydrography, which played itself out in cartographic fits: streams flowed and pooled ambiguously across numerous late medieval maps, as cartographers themselves grappled with contradictory reports from texts and travelers (figure 2.3). The same was the case with the globe produced by Martin Behaim. The well-known Bohemian cosmographer crafted it around 1492, while he was in the employ of Afonso V, and based

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it partly on his interview with the aged and ailing Diogo Gomes—the Portuguese pilot who accompanied Cadamosto up the Gambia River.55

West Africa was therefore already saturated with medical significance. The sun-scorched Sahara was perilous and allowed only the most meager of human existence. The verdure of the natural world beyond the Senegal, by contrast, seemed to indicate its confluence with the Nile and a connection with that mysterious river’s exotic, profuse, and potentially curative flora. Assumptions like these shaped the expectations and early assessments of fifteenth-century seafarers. Although such opinions were widely taken as authoritative, the lived experience of disease—and fevers in particular—contradicted them.

Classical and Scholastic learning patterned early modern encounters.56 As J.H. Elliot pointed out long ago with reference to the Americas, the novelty of the overseas world was not immediately evident to late-fifteenth and sixteenth-century contemporaries, though first-hand experiences of that world provided undeniable evidence that the truth claims of classical and medieval authorities were only partially credible.57 The European encounter—not only with the Americas but with the mythical overseas world more generally—represented a profound challenge to prevailing interpretations of human and natural history. This engendered a lasting process of revisionism as chroniclers and other travelers sought to situate new realities within the


Figure 2.3. Anonymous Genoese Map from 1490. A west-reaching branch of the Nile stretches in three pools almost but not quite far enough to link it to three adjacent pools of the Senegal—enough to suggest, though not commit to, the proposition that the Nile did indeed flow to the West African coast. Jay Levenson, ed., with an introduction by Daniel J. Boorstin, Circa 1492: Art in the Age of Exploration (New Haven: Yale, 1991): 145-146. The depiction of a possible Nile-Senegal connection is almost identical to that on the portolan chart of Palestrina (ca. 1503) in Stevenson, Marine World Chart, plate facing p. 59.

framework of inherited knowledge. The overseas encounter with the unanticipated disease environment of the West African littoral prompted a similar process of

58 Besides the texts discussed in Pagden’s Fall of Natural Man, a superb example is that of the Spanish Jesuit José de Acosta, in Jane E. Mangan, ed., The Natural and Moral History of the Indies, translated by Frances López -Morillas with an introduction and commentary by Walter Mignolo (Durham: Duke, 2002).
adjustment—one that would establish a set of research questions and extend a set of conventional investigative techniques into the Atlantic and Indian Ocean theatres.

IV

The proposition that illness could derive from exposure to verdant, fecund environments was a troubling portent for Pereira, Barros, and their successors—imperial administrators and overseas settlers alike. It was one thing to reconcile authoritative opinion with lived experience along a fabled stretch of the African coast that lay immediately beyond the Senegal River. But the implication that any apparently bountiful place might nevertheless be lethal to foreign visitors was one that reached far beyond the West African coast. It encompassed the Atlantic and Indian Ocean basins and, indeed, anywhere the Portuguese might venture. It was so wide reaching not because it challenged classical accounts of African geography but because it tugged at a fundamental set of associations that made the observable natural world make sense. This was the humoral framework itself. Humoral theory provided a single and comprehensive method for making sense of a discreet range of observable natural phenomena—from the presence and apparent health of people, plants, and animals, to differences in their development, and the causes of disease and death. In effect, the natural world became a set of mutually reinforcing signs: unhealthy places were barren but healthy ones were lush and life there was abundant.\(^{59}\) Humoral theory disciplined the interpretive practices of fifteenth and sixteenth-century seafarers by determining for them what aspects of a

place were most indicative of its health and, for those who were versed in medical theory, it provided causal explanations for why this should be so.  

Of course, at its core, humoral pathology held that human health depended on a proper balance of the four humors believed to circulate within the body—blood, phlegm, and black and yellow bile. Sickness was an indication that their delicate equilibrium had been upset, either through the corruption of one or more humors, through humoral excess or deficiency, or because of damage to one of the internal organs that synthesized and regulated them. What is important for interpreting the medical aspect of the early Portuguese chronicles is that humoral pathology conceived of the body as existing within an intricate web of relationships linking it both to the immediate environment and the cosmos. Possible influences were wide ranging. The so-called six things non-natural, shifts in the weather, the climatic variations that came with changing seasons, the perceived movement of the stars, the lunar cycle, and events such as the passage of comets or eclipses were all laden with medical meaning. The individual body was thus a microcosm within which natural forces—both earthly and extraterrestrial—interacted, preserving health or provoking illness.

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60 Here I am making a claim for humoral pathology similar to that made by Byron J. Good for modern biomedicine: that it is “a set of distinctive interpretive practices” that comprise “a mode of apprehending and acting on the world.” See Good, “How Medicine Constructs Its Objects,” Medicine, Rationality, and Experience: An Anthropological Perspective (New York: Cambridge, 1994), 65-87.

61 Of the “six things non-natural” there was little in the way of a consistent, widely accepted definition. See Peter H. Niebyl, “The Non-Naturals,” Bulletin of the History of Medicine 45 (1971): 486-492; and Goodyear, 80-81. On temperament and physiology there was also little in the way of a single, overarching, internally consistent and widely embraced conceptualization that was current in medieval Europe. The single best discussion of this is probably that in Oswei Temkin, Galenism: Rise and Decline of a Medical Philosophy (Ithaca: Cornell University Press, 1973), especially 13, 18-19, 55, 73, and 154-156. Goodyear, 78-81, provides a schematic overview.

62 Among members of the royal household, the coincidence in July of 1415 of a long eclipse of the sun and an outbreak of pestilence in Lisbon were thought to be related. They led to the...
Pathology was only one aspect of humoral theory. That theory itself was considerably more comprehensive and had much broader applicability. Because everything from the four bodily humors, to the organs that regulated and synthesized them, to the plants and animals of the natural world were all believed to be composed of the same basic elements, they were also understood to be liable to the same environmental influences. The view that both the human and natural worlds were subject to the same forces, both life-giving and debilitating was one with deep and

dead of Queen Phillipa and were sufficient to stall Portugal’s attack on Ceuta, its original imperial venture. Russell, *Prince Henry*, 44-46.

63 This was true for all material objects between the earth and the moon. Beyond the moon, material objects were composed of a fifth element, ether. None of these, however, were understood in modern terms as elements that are primary and irreducible. See the discussion in G. E. R. Lloyd, *Early Greek Science: Thales to Aristotle* (New York: Norton, 1974), 36-49. As it pertained to medicine, humoral composition was worked out most influentially in writings associated with Hippocrates of Cos (ca. 450-370 BCE) and by Galen of Pergamum (ca. 129-216 CE). To resolve a persistent controversy over the precise number of bodily humors, Galen relied on a treatise titled *The Nature of Man*, which he believed Hippocrates himself had originally written. In it the author had argued that the essential bodily humors numbered four in all. These were blood, phlegm, and black and yellow bile; black bile was not, as some Hippocratics had later claimed, a corrupted form of yellow bile. The single best work on Galen is probably Temkin, *Galenic*. See also the “Introduction” to G. E. R. Lloyd, ed., *Hippocratic Writings* (New York: Penguin, 1983). Subsequent authors concerned with botany and natural history sought to specify how the four elements might comprise everything from bugs to trees. And they too, explained growth and development in terms of environmental factors such as climate, water, soil, and airs. On plants see for example the discussion of Theophrastus, *Enquiry into Plants and Minor Works on Odours and Weather Signs*, 2 vols., translated by Sir Arthur Hort (London: William Heinemann, 1916); Theophrastus of Eresus studied under Aristotle and was his successor at the famous Academy. On animals, I particularly like Pliny’s discussion of the anatomy, physiology and pathology of bees in *The Natural History of Pliny*, 3 vols., edited by John Bostock and H. T. Riley (London: Henry G. Bohn, 1855), v. 3, bk. 11, chps. 2-4 and chps. 19-21. On environmental influences see Glacken, 429-460; Nutton 158-159; Roger French, “Astrology in Medical Practice,” in Luis Garcia-Ballester, Roger French, Jon Arrizabalaga and Andrew Cunningham, eds., *Practical Medicine from Salerno to the Black Death* (New York: Cambridge, 1994), 30-59; and the essays in William R. Newman and Anthony Grafton, eds., *Secrets of Nature: Astrology and Alchemy in Early Modern Europe* (Cambridge: MIT Press, 2001); and finally Luis Garcia-Ballester, Jon Arrizabalaga, Montserrat Cabré, Lluis Cifuentes and Fernando Salmón, eds., *Galen and Galenism: Theory and Medical Practice from Antiquity to the European Renaissance* (London: Ashgate, 2002).
prestigious roots in the intellectual history of the Latin West.\textsuperscript{64} It was given what was perhaps its clearest expression in the Hippocratic treatise, \textit{Airs, Waters, Places}.
\textsuperscript{65} This text received a great deal of attention among Scholastics because it concisely and systematically worked out a set of climatic explanations for the diversity of social, political, and cultural life found among human communities across Eurasia. It served, in other words, as a handbook that explained observable human and environmental difference in terms of observable, natural causes.\textsuperscript{66} On the eve of Portugal’s Atlantic voyages, this was the epistemological framework that guided early modern explanations for the causes of disease. From a humoral perspective, the way to gage whether a place was healthy or not was to examine the airs that circulated there and the quality of its soil and water. Where these were good, the flora and fauna would be abundant and the people healthy. Although the unknown author of \textit{Airs, Waters, Places} insisted on an order of interpretation—air, then water, and then the vitality of local plants, animals, and humans—fifteenth and sixteenth-century chroniclers like Cadamosto, Zurara, Pereira, and Barros, as well as the apothecaries and university-trained physicians who followed them overseas, did not.

The region beyond the Senegal River provoked so much commentary from fifteenth-century travelers because it was simply much more enigmatic than the Sahara to its north. From the perspective of humoral theory, the Sahara was an entirely comprehensible region and humoral pathology predicted precisely what Europeans found to be true there: in the over heated environment, death from fever was, predictably, a

\textsuperscript{64} I develop this below with reference to humoral theory but on environmental influences broadly speaking see Glacken, 254-286.
\textsuperscript{65} Lloyd, ed., \textit{Hippocratic Writings}, 148-165.
\textsuperscript{66} Glacken, 80-115, 150-170 and 188-354.
common occurrence. Hence Cadamosto offered what was for him the entirely unproblematic comment that the Arab and Azanaghi residents “sicken in this place [north of the Senegal] and die . . . on account of the great heat,” offering the summary explanation that “at certain seasons of the year,” the extreme heat “causes the blood to putrefy.” \(^{67}\) Similarly, Zurara summed up in a few lines what he took to be common knowledge among mariners in the 1450s: in the Sahara past Cape Bojador “there are neither people nor settlements whatsoever and the land is no less arid than the deserts of Libya, where there is neither water, nor trees, nor anything green.” \(^{68}\)

Beyond the Senegal too, especially amid the exuberant nature on the northern fringe of the continent’s immense equatorial forests, the all-encompassing tautology of the humoral framework seemed at first to hold true: the immoderate climate yielded immoderate qualities in all the plants, animals, and humans who lived there. As Cadamosto remarked, “all men are . . . tall and big, their bodies well formed; and the whole country [is] green, full of trees, and fertile.” \(^{69}\) Even Zurara, who was usually far more concerned with detailing Portuguese exploits than puzzling through the novelty of either human societies or the natural world, could not stop himself from marveling at the abundance of the Senegal. In a simile that was aptly bellicose for this chronicler of conquests, Zurara reported that the shells of the sea tortoises that swam along the coast were “as big as a battle shield.” \(^{70}\) Pereira emphasized how the fecundity of the environment not only allowed animals such as elephants to grow to enormous proportions

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\(^{67}\) Cà da Mosto, 21. I have added the italics for emphasis.  
\(^{68}\) Zurara, ch. 8: 51.  
\(^{69}\) Cà da Mosto, 27.  
\(^{70}\) Zurara, ch. 44: 209-210, ch. 59: 274-275. It should be noted that Zurara never traveled abroad but instead got much of his information from João Fernandez, was Portuguese who traveled overland throughout the Sahara for seven months in 1445 and visited the many of the main markets there. See Zurara, ch. 77: 364-370.
but also allowed them to reproduce so profusely as to form vast herds. The same was true, he noted, for the numerous, large, and beautiful birds. In similar fashion, Barros drew attention to the fresh water borne to the coast by the Senegal and Gambia Rivers, to which he attributed the evident abundance of life: “the animals which drink the waters of these rivers are so numerous and of so many varieties that even elephants go in herds.”

Abundance and immoderation were not always manifested as strength and beauty. They could be negative qualities as well. Thus Pereira reported on the strange and threatening creatures found beyond the Senegal too. He was especially impressed by the snakes that were “very big” and “very wide,” among which were some that measured “a quarter of a league” in length; they had large eyes and a mouth and fangs “corresponding to their size.” They inhabited the lakes and coastal waters but were known to “leave great destruction in their wake” (por honde leuam seu caminho muito dano fazem) when they slithered out of water, which was “in their nature” to do—though he admitted that they rarely appeared and that such things would be difficult to believe among those who lacked the “experience of such things” (a pratica d’estas cousas). That phrase, “in their nature,” was repeated time and again by travelers explaining why things were so, anchoring explanations to the pervasive influence that environmental factors had on the constituent humors of people, plants, and animals.

Here was a land that appeared to possess all of the qualities suggested by Pliny and popularly enshrined in the legend of Prester John, a place whose location fit easily within the geography of Ptolemy—and one, moreover, whose qualities were cogently

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71 Pereira, bk. 2, ch. 5: 114-115.
73 Pereira, bk. 1, ch. 27: 82.
74 On this tautology see Dear, 15-24.
explained by humoral theory. That theory comprised the basic interpretive framework that allowed European travelers to make sense of unfamiliar, dense, and thickly layered ecologies. Hence Barros could move easily from a description of the millet fields, mangroves, and elephants of the region between the Senegal and the Gambia rives to construct a comprehensive classification of all of the lands that lay along the vast southern fringes of the Sahara—one based on water and soil, and the plant and animal life they yielded.75 As with the Sahara, so too beyond the Senegal: the apparently exceptional quality of the local environment fostered what at first seemed to be a pervasive vitality in the resident plant, animal, and human populations. The Sahara was characterized by an arid and debilitating climate, an appropriately barren landscape, and enfeebled inhabitants. But beyond the Senegal, a warm climate and fertile land continually replenished by good water nurtured a landscape as beautiful as it was bountiful. The Sahara was a land of fevers; beyond the Senegal was a land of vitality and abundance. Pervasive illness beyond the Senegal not only flew in the face of ancient and authoritative accounts, it challenged the very framework that seemed to explain the internal operations of the natural world itself.

V

Both the diagnostic categories (fevers) and explanatory constructs (the association between particular environments and health or disease) of humoral pathology had been fundamentally challenged by the epidemiological landscape of coastal West Africa. Among the consequences of fifteenth century exploration in the Atlantic were an abiding skepticism about the validity of humoral associations, the stirrings of a research question

about the treatment of fevers—especially tertian fevers, an increased attentiveness to unfamiliar local medicines, and a growing sense that exploration and colonization demanded closer administrative attention to matters of health.

In the face of widespread sickness and death, and as it became evident that experience below the Senegal did not meet expectations, European travelers began to venture their own tentative suggestions as to the causes of high mortality. Cadamosto’s refusal to eat the suspiciously small dates of the Gambia was one instance. Sickness according to the Venetian merchant may have perhaps derived in some way from the diminutive fruits of the region. His fellow traveler Diogo Gomes offered the conventional explanation for fevers by citing heat as the primary culprit. He also related what the locals in the Gambia River entrepot of Cantor had told him: that many people further south “did not live long on account of the impure air” of the gold mines there. For Gomes, an explanation linked to air seemed eminently plausible. He repeated it without comment. Barros wondered if perhaps some of the Senegal’s life-giving water was the cause. In reference to the Senegal and one of its upriver tributaries, the Gufitembó, he explained that “when anyone drinks water from one [river] and then the other, he begins to vomit.” Such illness was due to the fact that the two rivers were different in their very nature—“competitors and contrary”—as indicated by their contrasting colors, the Senegal white and the Gufitembó red. But, as though puzzled and perhaps unconvinced by his own explanation, Barros added that “neither of [the rivers], separately, cause this . . .

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Gomes was a nobleman, pilot, and member of the royal household who was dispatched to the Senegambia region in the early 1480s to secure trading agreements for the Portuguese. His testimony was taken first in German but was subsequently translated into the Latin and, only in the nineteenth century, was copied into both Portuguese and English. For reasons of access, I have relied on Crone’s description and publication of the English version in Voyages of Cadamosto and Other Documents, xlv, 95.
do they do so] even after they have run together.” With their emphasis on coastal vegetation, air and water, these explanations were clearly forged within a humoral framework. Whatever the cause of the fevers, it clearly appeared to have something to do with the coastal environment itself—even if no one could yet be sure what precisely it was. But no matter how healthy the lands might appear—no matter how evidently salubrious the warm air, fresh water, and lush vegetation—the conventional signs of health could not be trusted.

Early Atlantic endeavors opened the question. And from the close of the fifteenth-century forward, the Portuguese entered unfamiliar tropical environments with an abiding uncertainty over each region’s health and the viability of Portuguese settlement there. It was this concern that prompted Caminha to emphasize the apparent health of coastal Brazil in 1500. And it was the same preoccupation that led Nóbrega to venture his own optimistic appraisal of Brazil immediately upon arrival in 1549. But after his Jesuit colleagues Grã and Lourenço attended the mass and funeral for Diogo Jacome, they would surely have rejected that verdict. An abiding concern with the health of a place and its survivability also compelled numerous sixteenth-century Portuguese chroniclers—from Duarte Barbosa in India to Gabriel Soares de Souza in Brazil—to detail the apparent quality of the air, water, flora, and fauna, and to inventory locally available produce as they sailed between ports in southern Africa, South America, and East Asia. With

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77 Barros, “Decada Primeira,” bk. 3, ch. 8: 215. In his translation of this section of Barros’s text, Crone, 137 n. 1, explains that the river is probably the modern Feleme and that the red color was due to the laterite from which the gold was mined.

78 Duarte Barbosa, O Livro de Duarte Barbosa (edição crítica e anotada), Volume I: Introdução, texto crítico, e apêndice, Maria Augusta da Veiga e Sousa, ed. (Lisbon: Ministério da Ciência e da Tecnologia, Instituto de Investigaçao Cientifica Tropical, e o Centro de Estudos de História e Cartografia Antiga, 1996); and Gaspar Correia, Lendas da Índia, revised and with an introduction by M. Lopes de Almeida (Porto: Lello e Irmão, 1975). On Brazil and India
epidemiological uncertainty came the indispensability of such assessments, however tenuous they may have been.

If nature and disease proved enigmatic, Atlantic travelers wasted little time in inquiring how the people they met managed to survive. Cadamosto took care to note that the peoples of the “empire of Mali” drank one large ampule of saline solution daily in order to avoid the ill effects of the scorching temperatures. 79 When Pereira discussed how “the Portuguese . . . suffered many illnesses in Guinea,” he gave details on the medicinal substances in use among the Jolof and Mandinga near the mouth of the Senegal. One was a stone called alaquequas that could stop the flow of blood. The other a white and hard-crusted bread that was “dark as a buffalo’s horn within . . . and hard as a bone.” It was called balamban and was “made into a powder, mixed with water . . . [and given] to drink to those with cough.” 80 The description and adoption of local healing techniques dated to the very earliest moments of Atlantic exploration. Empiricism and the acceptance of the legitimacy of anecdotal evidence in science and medicine appear not have been the innovative products of later, distinctly colonial settings, as recent studies on the Portuguese, Spanish, and Dutch colonies in Asia and the Americas seem to argue. Rather, these represented the extension into the Atlantic of what were already conventional ways respectively, Laura de Mello e Souza and Ines Zupanov have addressed the ways that humoral associations influenced popular religion and the Jesuit missionary enterprise. Souza, O diabo, especially chapter 1; and Ines G. Županov, Missionary Tropics: The Catholic Frontier in India (16th-17th Centuries) (Ann Arbor: University of Michigan, 2005). See also Holanda, Visão do paraíso; and Ronaldo Vainfas, Trópico dos pecados: Moral, sexualidade e inquisição no Brasil (São Paulo: Editora Campus, 1989).

79 Cà da Mosto, 21-22. Salt for the concoction came from Mali’s extensive salt mines, which supplied the trans-Sahara commerce including the famous—if also apocryphal—silent trade. See Philip D. Curtin, Cross-Cultural Trade in World History (New York: Cambridge, 1984), 12-13.

80 Pereira, bk. 1, ch. 27: 82.
of making natural knowledge. The intensification of medical borrowings in the colonies was a response to the need to survive in a tropical world that was—at least by the end of the fifteenth century—widely held to provoke numerous and deadly fevers. As important, however, the adoption of unfamiliar remedies through contact with local healers did not mean that medical practitioners hailing from western Christendom readily accepted local explanations for why the unfamiliar medicines worked. In Portugal and its earliest colonies, an explanatory conservatism prevailed. Medicines were adopted to be sure. But it was in the production of causal explanations that experience—through the mechanism of deductive reasoning—yielded to the authority of intellectual tradition. I will return to this theme several times in the course of the following chapters.

The constancy of illnesses meant that Portuguese physicians were uniformly compelled to grapple with a series of questions about why epidemic diseases broke out and how best to handle them. They were also driven to solve the intractable problem of tertian fevers. Indeed, finding effective febrifuges was a central preoccupation and it underwrote both of the only published medical treatises known to have come out of Portugal’s empire in the sixteenth-century. Garcia de Orta and Aleixo de Abreu were not part of a single, coherent intellectual community. They operated at opposite ends of the known world. And much about their lives and work were markedly different. Garcia de Orta left Lisbon for

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82 The case had been made for English anatomical investigation using the example of William Harvey in Temkin, *Galensim*, 158-159. See also Ian Maclean, “White Crows, Graying Hair, and Eyelashes: Problems for Natural Historians and the Reception of Aristotelian Logic from Pomponazzi to Bacon,” in Gianna Pomata and Nancy G. Siraisi, eds., *Historia: Empiricism and Erudition in Early Modern Europe* (Cambridge: Massachusetts Institute of Technology Press, 2005), 147-180.
Goa in 1534. Aleixo de Abreu was dispatched to Luanda in 1591 before later crossing the
Atlantic to Bahia. Orta had been a lecturer in natural philosophy in what would later
become the prestigious University of Coimbra. It was an appointment he had only
recently gotten and it took a convergence of factors to pry him away from it. The impetus
to leave derived in all likelihood from the growing support for the Holy Office of the
Inquisition both among Lisbon’s clergy and certain factions at the court of João III. A
New Christian with links to the royal household, Orta represented to some ministers the
most visible aspect of a pernicious heretical faith. He was for that reason particularly
vulnerable to intrigues. The opportunity to leave for India came with the return of
Martim Afonso de Souza from Brazil. Besides ridding the South American littoral of
French interlopers, Souza championed the development of some of Brazil’s earliest sugar
plantations. He had proven himself a valued servant of Crown interests and João III
now dispatched him to Asia, where as captain-general (capitão-mor do mar), Sousa was
to secure Portugal’s Estado da Índia. The nobleman chose the New Christian as his
personal physician. As it turned out, the two shared an appreciation for the value of
naturalia. Aleixo de Abreu came from an established Old Christian family and graduated
from the universities of Évora and then Coimbra in the 1580s. By 1591, he held a newly
minted degree at a time when both Portugal and its empire were strapped for physicians.
And yet after a short time in Lisbon, Abreu had managed to run afoul of his royal
benefactors and risked losing his medical license. He accepted a post in Luanda—then

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83 On antipathy toward New Christians see, Daviken Studnicki-Gizbert, A Nation Upon the
Open Sea: Portugal’s Atlantic Diaspora and the Crisis of the Spanish Empire, 1492-1640 (New
York: Oxford, 2007), 21-25; Sanjay Subrahmanyam, The Portuguese Empire in Asia, 1500-1700
(New York: Longman, 1993), 80-96 and 56-73, discusses the imperial ramifications of court
factionalism.
84 Stuart B. Schwartz, Sugar Plantations in the Formation of Brazilian Society: Bahia, 1550-
the least desirable outpost in all of Portugal’s empire—as a last ditch effort to salvage his endangered medical career. The assignment nearly killed him. Thirteen years later and with his reputation on the mend, Abreu was chosen by Diogo Botelho to serve as his personal physician during Botelho’s tenure as governor of Brazil.

For both Orta and Abreu, the initial concern with tertian fever was overwhelmed by larger considerations. Orta found himself in the heart of Portugal’s Asian trade empire. Abreu’s sojourn encompassed two of the most important way stations in the intensifying trans-Atlantic slave trade. Far more than in the Estado da Índia, Portugal’s Atlantic economy was built on settlement and slavery. Manual labor power and the bodily health that sustained it were concerns in the Atlantic in ways that they were not in Portuguese Asia. Whereas Orta grew preoccupied with identifying commoditized nature, Abreu was concerned with sustaining commoditized bodies. Hence Orta’s examinations of tertian fever appeared in print as part of a sprawling compendium on the spices and medicinal plants of South Asia, his Colôquios dos simples e drogas da Índia (Goa, 1563). Abreu’s work, much more focused on diseases and their bodily manifestations, appeared as the Tratado de las siete enfermedades (Lisbon, 1623)—a Treaty on the seven infirmities, one of which was tertian fever. Everywhere, when medicine was concerned, Portuguese specialists tended to approach cross-cultural interaction—from South Asia to

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85 Published in Goa: Johann de Endem, 1567. The complete and original title in Portuguese is Coloquios dos simples, e drogas e cousas medicinais da India, e assi dalgus frutas achadas nella onde se tratam algus cousas tocantes amediçina, pratica, e outras cousas boas, pera saber çopostos pelo Doutor garcia dorta: fisico del Rey nosso senhor, vistos pelo muyo Reverendo senhor, ho licenciado Alexos díaz: falcam desenbargador da casa da supricacçã inquisidor nestas partes. I have omitted the second part of this title not only for the sake of brevity but because I will return to it and the context it evinces in the following chapter.

86 Published in Lisbon, 1623. The full title in Spanish is Tratado de las siete enfermedades, de la inflamacion universal del higado, zirbo, pyloron, y rinones, y de la obstrucion de la satyriasis, de la terciana y febre maligna, y passion hypocondriaca. Lleva otros tres tratados del mal de Luanda, del gusano, y de las fuentes y sedales.
the South Atlantic—as a vehicle for identifying, describing, and defining the properties of precisely those medicines believed to be most effective against debilitating and often deadly fevers. Favored treatments would range from the prized bezoar stones of southern India to Amerindian ipecac (ipecacuanha) and a secret recipe for theriac devised by Jesuits in Brazil.  

By the time Orta and then Abreu made their way overseas, the management of health in the service of exploration and nascent colonization had become a focal point of imperial policy. When Orta sailed down the Tagus and out into the Atlantic, João de Barros had been back from São Jorge da Mina for almost a decade. From at least as early as the construction of that portentous redoubt had reports of widespread illness, like those of commercial promise, begun to change hands among the ministers of the Portuguese Crown. By the opening of the sixteenth century, missives of ink and parchment were accumulating in the carefully guarded chambers of the Casa da Índia, the ministry charged with coordinating the affairs of state across an expanding theatre of activity. For a time, Barros himself was the keeper of the archive. Periodic reports of illness and pleas for assistance arrived from Crown-appointed factors and other colonial officials in Africa, Asia, and the Americas. Almost uniformly, they requested measures to save the king’s soldiers and settlers, and the women and children who—on rare occasions—had accompanied them overseas. Imperial expansion and overseas settlement required an infrastructure that could keep accounts and correspondence, and manage health as well.

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I discuss these at length later but for a useful overview see Maximiano Lemos, *Farmacopeia Portuguesa dos séculos XVI à XVIII*, separata of *A medicina moderna* (Porto: Tipografia da Empreśa Guedes, 1922), 11-21. Neither bezoar stones nor theriac were of course new; rather it was their novel ingredients and origins that underwrote their enhanced capacities. Gilbert Watson, *Theriac and Mithridatum: A Study in Therapeutics* (London: The Wellcome Historical Medical Library, 1966).
On paper if not in practice—and sometimes more grudgingly than others—the Crown and his ministers provisioned the most important outposts with some combination of a makeshift hospital, a physician, an apothecary, and a surgeon. Slowly and even haltingly an imperial medical infrastructure came into being. Sometimes, as at Sofala, approval and funding from the royal account came decades after conditions on the ground required it; royal approval in these cases was little more than formalized acquiescence—the accommodation of arrangements already in place. Sometimes a vital facility would fall into disrepair despite the protestations of royal factors assigned there. This happened at Mozambique Island. And on occasion, even when no unusual need seemed to merit it, a thriving health care practice would emerge because local circumstances made it possible—such as happened at Cananor on the Malabar Coast, where diplomatic relations and easy access to abundant local produce made it a favored spot for convalescence.

The whole system traced its roots to two small towns—Faro and Tavira—on the southernmost shores of Portugal itself, and to a time when North Africa and the Canary

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88 See the varied arrangements made for Mozambique, Sofala, Aden, Hormuz, Diu, Bassein, Cananor, and Malaca in Panduronga S.S. Pissurllencar, ed., Regimentos das fortalezas da Índia (Goa: Tipografia Rangel, 1951).
89 As was the case with Sofala—see Pissurllencar, 196-197; and follow the correspondence in Documentos sobre os Portugueses em Moçambique e na África Central, 1497-1840, vol. V (1517-1518), (Lisbon: National Archives of Rhodesia and the Centro de Estudos Históricos Ultramarinos, 1966), 528, 530-531, 556-558, and 561.
90 The hospital at Mozambique Island was the subject of much wrangling between the Crown and appointees on the island. See Documentos sobre os Portugueses em Moçambique e na África Central, 1497-1840, vol. VII (1540-1560), (Lisbon: National Archives of Rhodesia and the Centro de Estudos Históricos Ultramarinos, 1966), 196-211.
Islands marked the extent of Portugal’s Atlantic reach. In 1415, Faro’s alcalde mor donated a small house to a group of Trinitarian friars, who began shortly thereafter to care for injured returnees from Portugal’s Ceuta campaign. Faro’s hospital later began to treat ill seamen returning from the Guinea Coast. It functioned for the next thirty-five years until 1450, when a recurrence of plague decimated southern Portugal. Neighboring Tavira managed to survive. In 1425 its Hospital do Espírito Santo had begun caring for ill returnees from the Atlantic too. And at mid-century, it replaced Faro. Over the late-fifteenth century, these missionary-run hospitals found their way into the Atlantic, at Portuguese Saharan entrepôts like Arguim and Arzila, and then to São Tomé and the Cape Verde Islands. Missionary staffers were joined by the occasional surgeon or apothecary and hospitals were run with royal subsidies—especially in the form of pay for the apothecary, whose expert knowledge of flora, medicinal or otherwise, made them valuable commercial go-betweens and thus a royal asset twice over.

It was the convergence of medicine, commerce, and missionary zeal that enabled the network to funnel information on disease, medicine, and mortality into the ministerial chambers of the Casa da Índia. To be sure, it was probably always only a fraction of the official correspondence generated even at the dawn of Atlantic expansion. But the paper traffic this generated was heavy enough that it appears to have stressed the epistolary resources of the state already in the closing decades of the fifteenth century: physicians

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93 Arquivo Nacional Torre do Tombo, Corpo Chronológico (henceforth ANTT, CC), Parte II, mç. 60, n. 91; Parte II, mç. 61, n. 53; Parte II, mç. 98, n. 26; Parte II, mç. 98, n. 32; Parte II, mç. 113, n. 82; Parte II, mç. 113, n. 112.
and apothecaries in this diminutive Atlantic empire regularly complained of the need for more paper and ink. These exchanges set in place a pattern that would be replicated with settlement in the Indian Ocean and Atlantic basins. Direct access to sub-Saharan trade made costly medicines such as tamarind and spikenard more readily available to metropolitan physicians. And with institutions designed to manage the health of an empire came a loosely-knit network that could channel selected *materia medica* anywhere in the Portuguese world. Lisbon quickly became the West’s premier market for prized Indian bezoars. As will become clear, colonial correspondence grew increasingly concerned not only with known medicinal plants employed in familiar ways but with unfamiliar ones used in borrowed recipes and in the context of suspicious medical rituals by non-Christian, non-Portuguese medical specialists. Concerns over these methods were voiced with growing alarm in colonial senate chambers in India and the Atlantic. What *materia medica* were used, who used them and how became major points of contention and underwrote decisions over the investigation of unfamiliar medicines, as well as whether or not they entered into imperial circulation.

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95 This movement between outposts and the Casa da Índia, as well as requests for supplies and payment, can be traced through several exchanges: ANTT, CC, Parte I, mç. 38, n. 3; Parte I, mç. 50, n. 14; Parte II, mç. 16, n. 97; Parte II, mç. 17, n. 81; Parte II, mç. 18, n. 85; Parte II, mç. 18, n. 101; Parte II, mç. 60, n. 89.

96 Jaime Walter, “O Infante D. Henrique e a medicina,” *Studia* 13/14 (1964): 31-39. As we will see, tamarind and spikenard both earned the attention of Garcia da Orta in India. The development of metropolitan medicine is of course a story that runs parallel to all of this. For the founding of the University of Coimbra medical faculty see Iona McCleery, “Opportunities for Teaching and Studying Medicine in Portugal before the Founding of the University of Lisbon (1290),” *Dynamis* 20 (2000): 305-329. On Portuguese medicine, see Maximiano Lemos, *Archivos de Historia da Medicina Portuguesa*, 2 vols., (Lisbon, 1887-1888); and Augusto da Silva Carvalho, *Crónica do Hospital de Todos-os-Santos* (Lisbon: N.p., 1949); and, in English, Goodyear, 74-78, 118-119. For the larger European context, see Cobnrad, Nutton, Neve, Porter, and Wear, *The Western Medical Tradition*.

97 Lemos, *Farmacopoeia*, 16.

98 What constituted “Portuguese” as it applied to colonial intellectual life was variable, responsive to local variables, and it addressed in detail the following chapters that focus on Goa and Bahia.
All of these exchanges, like the earlier observations of Cadamosto, Gomes, Pereira, and Barros were undertaken with the collaboration of informants from areas of Portuguese settlement. Orta’s *Colóquios* and Abreu’s *Tratado* were both the outcome of medical investigations that began with concerns over the legibility of nature in unfamiliar places and with the treatment of tertian fever. But the study of nature was intertwined—indeed inextricably entangled—with deeper concerns over the ordering of colonial society. In India and the Atlantic, the cross-cultural medical borrowings and collaborations of the Portuguese world came to represent a threat to an idealized colonial order. Such interactions relegated to non-Europeans a measure of authority over the collective health of the colony; it also, implicitly, threatened to legitimate alternate methods of medical fact-making and alternative explanations for the inner-workings of the natural world. Reliance on local medical specialists thus inverted—and therefore threatened to undermine—the social, economic, political and cultural relations intended by policy-makers in Lisbon and desired by powerful factions of Portuguese viceroys, governors, magistrates, missionaries and settlers in Goa and Bahia. To examine why in India or Brazil the Portuguese adopted local medicines and to assess precisely what early modern colonization meant for medical knowledge-making is to be sensitive to the tensions that impinged upon the daily activities of survival in colonies far beyond the Senegal. The following chapters examine in detail the making of medical knowledge on the sixteenth-century colonial stage. The medical exchanges that took place first in Goa and later in Bahia unfolded in ethnically diverse, polyglot colonial settings—and with all of the epidemiological uncertainty proffered by the West African encounter.
In Pursuit of a Legible Empire
Disease, Commerce, and Generations
of Natural History

Only time uncovers the truth of things.

—Letter of Tomé Pires to Dom Manuel I (Cochin, 27 January 1516)¹

I do not doubt that if someone who had a good knowledge of the matter of simples, with good principles of philosophy and medicine, came here, he would greatly advance medicine. And an artist who knew well how to draw and paint plants might offer such delight with their representation; because the great degree of originality in this area is unimaginable[.]

—Letter from Filippo Sassetti to Francesco I, the Grand Duke of Tuscany (Goa, 23 January 1586)²

I

Of the five India-bound ships that set sail from Lisbon to Goa in the spring of 1530, one fell behind and then disappeared somewhere in the Indian Ocean, finally slipping within sight of the Malabar Coast in late October, some five weeks after its companion vessels had made port. The figure the lost ship cut against the South Indian horizon was, for at least one contemporary, “haunting.” It appeared “all but abandoned” as its torn sails whipped uncontrollably “first in one direction and then another,” heaving the wooden

¹ ANTTC Parte I, mç.19, n. 102, f. 4. Because the script is so difficult to read, I have checked my translation against that of Armando Cortesão, ed., The Suma Oriental of Tomé Pires and the Book of Francisco Rodrigues (London: Hakluyt Society, 1944), 2: 517. My rendering of the phrase differs slightly from his.

vessel “wherever the wind might take it.” Left to the whims of wind and sea, the ship had veered far to the south of its intended port. A Portuguese armada patrolling the Malabar Coast intercepted it. On board, the living were found strewn across the deck, “wailing softly [and] crying out to God for mercy.” A mysterious affliction left them too weak to stand. Among the stricken passengers were Pero Lopes de Sampayo and Antonio de Macedo. Sampayo was to fill his appointment as the new Captain of Goa; Macedo was to become Judge General, the superior Crown magistrate for all of Portuguese Asia. The patrolling ships managed to convey the survivors to a hospital in nearby Cananor where, one by one, they died—Sampayo and Macedo among them—of some mysterious illness.\(^3\)

Goa was the heart of Portugal’s Asian trade empire\(^4\) (figure 3.1). This collection of islands on the coastal plane of western India was cordoned off from the interior by the high peaks of the Sahyadris—part of the Western Ghats, whose streams drained into to the Mondovi and Zuari rivers and fed Goa’s wetlands. Among the Konkani villagers who farmed rice in the Goa’s estuaries—taking advantage of the seasonal flooding of both rivers—there was a belief that none other than Vishnu himself reclaimed Goa from the seas.\(^5\) And indeed, the struggle for life at the mercy of a bountiful but unrelenting natural world would plague Goa under the Portuguese.

Before the Portuguese captured it in 1510, Goa was not a particularly notable port of trade. Diu and Cambay lay in Gujarat to its north and formed a commercial axis that


\(^4\) On this typology of early modern empires, see Michael Adas and Hugh Glenn Cagle, “Age of Settlement and Colonization, 1500-1900,” in Philippa Levine and John Mariott, eds., *Ashgate Companion to Modern Imperial Histories* (Burlington, VT: Ashgate, forthcoming, fall 2011).

\(^5\) Alice Cabral Caldeira Santiago Faria, “Understanding Pangim as a Transformed Landscape,” in Francisco José Gomes Caramelo, et al., eds., *Histories from the Sea* (New Delhi: Jawarharlal Nehru University Center for French and Francophone Studies, 2009), 93.
linked Malacca in the east to Hormuz and Aden in the west. Calicut and Cochin lay at the heart of the pepper trade on the Malabar Coast to Goa’s south. When the Portuguese first sighted its harbors, Goa was a tributary of the sultanate of Bijapur—a principality only recently carved from the larger Bahmani kingdom that ruled over much of the Deccan Plateau. Like their former Bahmani rulers, Yusuf Adil Shah and his successors in Bijapur traced their linguistic, cultural, and intellectual roots to the Persians, Turks, and Arabs across the sea. Bijapur—as would the other sultanates of the Deccan—maintained ties
that spanned Indian Ocean Asia. A small but thriving community of financiers, merchants, and traders—both Hindu and Muslim—carried a brisk maritime trade principally in Arabian horses but also in taffeta and satin woven further inland. Such a cosmopolitan entrepôt with safe harbors, lucrative commercial ties, and minimal defenses was—from the point of view of Portuguese raiders—an ideal target. On the advice of the Goan privateer and sometime trader Timmayya, the Portuguese governor in Asia, Afonso de Albuquerque, captured the city in 1510. In 1515 Goa replaced Cochin as the Asian terminus of the Lisbon voyages, and in 1534 it became the administrative capital of Portugal’s Estado da Índia. Its commercial wealth substantially underwrote Portugal’s empire until it was eclipsed by Brazil and the Atlantic in the middle of the next century.

Crown commercial policies in Asia targeted pepper, cinnamon, and other spices and were initially designed to allow the Portuguese to monopolize access to them and control their distribution westward. In practice—and notwithstanding the tremendous

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6 Richard M. Eaton, *A Social History of the Deccan, 1300-1761: Eight Indian Lives* (New York: Cambridge University Press, 2005), 33-104; S. M. Ikram, *Muslim Civilization in India* (New York: Columbia University Press, 1964), 107-121; João Manuel Pacheco de Figueiredo, “Goa Pré-Portuguesa,” *Studia* 12 (1963): 243-259. The priority given to this inheritance did not go unchallenged. With the disintegration of the Delhi sultanate, the Bahmani kingdom and the smaller principalities that were carved from it sponsored the translation of ancient Sanskrit texts into the local vernacular. And though Persian may have remained for a time the language of the court, the arts and sciences flourished as well in Sanskrit and, in Bijapur, state records were kept in Marathi, the language of the Hindu ministers who produced them. Eaton, *Social History*, 60-61; Ikram, *Muslim Civilization*, 118-119.


8 Bailey W. Diffey and George D. Winius, *Foundations of the Portuguese Empire, 1415-1580* (Minneapolis: University of Minnesota Press, 1977), 250-251. Timmayya’s was a strategic move for he was then in the employ of Vijayanagara.

9 Some qualification is necessary: Portuguese revenues in Asia derived from both the Estado (which was a vehicle for accumulating commodities in Asia for sale in Europe) and duties and profits from intra-Asian trade. Jorge M. Pedreira, “Costs and Financial Trends, 1415-1822,” *POE*, 58.
revenue they generated for Portugal’s counting house—their results were decidedly mixed. Control was elusive. Under orders from the Crown and the Casa da Índia, Albuquerque and his successors often failed to secure anything more than intermittent seaborne commercial primacy—and that along none but a handful of routes west of Cape Comorin. Yet as it turned out, anything more than limited control was unnecessary and even counterproductive. Profitable commerce both for metropolitan Portugal and for private Portuguese and other European traders owed itself to the persistence and vitality of intra-Asian networks of exchange. The cumulative effect of Crown policies on Goa was to transform it into a major center of seaborne commerce. Thinly curled sleeves of cinnamon from Ceylon; richly scented cloves from the volcanic soils of Ternate and Tidore; nutmeg and its bright red, delicate tendrils of mace from the Banda Islands; stacks of sandalwood from Timor, Siam, and Makassar; camphor from Borneo and Sumatra; musk from Tibet, Pegu, and northern China; white and black benzoin from Sumatra and Siam—these were only a fraction of the fruits, roots, leaves, seeds, and other items of naturalia that crowded Goa’s wharves. It was in many ways the heart of Portugal’s empire and its lifeblood was the bustling commerce in the products of nature.

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10 A detailed discussion of Crown policies is of course not my intention but it should be noted that individual spices were subject to different rules and regulations, all of which changed with time. On the accommodations worked out see Sanjay Subrahmanyam, The Portuguese Empire in Asia (New York: Norton, 1993), 66-78; Pearson, Merchants and Rulers, 39-56, 98-99. For a detailed discussion on trade in particular spices see M. A. P. Meilink-Roelofsz, Asian Trade and European Influence in the Indonesian Archipelago between about 1500 and about 1630 (The Hague: Martinus Nijhoff, 1962).

11 The effect of Portuguese involvement was not to displace preexisting networks but often to reorient them. Sanjay Subrahmanyam, The Political Economy of Commerce: Southern India, 1500-1650 (New York: Cambridge University Press, 1990); compare with the perspective in Pearson, Merchants and Rulers.

Abundance, mediated exchange, and the production of wealth were only part of the story. Goa’s relationship with the natural world was more troubled—its survival more tenuous—than the history of commercial expansion and imperial competition might suggest. What nature gave in abundance it could reclaim in torrential fits and widespread contagion. All seaborne trade across the Indian Ocean was timed to coincide with the Asian monsoons. The dry winds descending from the northeast posed little hazard for Goa as they pushed its spice-laden Portuguese fleets homeward across the Indian Ocean, past the Cape of Good Hope, and out into the South Atlantic. Trouble came between May and September with the southwest monsoons that carried ships eastward from Africa, the Red Sea, and the Persian Gulf to Gujarat, the Malabar Coast and Malacca. Inbound fleets faced heavy wind, dense sheets of rain, and wave upon wave in a voracious sea. It was one of these storms that split the fleet of 1530, that all but destroyed its lagging vessel, and drained the life of two imperial officials. Despite their hazards, monsoons were the chief engines of extended seaborne exchange in Indian Ocean Asia. Pilots of all nations had no choice but to harness their ships to the capricious power of these seasonal storms. For the Portuguese, the eastward crossing was a source of immense uncertainty. The force of mid-season gales was so great that it threatened to drive ships aground. Entry of Indian harbors was carefully timed with the end of these storms—and with little room for error: crossing too cautiously risked loosing the wind altogether and foundering in a listless sea.

Had Sampayo and Macedo lived to see Goa, they would have recognized in the city itself something of the storm-stricken ship that had brought them there. The summer monsoons beat upon Goa’s whitewashed churches, hospitals, and houses so violently that
façades were shorn of paint and left raw in their wake. New arrivals, sick and dying, crowded into Goa’s hospitals. The substantial medical infrastructure of Portugal’s Asian capital swelled to capacity and then burst. The city’s narrow alleys became makeshift shelters—the dank and fetid abode of last resort for many Portuguese immigrants. The vast majority who ventured east were poor men, often single, and when the time came they would be summoned to join one of the royal garrisons or serve aboard Portuguese fighting ships. Until then—and apart from the royal hospital meant to keep them alive—there were no formal arrangements to feed and house them. Many deserted, compounding a persistent shortage of personnel. Goa in autumn was damp, crowded, diseased, and unstable.

Cholera and malaria were endemic when the Portuguese took the city in 1510. As the sixteenth century wore on, the health of Goa worsened. Albuquerque wrote to D. Manuel I to urge caution, warning him of the immense human and financial toll that even the scattered enclaves of the Estado da Índia—the skeletal infrastructure of a seaborne empire—would demand of metropolitan Portugal. One year in Goa, Albuquerque

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15 Correia, *Lendas*, 2: 453, notes that a most common time to die was in the weeks just following the summer monsoons.

explained to his king, consumed “between six and seven hundred men . . . [who] died of illness” (doenças).¹⁷ Not even the highest ranks of Portuguese colonial officialdom were immune. Albuquerque succumbed to dysentery near the end of his governorship in the fall of 1515; nine years later malaria claimed the life of Vasco da Gama, the Portuguese ‘discoverer’ who had returned to fill his tenure as viceroy.¹⁸ An epidemic swept through the city as early as 1536.¹⁹ But it was in the 1540s—with successive waves of Portuguese settlement—that Goa’s physical and epidemiological landscape was transformed. Colonization displaced the Konkani communities whose wet-rice agriculture capitalized on the seasonal flooding caused by the summer monsoons. Their water management system quickly fell into disrepair. When Goa’s swollen rivers overflowed, whole parts of the city flooded. Water rushed into the streets, pooled, and made even main thoroughfares impassible. Goa’s first cholera epidemic swept through the city in 1543. Cholera was (and remains) a swift killer²⁰ but the 1543 outbreak was deadlier than most. So dire was the situation in the autumn of that year that Governor Martim Afonso de Sousa (1542-1545) refused to allow the tolling of church bells to honor the dead: such frequent soundings would, he feared, turn anguish into panic and lead to rebellion.²¹ Caught between the sea, the inland sierra, and the seasonal monsoons—on spits of land that only the might of a god could reclaim from the rush of coastal waters—Goa teetered precariously on the edge of debacle.

¹⁷ Bulhão Pato, Cartas de Afonso de Albuquerque seguidas de documentos que as elucidam (Lisbon: Acadêmia Real das Ciências, 1898), 2: 37.
¹⁸ Correia, Lendas, 2: 452-453.
¹⁹ Correia, Lendas, 3: 703.
²¹ Correia, Lendas, 4: 288-289.
Martim Afonso’s gubernatorial tenure was marked by more than just a sweeping outbreak of cholera. It coincided with the first years of a decade that was precarious not only for Goa but for the *Estado da Índia* more generally, as well as for private Portuguese traders throughout Indian Ocean Asia. In the early 1540s, famine had begun to plague the area stretching from the Red Sea to the Deccan. According to the chronicler Gaspar Correia, the situation in Choromandel was so dire that “almost the entire land was depopulated,” while in the major Arabian ports, the cost of the rice staple jumped.\(^{22}\) This shortfall was part and parcel of a broader economic downturn that embraced the entire region. No matter the reach, it dealt a severe blow to the economy of the Estado. Duties from two of its most important customs houses, Hormuz and Malacca, began to slacken in 1540, declined precipitously at mid-decade, and remained low as late as 1550. To Souza, an ambitious member of the service nobility who had helped salvage Portugal’s Atlantic economy (his brother, Tomé de Sousa, soon to be that colony’s first governor), there was little time to waste. In one account, no sooner had he arrived in May of 1542 than he “ejected [his predecessor, Dom Estevão da Gama,] from his bed, without even allowing him time to don his shirt.”\(^{23}\) As it turned out, Sousa’s policies would prove incendiary and his fear of rebellion in the midst of an epidemic may have been rooted in matters not entirely medical.

During his three-year term, Sousa launched a series of controversial measures, which, if intended to make up for diminishing returns on trade duties, fell short of the mark. These included a stopgap effort to raid a Hindu temple in Kerala and the launch of


\(^{23}\) Quoted in Subrahmanyam, *Portuguese Empire*, 92, though the source is not noted.
an ill-fated expedition to the mythical “Island of Gold” (Ilha do Ouro), then believed to lay somewhere in the vicinity of Sumatra. The governor also instigated a series of attacks against the Mappilas—Malabari Muslim converts resident in Cannanore and Cochin. The move abrogated a recent peace settlement and upset the thriving commerce between the Mappilas and many private Portuguese traders, casados, living up and down the Malabar Coast. Casados, many of whom came out to the Estado as unwed soldiers, had married and formed the core of a settled Portuguese presence in Asia, where they enjoyed rights and privileges as subjects of the Crown. Some of the most prosperous among them filled the ranks of Goa’s municipal council, the senado da câmara, and of the prestigious lay brotherhood, the Santa Casa da Misericôrdia. Through these two institutions, they dominated the local political affairs of Portuguese Goa. The casados, however, depended for their livelihood on commerce not plunder and Sousa’s actions strained the very delicate relations upon which that trade depended. Many among the settled Portuguese community, moreover, saw Sousa’s use of gubernatorial privilege as an abuse of power. The post of governor entailed the rights to a number of discretionary trading voyages. Sousa took full advantage of these but used his beneficence to reward them to none but a small coterie of family, friends, and allies. As if such exclusionary granting of privileges were not enough, he also used these voyages to gain access to spices, lac, and pepper in the Bay of Bengal—by now largely the de facto preserve of the casados. It was an unpardonable offense. Contemporaries would remember Sousa as arrogant, corrupt, and unyielding and complained about him bitterly—but often anonymously—in letters to Dom João III.24

24 Subrahmanyam, Portuguese Empire, 91-95.
Hostility between imperial officials and casados was a permanent feature of the Estado. Sousa merely had the dubious distinction of inciting particular hostility.\textsuperscript{25} The circumstances that greeted him in 1542 however—and many of the tensions that began to mount soon thereafter—were not of his making. In terms of both its food supply and its finances, Goa met the economic straits of the 1540s with a resource crunch of its own. The Jesuits—having arrived in Sousa’s retinue—wasted no time in championing the removal of irreligious Konkani peasants from their mainland villages just beyond the rivers that encircled Goa. The gradual decay of Konkani rice fields put the staple in even shorter supply. And that put the Portuguese enclave increasingly at the mercy of its neighbors for rice imports.\textsuperscript{26} Goa’s financial situation, meanwhile, mirrored that of the Estado. Formal transfer of the seat of colonial government from Cochin to Goa had taken place only ten years earlier, in 1532. By the time Sousa took charge, Goa’s was the principal customs house for all of Portuguese Asia. Most of its revenue came from policing the seaboard, often forcing Indian shippers into port to pay duties. Law enforcement required ships, sailors, and supplies, as well as the constant re-provisioning of Goa’s royal hospital—which served seamen and soldiers in the service of the Crown.

\textsuperscript{25} This division has continued to frame synthetic analyses of Portugal’s empire in Asia since Boxer’s foundational Portuguese Seaborne Empire and can be found in M[ichael]. N. Pearson, The Portuguese in India (New York: Cambridge, 1987); Subrahmanym, Portuguese Empire; and Malyn Newitt, A History of Portuguese Overseas Expansion, 1400-1668 (New York: Routledge, 2005). It should not, however, be drawn too firmly. Discord among officials and casados was as common as concerted action between them in pursuit of mutual interests. In the case of Goa and the western Indian littoral, see M[ichael]. N. Pearson, Coastal Western India: Studies from the Portuguese Records (New Delhi: Concept Publishing Company, 1981), especially chapter 3 on “The Crowd in Portuguese India,” 41-66; Isabel dos Guimarães Sá, Quando o rico se faz pobre: misericórdias, caridade e poder no Império Português, 1500-1800 (Lisbon: Comissão Nacional para as Comemorações dos Descobrimentos Portugueses, 1997); and the essays in Sanjay Subrahmanym, ed., Sinners and Saints: The Successors of Vasco da Gama (Delhi: Oxford University Press, 1998).

\textsuperscript{26} Such as the traders at Basrur on the Kanara Coast south of Goa; see Subrahmanym, Political Economy, 260-262.
All of that, in turn, required resources that Goa—an island—could not raise by itself. The city needed a hinterland. It was essential for defense, the collection of rents, the shoring up Goa’s food supply, and the harvest of raw materials—including timber for Goa’s dockyard—and for the continued recruitment of a soldiery. Such a hinterland was not secured until 1545, when negotiations with the Bijapuri sultan Ibrahim Adil Shah gave the Portuguese lasting control over the neighboring mainland territories of Salcete and Bardes.27

27 Newitt, *Portuguese Overseas Expansion*, 108-109. He reports that Goa’s customs house accounted for a full 63 percent of the capital’s revenue.
So in 1543, when the bells of its cathedral fell silent, Goa was caught in something of a double bind—one financial, the other epidemiological. Financially the Portuguese were affected at two levels: the resources of the imperial state were strained but so too were those of Goa and its casados. The epidemiological situation was, in part, an inescapable aspect of life in the area. But the demographic, hydrographic, and architectural shifts wrought by Portuguese settlement, together with the decline of wet-rice agricultural, exacerbated the threat of both hunger and disease. For Portuguese Goa to survive and remain profitable it had to reckon with the natural world in a way that went beyond commerce—the buying and selling of pepper and spices—to attend to the management of health and hence to wield the curative power of nature. The crux for officials like Sousa was that just as Hindu financiers and Muslim traders mediated Portuguese access to commoditized nature, so Hindu and Muslim healers dominated the practice of medicine, mediating access to the curative force of that same natural world.

From the perspective of Lisbon, these problems looked somewhat different. Both Dom Manuel I (1495-1521) and his successor Dom João III (1521-1557) recognized that a thoroughgoing inventory of Asian plants, their origins, and their uses would serve imperial interests. Neither of them needed reports from Goa to recognize their predicament. They had to look no further than the Praça do Comercio. That square in the mercantile heart of Lisbon fell within easy view of the royal palace, situated high in the hills surrounding the city. In the center of that praça stood the Casa da Índia, which presided over the city’s wharves, receiving cargos from Portuguese ships newly returned from Cochin and later from Goa. In the spring of 1519, in a fleet dispatched from Asia by the outgoing viceroy, Lopo Soares de Albergaria, came a heavy cargo of cinnamon. The
year before, Albergaria had managed to set up a fortified factory at Colombo. It was the first royal factory to be set up on Ceylon and this shipment of cinnamon was the first to be loaded and shipped by the Portuguese themselves directly from the island rather than purchased from middlemen on the Malabar Coast. But the Portuguese in Ceylon had little sense of what, exactly they were taking on and what were supposed to be the fine, aromatic, brown shavings bound for kitchens and apothecary cabinets in Portugal, Spain, Flanders and beyond, turned to be unidentifiable imposters. Customs officers at the Casa da Índia decided that as much as a third of what had been shipped was little more than a worthless simulacrum of the real thing. Fully one third of the cargo had to be burned.\textsuperscript{28}

As it had been purchased on the royal account, it seems that Crown revenue literally went up in smoke.

In fact, the burning of spices by officials at the Casa da Índia had become something of a seasonal ritual. The Portuguese humanist Damião de Gois, who spent part of his childhood in the royal household in these years, recalled near the end of his life the frequent sight and smell of these episodes as they played out in the Praça do Comercio.\textsuperscript{29}

Such scenes were the costly consequence of an identification problem and it was one that affected trade in the Crown’s most important commodity—pepper. Of the tiny dried berries that did more than any other product of nature (until sugar) to enrich royal coffers—there was immense confusion. Did black and white pepper come from the same

\textsuperscript{28} “Emformação que me dey symão allu`ez buticayro mor delRey noso sôr do naçymenuto de todelas droguas que vão pera o Reyno o quaoal ha XXXIX Anos `q serue nestas partes da Índia seu o ficio hom`e grandemente curyoso destas cousas,” ff. 13v-14, reprinted in Jaime Walter, “Simão Alvares e o seu rol das drogas da Índia,” \textit{Studia} 10 (1962): 136-149. Henceforth, “Emformação.”

\textsuperscript{29} Aubrey F. G. Bell, “Damião de Gois, a Portuguese Humanist,” \textit{Hispanic Review} 9 (1941): 244. Gois was a page between 1511 and 1523, at which time he left to serve João III at Portugal’s factory in Antwerp.
plant? Were they of equal quality? Might one be sold more profitably than the other? Crown ministers and metropolitan apothecaries could only speculate, which they did with guidance from ancient and medieval authorities like Dioscorides and Isidore of Seville. Yet four decades after the Portuguese first arrived to South Asia Martim Afonso de Sousa was still trying to puzzle out answers to these questions.

The problem of even definitively identifying—let alone acquiring—such valuables as pepper and cinnamon illustrate the distance—intellectual no less than geographic—that separated European buyers and consumers from the Asian flora they so desired. Gathering specimens of nature from their source, it turned out, was different than acquiring them on the praças of Lisbon or even on the market in Cochin. The two endeavors, collecting at the source and purchasing at the market, each required a distinct kind of knowledge. At the source it was not only a matter of discerning the fresh from the stale or spoiled. It was a matter of distinguishing between the thing itself and everything else that might look similar. Private traders, Portuguese functionaries, physicians, and apothecaries with long years of experience in Asia surely learned to navigate such colonial conundra with relative ease. Indeed to assure that only true cinnamon made its way from Colombo to Lisbon Dom Manuel wrote promptly to his new governor in Asia, who in turn charged the task to an apothecary with long experience in the markets of Cochin. That apothecary was to sort out the confusion over what was cinnamon and what was not.

It was a stopgap solution. The deeper problem was the highly circumscribed character of the empire itself and its singularly commercial orientation. The predicament of metropolitan policymakers of the Casa da Índia and advisors to the Crown, no less
than to newly-appointed officials in Goa was that network of garrisoned ports—that hallmark of the *Estado* begun by Albuquerque—was a purpose-built and distinctly coastal system. It was engineered to control maritime trade not to facilitate the investigation of nature. Small contingents of imperial officials generated records that could tell where, in what volume, and for what price the things of nature moved from point to coastal point. But once the vast Asian continental interior was in question the imperial system had little to offer. Yet it was precisely those expansive interiors that yielded commodifiable nature. What they needed was an inventory of nature that could make their Asian empire more legible so that was known among those Portuguese with long experience in Asia was known equally well not only to Crow-appointed officials in Goa but also to the Portuguese king and his advisors in Lisbon. And to do that they needed someone who could work at the margins of the official system in order to generate knowledge of the world beyond it.

The personal physician to Martim Afonso managed to do precisely that. Garcia de Orta created one of the earliest and most comprehensive Portuguese accounts—certainly the best known—of Asian naturalia was Orta’s *Coloquios dos simples e drogas e cousas medicinais da Índia*. Written by the Portuguese physician Garcia de Orta and published in Goa on 10 April 1563, the *Coloquios* was a natural history underwritten by the convergence in Goa of the many overlapping networks of commerce, medicine, knowledge, and naturalia. Orta set out to give his readers the most accurate and detailed

30 Here I work from Garcia da Orta, *Coloquios dos simples e drogas da Índia*, edited by Conde de Ficalho (Lisbon: Imprensa Nacional, 1895). Henceforth *Coloquios*. The original was published as Garcia d’Orta, *Coloquios dos simples, e drogas e cousas medicinais da India*, e assi dalgüas frutas achatadas nella onde se tratam algüas cousas tocantes amediçina, pratica, e outras cousas boas, pera saber cõpostos pello Doutor garcia dorta: fisico del Rey nosso senhor, vistos pello muyto Reverendo senhor, ho licenciado Alexos díaz: faltam desenbargador da casa da supricacçã inquisidor nestas partes (Goa: Joannes de Endem, 1563).
account possible of the “drugs and other medicines (sic),” as well as of the “fruits and spices” of “India.” The project would render plants and information about them communicable across regions where the Portuguese settled, worked, and traded, and therefore also fell ill and healed. This meant that Orta had to make the names of things in Lisbon correspond to the names of things in Goa, Diu, and beyond—wherever the networks of the Portuguese empire stretched. It was not a project to turn what is often termed “local knowledge” into “global knowledge” but to convert local names in Malabar, Gujarat, or the Deccan into the local names known among the Portuguese, be they in Malacca, Mozambique, Bahia, or the Maranhão.

Orta, a physician with connections to the royal household of Dom João III and an appointment as Chair of natural philosophy at Lisbon’s university, sailed to Goa in 1534. He did so as the personal physician to Martim Afonso de Sousa—the man who, as governor, would silence Goa’s bell towers in the midst of a cholera epidemic nine years later. Orta’s appointment to the would-be governor reflected the interconnections between disease, empire, and the production of natural knowledge. Sousa had already proven himself a valuable asset to D. João III in Brazil a couple of years earlier. Besides ridding the South American littoral of French interlopers, he championed the development of its earliest successful sugar plantations. Having proven his skill in strengthening imperial trade in the Atlantic, the king dispatched him to Asia, where as (capitão-mor do mar), Sousa was to protect and bolster the interests of the Estado da Índia wherever possible. Orta and Sousa thus shared an appreciation for the value of the

31 Orta, Coloquios, 1.
33 Schwartz, Sugar Plantations, 16-17.
things of nature. Orta’s first charge as an imperial agent was to keep Sousa alive and well. In Sousa’s company Orta traveled along India’s western littoral for the next three years. Diplomatic maneuvers between Portuguese officials and Indian rulers placed Orta in the company of Bahadur Shah, the sultan of Gujarat, Yusuf Adil Khan and his successor Burhan Nizam Shah, rulers of the Deccani kingdom of Ahmadnaggar to Goa’s northeast. Military campaigns took the physician to the Malabar Coast, Ceylon, and Cape Comorin. Orta settled in Goa in 1538 and from then on his travels were brief and intermittent. Sousa returned temporarily to Portugal; Orta set about practicing medicine in Goa and continued his own trading activities, begun earlier in Gajarat. Without an official appointment, he found it difficult to obtain permission to journey into neighboring lands. In Goa Orta served as the physician-general (*físico-mor*) under Sousa (governor, 1542-1545) and during the short-lived viceroyalty of Pedro Mascarenhas (1545-1555), who died after only months in office.  

Medicine supported imperial expansion just as the empire brought one of Lisbon’s foremost physicians into contact with the natural world of South Asia. The *Coloquios* drew on encounters, collaborations, and lasting relationships engendered by imperial diplomacy, military engagement, and colonial domestic interactions. To produce the text Orta combined information he collected from rulers, merchants, soldiers, and even traitors of the Portuguese state, together with that of *vaidyas*, *hakims*, and his own domestic servants in Goa. These exchanges took the form of shipboard chatter, bedside

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consultations held jointly with other specialists, casual household conversations, and rare audiences with powerful leaders; ships, households, and royal courts became settings for the exchange of rather specialized natural knowledge that helped sustain Portugal’s empire.

III

Garcia de Orta used the contacts enabled by the Portuguese empire to enhance not its grasp but its intellectual reach. In this, he was not alone. Orta resolved neither the confusion over cinnamon nor did he answer the questions surrounding pepper. His work was underwritten—and even framed—by the similar endeavors of two apothecaries. Tomé Pires and Simão Alvares wrote the first two reports that aimed to locate Asian flora within a familiar lexicon and to establish its dispersed origins within an unfamiliar Asian geography. In doing so, they helped to craft the cartographic imagination that would be indispensable for Orta later. They also articulated some of the problems that he would have to take up in the Coloquios. Taken together, Pires’s list of drugs submitted to Manuel I in 1516 and Alvares’s list sent in 1548 to João III were foundational in the construction of an imperial archive of natural history. Their work bore directly on that of Orta, the preservation Goa, and the profitability of the empire.

Pires sailed east with impeccable connections both to the royal household of Manuel I and the Casa da Índia. He and Dom Manuel had grown up together. His father had been the private apothecary of Manuel’s predecessor, João II, and Pires himself had worked in the same capacity for Manuel’s son and successor, the future João III. With the support of Jorge de Vasconcellos, then a minister of the Casa da Índia, and with the
encouragement of Dom Manuel’s personal physicians, one Diogo Lopes, the king dispatched Pires to Cochin, where he arrived in 1512 with a letter in hand, appointing him to the first factorship available. Albuquerque dispatched him immediately to Malacca, then the recently acquired redoubt on what was, for the Portuguese, the very edge of the known world. Pires spent the three productive years between 1512 and 1516.\(^{35}\) After his arrival, Manuel addressed to him a letter asking for details on some twenty-five plants associated with the easternmost reaches of the Mediterranean—items that the king and his ministers thought might have their origins somewhere in the Indian Ocean basin. Pires was to clarify those questions, identifying each item with as much certainty as possible and determining where it originated. Judging by the contents of Pires’s list—which included rhubarb, amber, and lapis lazuli—the king’s request was born of commercial interest more than curiosity. Pires dutifully explained which of these things were “valuable merchandise” and which were of such little value they ought to be “tossed into the sea.”\(^{36}\)

He could not have been better placed to respond to Manuel’s inquiry. It was in the long narrow maw of the Strait of Malacca that a profusion of *naturalia* converged—streaming down out of the Bay of Bengal to the northwest and from the South China Sea to the east. It was precisely that geography that presented a problem. In 1512, no one among the Portuguese knew much about it. The Southeast Asian coastline, at least as far as Sumatra had been tentatively traced onto maps, which circulated in Lisbon within the guarded halls of the *Casa da Índia*. They were later destroyed in the famous Lisbon earthquake of 1755. But Alberto Cantino, a spy in the employ of the Duke of Ferrara,


\(^{36}\) ANTT CC Parte I, mç.19, n. 102, f. 1.
smuggled a composite copy of them out of the city in 1502.\textsuperscript{37} And, as the Cantino Atlas (figure 3.3) silently disclosed for all to see, that vast labyrinth of islands and inlets to Malacca’s east had yet to make their mark on the cartographic imagination of Dom Manuel and his ministers. Brazil was there, marked by the exotic flora, fauna, and fresh air of Caminha’s letter. But with the exception of Sumatra, visible across the strait from the royal factory, the Sunda Islands were not. The \textit{oceanus yndiais meredionalis} was inhabited only by the bare navigational lines that charted nothing more than the extent of Portuguese ambitions.

For Pires that was no small problem. Dom Manuel had asked him to determine the origins of various plants. But how could he possibly assign individual plants to particular places when all that lay before him was undifferentiated space? Pires had first to fill in the map before he could situate plants within it. As the Cantino atlas testified, meaningfully defining places meant more than demarcating territory. Places were defined according to the human, physical, and natural geography that distinguished one place from another. They were defined, in other words, by what they contained. To constitute a

place in the imperial imagination, Pires had to compile details that facilitated distinctions. This could include notes on such things as local material culture or spiritual life—the stuff that made for what Anthony Pagden identified as the “origins of comparative ethnology.”\(^3^8\) It might include depictions or verbal descriptions of prominent geological formations—the Cantino map plotted the location of Serra Leão with an escarpment in the shape of a stone lion. Defining a place might also entail an account of the flora and fauna found to characterize it—plants and animals described or visually depicted even if they had not yet been named and thereby inserted into an expanding Portuguese lexicon. With imagery reminiscent of Caminha’s letter to Dom Manuel, the Cantino planisphere marked what was to become Portuguese America with a flock of colorful birds.

In similar fashion, Pires crafted his account of Asian flora for Dom Manuel. As of the date he signed it—27 January 1516—Pires had not yet traveled beyond the Strait. So he collected the necessary details from the sailors, traders, and other travelers who came and went in Malacca. Relatively few Portuguese were among them in this early period but Francisco Rodrigues was. Rodrigues was a pilot in the small fleet dispatched eastward from Malacca in November of 1511 by Albuquerque in the wake of his successful invasion that August. It was the first Portuguese fleet to make the run and by the time it returned to Malacca in December of 1512, Pires was there to inventory its cargo and gather any details that Rodrigues had to offer.\(^3^9\) The pilot was also handy with a pen. And if Rodrigues knew of the close relationship between Pires’s and Dom Manuel then he probably also shared with him a set of elaborate illustrations that he would later


From an ensemble of some of the several sketches from the Livro de Francisco Rodrigues, this is a panoramic view of Flores Island (Ilha das Flores or Samademga). Cortesão provides the names of several of these plants (Cocus nucifera Lin., Gynandropsis gynandra Briq., Imperata cylindrical Beauv., and Alocasia macrorrhiza Schott), found throughout the Lesser Sundas. Rodrigues drew them with enough care that they could be identified by later travelers, thereby helping to construct the islands as a known place. Cortesão, Suma Oriental of Tomé Pires and the Book of Francisco Rodrigues, xci-xcv; the image is on an unnumbered foldout between xciv and xcv.

dedicate to the king (figure 3.4). Rodrigues’s drawings captured precisely the kinds of details that could find their way onto the imperial map: depictions of the architecture, prominent flora, and coastal topography of many of the Sunda Islands. As Albuquerque wrote to Dom Manuel in the months leading up to his Malacca invasion, these kinds of maps would allow the king, “to truly see . . . the course your ships must take to the Clove Islands, . . . and the islands of Java and Banda, of nutmeg and maces[.]

With these kinds of accounts to hand, Pires wrote a list that simultaneously conjured a geography and succinctly located within it the flora of interest to Dom Manuel. This involved a bit of linguistic finesse. What Pires knew of East Asian geography was now considerably more detailed than what his sovereign knew. So every

40 Quoted in Cortesão, Suma Oriental of Tomé Pires and the Book of Francisco Rodrigues, lxxviii-lxxix, from an unspecified source.
explanation had to be moored to known places and practices. When he wrote, for example, that the highly valued cebulic myrobalan came from “Bengal, Malacca, and Borneo,” he took care to weave a cartographic tapestry that located seemingly arcane and unfamiliar paces using familiar ones as orienting points: “Bengal borders on Orissa on one side and Arakan on the other. Malacca [borders] on Kedah on one side and Pahang on the other. Borneo are islands (sic) two hundred leagues east of Malacca. These islands have much gold, edible camphor, and these myrobalans.”\textsuperscript{41} Taken alone, these references were incomplete. Did Dom Manuel or the ministers of the \textit{Casa da Índia} understand the whereabouts of Orissa, Arakan, Kedah, or Pahang? Probably not by this entry alone—but Pires clarified each in his coverage of other things. So in his entry on incense, Pires noted that Orissa lay “between Narsinga and Bengal.”\textsuperscript{42} Hence between these two entries alone, officials in Lisbon could make some sense of this profusion of place names: Orissa separated Bengal from Narsinga (Vijayanagara), which lay next to Malabar. The entire chain of unfamiliar places was anchored by the Malabar Coast. He knew Manuel could locate the lengthy Malabar Coast easily enough. It was, after all, where the \textit{Estado’s} administrative heart of Cochin was and where nearly all of the empire’s pepper left port for Lisbon. Pires used this technique in almost every entry on his list, steadily, if tediously, constructing an intelligible geography within which to place the things of nature that most interested Dom Manuel and his circle. And often the entries linked not only drugs and places, but also people and uses: inhabitants of Borneo not only possessed cebulic myrobalan but camphor of such quality that they could eat it directly.

For Pires, talking about plants and (where possible) their uses meant talking about

\footnotesize\textsuperscript{41} ANTT CC Parte I, mç.19, n. 102, f. 2v.
\footnotesize\textsuperscript{42} ANTT CC Parte I, mç.19, n. 102, f. 2.
places and peoples. This kind of overlapping of concerns was part and parcel of a tradition of travel writing and map making that linked Herodotus and Marco Polo to the earliest Portuguese accounts of West Africa, Vijayanagara, and, later, South America.\textsuperscript{43} The tradition led to the production of ornately and colorfully illustrated maps by numerous sixteenth-century European cartographers.\textsuperscript{44} It was not a Portuguese innovation. But wielding it in order to fashion a focused account of commodifiable flora from the unfamiliar islands east of Malacca was a step compelled by the peculiar challenges that Pires faced in the early years of the \textit{Estado}.

Thirty years later, Alvares faced the opposite problem. The Portuguese had been embroiled in trade disputes in the Moluccas since the 1520s.\textsuperscript{45} By the late 1540s, accounts of the region’s politics, commerce, and geography had established a shared lexicon of peoples and places to which officials in Lisbon and correspondents throughout the \textit{Estado} could refer. Rather than situate a limited range of \textit{naturalia} within a makeshift geography crafted from disparate elements, Alvares had to place an expanding number of natural things into an extensive and largely familiar geography. He relied upon this shared cartographic understanding when he organized his list to Dom João. The Strait of Malacca remained the pivotal point of orientation and Alvares began his account of Asian


\textsuperscript{45} Roelofsz, \textit{Asian Trade}, 153-172.
naturalia with the items known to come “by way of Malacca,” that is, from everywhere east of the Strait. The entry was subdivided so that items were discussed according to their place of origin moving from east to west, beginning with the camphor that came from China and ending with the cubebs from Java. Having dispensed with the flora of region beyond the Strait, Alvares then moved on to that which originated in the Bay of Bengal, which spread out northwest of Malacca. Next came the drugs of the Malabar Coast to Goa’s south, followed by those of the coast between Goa and Cambay. Alvares closed with a discussion of the Arabian ports of Hormuz and then Aden. And just as he had handled the region east of Malacca, so too within each of these other regions as well: Alvares tacked slowly from east to west, describing each specimen of nature in its turn according to its understood place of origin. The account of nature that began with Chinese camphor thus ended with the rhubarb taken by Khorsani traders to Hormuz.

Alvares had created a map in the form of a list. He could do it thanks to the inventory of nature and places inaugurated by Pires and his contacts. But like any other map the list reflected as well the extent and limitations of the Estado da Índia. If the Portuguese now had ports that fanned out across the Indonesian archipelago, they had made little headway in China or beyond the Strait of Hormuz. In consequence, several items resisted such easy geographic compartmentalization. The origins of a certain salt that came to Hormuz from either “Persia” or “Mecca,” simply could not be pinned down. For João de Barros and other officials then staffing the Casa da Índia all of this would have been immediately recognizable.

There were other issues that Pires had not been able to resolve so handily. And on

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46 Enformaçõ, 14.
47 Enformaçõ, 17v.
these, Alvares’s contribution was more substantial. The identification of a medicinal substance called “liquid storax,” for one, proved especially problematic and to Dom Manuel’s inquiry, Pires reported frankly, “I do not know what liquid storax is . . . nor did the apothecaries with whom I studied.” Pires noted that what passed under that name in metropolitan Portugal was a substance that arrived by way of Venice. He explained that among Iberian doctors (doutores) “liquid storax” was thought to be a medicinal simple—a single substance derived from a single plant or mineral. But based on his limited sojourn in the Indian Ocean, Pires had been given to understand that what was traded under that name in Aden was made of ingredients that included “yeast, honey, and oil”—a concoction, he pointed out, which was “good merchandise here [in Cochin], and of good value.”

In “liquid storax,” in other words, Pires was confronted with what might have been two very different substances traded under the exact same name. Were they the same? It was possible but not certain enough for Pires to stake a claim to it. Pires committed himself only to the suggestion that what was meant by “liquid storax” depended on where one was. The references to Venice and Aden were important. It was the closest to certitude that Pires was able to get: if the drug could not be identified with certainty, then at least it could be anchored to peoples and places that were. The question of “liquid storax” was therefore an open one when Alvares was asked to submit a report to João III. For Alvares, this “liquid storax” was composed of several different substances, the principal of which was called aguyla, though “no one knows the truth of its origins.”

48 ANTT CC Parte I, mç.19, n. 102, 4.
49 Enformação, f. 14v-15.
The confusion caused by divergent claims about potentially distinct substances traded under the same name was one of the central problems that Orta would have to resolve in the *Coloquios*. Orta, however, was a physician. He had philological training that enabled his to grapple with this and other problem in ways that apothecaries like Pires and Alvares could not. By combing through the work of Avicenna, Orta was able to identify the “aguyla” of Alvares, and therefore the “liquid storax” of Pires, with a plant he referred to as *aguila brava*, and which came, so he claimed, from beyond the Ganges River. But if Pires, Alvares, and Orta were part of a single intellectual community at work in the service of the Crown, professional training was nevertheless one important marker of difference between them. And that difference had implications for the way that natural knowledge was secured. The debate over pepper dramatized the tensions between a physician and an apothecary in the making of natural knowledge in Portuguese Asia.

Orta never met Tomé Pires. But by the time Sousa appointed Orta physician-general of Goa, Alvares had been living in the city for almost a decade. When the governor sought clarification on the nature of pepper, it was to both Orta and Alvares that he turned. The substance of that conversation can be summed up easily: Orta and Alvares—the physician and the apothecary—disagreed. Orta, citing Dioscorides, Pliny, Galen, Isidore of Seville and, “all the Arabs,” argued that pepper was of two kinds—one black, the other white—and that the two varieties came from different trees. He insisted that many Portuguese who were “not very curious” could not tell the difference between them but that Indians along the Malabar Coast certainly could. At this, Alvares scoffed. He insisted that Orta was mistaken and to prove the point, Alvares explained what had
happened on a voyage he took to Lisbon in the spring of 1530.\textsuperscript{50} He was then traveling with a cargo of pepper when, somewhere off the coast of Mozambique, the ship began to take on water. The fleet dropped anchor at Mozambique Island and the pepper was transferred to a seaworthy vessel. Alvares, explained that while he was handling the pepper he saw that corns of what at first looked like black pepper began to shed their outer covering to reveal a white rind. Alvares took this as evidence that black and white pepper were indeed the same thing.\textsuperscript{51} Orta heard him out but promptly objected. He pointed out that in such a large cargo of black pepper, one was sure to find occasional traces of the white kind. But he reasoned that if white pepper were merely black pepper that had shed its covering because of the jostling and rubbing of transit, then the white pepper first found at Mozambique would have multiplied by the time it reached the Casa da Índia. Indeed, officials at the Casa would have found themselves inundated with white pepper when they had expected black. And, so argued Orta, that was not what happened.\textsuperscript{52}

Sousa, having heard the exchange, had no idea whom to believe. Orta’s deductive reasoning was as impeccable as the list of ancient authorities he cited to support it. But the evidence of experience mustered by Alvares was just as compelling. For his part, Alvares readily conceded his initial faith in the wisdom of the ancients. He explained that while in Cochin he had heard the scribes of the Raja of Cochin suggest that the two varieties of pepper were one and the same but had thought it preposterous because it ran “counter to what the ancient authors had written.” It was only after he had moved “with my own hands” some two or three arrateis of pepper that Alvares was compelled to

\textsuperscript{50} Orta, Coloquios, 373-374, provides the physician’s account and Alvares’s reacton to it.
\textsuperscript{51} Enformação, f. 15v.
\textsuperscript{52} Orta, Coloquios, 374.
change his mind.\textsuperscript{53}

On the face of it, the decision that confronted Sousa is one familiar to many students of Iberian science. Jorge Cañizares-Esguerra has been perhaps the most vocal proponent of the view that Spanish and Portuguese endeavors abroad ushered in the modern epistemological era characterized by a deep concern with and respect for the kind of empiricism that would later underwrite Baconian experimentalism.\textsuperscript{54} From this perspective, the governor stood at an epochal precipice where two distinct and even mutually exclusive world-historical eras collided. Was he to side with Orta and the long-established tradition of textual exegesis? Or was he to follow Alvares and align himself with the empiricism so often taken as the harbinger of a scientific modernity? With so much at stake it might come as a disappointment to some readers to find that Sousa, in effect, punted. As Orta recorded in the \textit{Coloquios}, Sousa wrote to the king of Cochin for clarification and received in return a small sack of white pepper, along with a cursory note stating that “he [the king] had many trees of the white kind in his territory [of Cochin].”\textsuperscript{55} For the governor, the issue was not an epistemological one—at least not in the sense that it pitted textual authority against that of experience. It was instead about how an individual’s claims might best be substantiated—regardless of the \textit{kind} of

\textsuperscript{53} \textit{Enformação}, f. 15.


\textsuperscript{55} Orta, \textit{Coloquios}, 374.
evidence deployed. And the truth about nature—be it built upon the weighty edifice of ancient wisdom or the fleeting evidence of experience—was constituted by the agreement of opinions among members of the broader network to which Sousa and Orta had ready access.

Witnesses and corroborating testimony were instrumental in constituting the truth about nature. Sousa, Orta, and Alvares each in their own way recognized this point. Sousa and Orta had insinuated themselves as best they could into intra-Asian networks. Sousa was at the time on good terms with the leaders of Cochin. Orta’s occasional presence at the courts of Bahadur Shah and Burhan Nizam Shah was enabled by similar diplomacy. Orta’s particular expert knowledge of Ancient Greek and medieval Arab writers provided common intellectual ground for his exchanges with Arab physicians. Their medical learning was grounded in many of the same texts and they could readily refer to and discuss the same passages. It was in that way that Orta’s professional training would ultimately distinguish his techniques of knowledge production from those of his apothecary colleagues: that background sustained the personal affiliations that constituted a network to which neither Pires nor Alvares were privy. Alvares knew just as well how important personal affiliations were in the certification of natural knowledge. Back on Mozambique Island in 1530, with white and black peppercorns working themselves through his hands as if in a sieve, the very first thing Alvares claimed to have done was to gather corroborating witnesses. He immediately reported his findings to the treasurer and the fleet captain. And once he arrived to Portugal, it was to a select group of physicians and apothecaries that he submitted his opinion and the evidence for it—with the official
standing of his witnesses in all likelihood lending weight to his testimony.\textsuperscript{56}

At issue in the question over pepper were not so much the distinct and mutually exclusive epistemologies of a physician and an apothecary but the distinct networks of affiliation in which they were situated. To be sure, the first generation of Portuguese naturalists in Asia constituted an intellectual community. Orta’s investigations depended heavily on the work of Pires and Alvares before him, and therefore on a whole gamut of seamen like Rodrigues, dispatched in the interests of the Casa da Índia. His remark that pepper was spread from Malacca, Martaban, Java, and Pegu represented the articulation of an established fact that would have been unthinkable without the investigative work of those before him. But the medical and commercial challenges of expansion and settlement had—over the course of the sixteenth century—given rise to two different, though never entirely distinct, intellectual networks.

If Goa had become the focal point for a combination of medical and commercial pressures, the imperial and colonial perspectives on how those problems should be handled began to diverge almost immediately. For the Crown and ministers of the Casa da Índia, the problem was one of facilities, personnel, and financing. Better identification of all manner of naturalia would allow the Crown and ministers at the Casa to tighten their grasp on trade in certain goods while generating revenue and a ready store of materia medica sufficient to sustain Goa’s royal hospital. Specific medical concerns emanating from the colony—usually in correspondence from the senado da camara—were handled on an ad hoc basis. Pires and Sousa were part of the first generation of medical specialists to have inhabited the multiplying minor medical posts that helped constitute the empire. In that way, they were among its commonest agents. But Pires and

\textsuperscript{56} Enformação, 15v.
Alvares also stood apart. Both were, in albeit very different ways, deeply insinuated within the imperial administrative apparatus. It was that inextricable link that made them such reliable informants on the natural world. And yet their attempts to sustain confidence of the Crown—their entanglement in the relations of patronage that comprised the imperial web—ultimately proved their undoing. Orta would later learn that lesson too.

Pires sailed east with impeccable connections both to the royal household of Manuel I and to the Casa da Índia. He had known the king since childhood; indeed they had grown up together. His father had been the private apothecary of Manuel’s predecessor, João II, and Pires himself had worked in the same capacity for Manuel’s son and successor, the future João III. With the support of ministers in the Casa da Índia, and with the encouragement of Dom Manuel’s personal physician, the king dispatched Pires to Cochin, where he arrived in 1512 with a letter in hand, posting him to the first available factorship. Almost immediately, Albuquerque sent him to Malacca. When natural knowledge had to be of unquestionable veracity, the Portuguese ruler turned to an expert on medicinal plants posted in one of the most important commercial ports that the Portuguese then controlled. But he also turned to a longtime acquaintance—the friend of old to whom he had once entrusted the health of his heir. After three very productive years in Malacca, Pires had expected to return to Lisbon and was on his way when, during a layover in Cochin, he was appointed as an ambassador to the Chinese emperor. He could hardly say no. But the embassy was a disaster. Pires, an apothecary of the royal court, a masterful bureaucrat, skilled collector of information, and a loyal servant, wound up in shackles in a prison in Canton, accused of espionage. Rumor had it that he died in
prison, though years later a Portuguese adventurer in Canton met a young woman claiming to be his daughter.\footnote{This remarkable story is sketched out in Cortesão, ed., \textit{The Suma Oriental of Tomé Pires and the Book of Francisco Rodrigues}, xviii-lxiii.}

Alvares was a career functionary who spent most of his life on the Malabar Coast. His early career was undistinguished and he rose only slowly to the pinnacle of colonial medical officialdom. He had come to Asia in 1509, when the \textit{Estado} was in its infancy, when Cochin was its administrative center, and when plans to capture Goa had scarcely been hatched. By the 1510s he had managed to distinguish himself from among growing number of Portuguese apothecaries then plying their trade and trafficking their expertise on the Indian littoral. It was Alvares who was called on to settle the cinnamon question in the 1510s. And when Dom João de Castro replaced Martim Afonso de Sousa in 1545, he chose Alvares as his personal apothecary. Castro’s family ranked among the upper nobility of the Portuguese court and the viceroy would go down in the history of Portuguese Asia as, among other things, the illustrious conqueror of Diu. It was during one of a series of pitched battles for that lucrative Gujarati port city that Alvares jumped into the fray to care for Castro’s wounded men. The move earned him a glowing commendation from the viceroy. And that probably also earned him the confidence of João III. Castro later appointed Alvares to clarify the origins of the whole gamut of commodities then traded on the royal account. Alvares was an assiduous keeper of accounts. In his letter of 1548, he reported that Dom João’s factor in Bassein was defrauding him.\footnote{Enformação, f. 18v. The issue reported by Alvares seems to be that the royal factor in Bassein was charging the Crown for turbith purchased from Mangalor at market price when, according to Alvares, it could be harvested in the hinterland of Bassein for less. The king, Alvares suggested, should only have to pay the laborers. The factor, whom Alvares does not name, knew} Rooting out swindlers, however, turned friends and colleagues into
enemies. When Alvares inspected the Portuguese factories of the Malabar Coast as apothecary general, he was greeted with hostility and resentment. Despite his expertise, Alvares was a pariah, bereft of all credibility beyond official circles. His letter to João III emphasized his isolation, poverty, and his long and arduous work in the service of the Crown.\(^{59}\) Certainly he was posturing before the royal benefactor. But it also seems the aging Alvares had neither the means nor (anymore) the local relations to support himself. His life and livelihood now depended heavily on royal patronage and on the thin twine of relations linking Goa to Lisbon. He disappeared without a trace after his missive of 1548.

Their position within—and apparent dependence upon—royal patronage determined the substance of their work. Both apothecaries wrote at the behest of the Crown and the Casa da Índia. Accordingly, the interest they brought to their work was not so much that of colonial health as of metropolitan wealth. And their lists focused almost exclusively on the names, descriptions, and origins of various plants, whose medicinal qualities generally went unnoted. Neither Pires nor Alvares said much beyond what was asked of them. Alvares added only the desperate reminders of his long and dedicated service. Pires said even less—and he did it in a postscript, an unassuming addendum of unsolicited pecuniary advice: he told Dom Manuel that he need not send medicines from the kingdom Asia, for “all would be wasted.” Sailors would pilfer the sweetest comestibles while the others rotted in the heat and humidity of the hold. Instead, Pires wrote, “all things can be settled here with things that exist here” and pointed out that “compound medicines can be made by the apothecaries, surgeons, and physicians, as

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\(^{59}\) Enformação, ff. 13v-14, 18v.
that is what they are paid for.”

For Sousa the solution to Goa’s ills was as much a matter of managing sickness and health as it was improving its commercial fortunes. As Orta remarked, Martim Afonso was a governor “with a great interest in medicines.” That meant identifying, accumulating, and properly using specific medicinal plants in response to particular medical emergencies—one like the intractable cholera epidemic of 1543. Hence Orta’s emphasis on medicine spoke more to colonial as opposed to metropolitan interests. From the perspective of Sousa in Goa, Orta’s work was indispensable. But from the perspective of João III in Lisbon, it was marginal. Indeed, in Lisbon, interest in Orta’s work came not from imperial ministers but from a growing community of naturalists whose concerns were far removed those of João III and his circle.

IV

Knowledge travels and is changed in the process. The story of the *Coloquios* and an account of the techniques of knowledge production that underwrote it—and which therefore helped sustain Portuguese settlement in Asia—can only begin in Goa. There, Orta was part of a distinctly cosmopolitan milieu that included people of diverse faiths, ethnic and linguistic backgrounds, and regional extractions. But he was also a university-trained physician with high-ranking contacts back home. Even as it addressed the immediate concerns of the Portuguese in Goa, the *Coloquios* simultaneously spoke to the interests of a growing community of naturalists from Lisbon to northern Italy, and across northern Europe. Orta’s book was—at least in part—his answer to the urgings of the

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60 ANTT CC Parte I, mç.19, n. 102, f. 4.

61 This was also true for Dom João de Castro, Sousa’s successor in Goa, who ordered that many of the Konkani farmers be encouraged to resettle in Goa.
Sienese physician and professor of medicine, Pietro Andrea Mattioli, and the inquiries of Tomás Rodrigues, Orta’s friend and a physician of the royal court in Lisbon. Mattioli, a controversial and cantankerous figure, was best known for his commentary on Dioscorides, which, after its publication in Venice in 1555, became the most widely used textbook on materia medica in late-sixteenth century Europe. Mattioli wrote to Rodrigues, insisting that the Portuguese physician and his colleagues in Lisbon capitalize on their direct access to Asian naturalia in order to clarify some of the confusion surrounding the drugs of antiquity. Rodrigues apparently thought the suggestion a good one. But he believed that Orta, at work in Goa, was best positioned to carry it out.

With a ready market for the kinds of knowledge it contained, the Coloquios itself—like the medicines and spices it detailed—quickly became an object of trade and, within nine months of publication, copies arrived to metropolitan Lisbon. In January of 1564 one of these came to rest in the hands of Dutch naturalist Carolus Clusius. The well-known story is that Clusius republished Orta’s text in Latin just in time for the Frankfurt book fair of 1567, in order that others, as he stated in the prologue, “could enjoy the utility of this book.” From this Latin version came the numerous subsequent vernacular translations—in French, Spanish, Italian, German, and English—that made their way into the university catalogs and private libraries of Europe. Countless artists, sculptors, printers, merchants, and many others who made up the emerging and increasingly heterogeneous community of naturalists in late-sixteenth century Europe gained access to

\[63\] Orta, *Coloquios*, 135.
the work of a Portuguese physician and the expertise of his collaborators a world away.\textsuperscript{65} Clusius’s Latin translation of Orta’s book brought both men to prominence. And it established Orta’s reputation as Europe’s best contemporary authority on Asian materia medica.\textsuperscript{66} In its precise detail, Orta’s compendium of natural knowledge was subject to further revision and refinement. But its circulation made Asian flora and fauna familiar in the West long before the English, French, or Dutch managed to build South Asian outposts of their own. And once they came, the \textit{Colloquios} continued to guide them.\textsuperscript{67}

\textsuperscript{65} Clusius’s 1567 Antwerp original went through several editions—1573, 1574, 1579, and 1582; one of these was republished by the printers Viduus and Joannis Moretus in 1593. The seventh volume of Clusius’s \textit{Exoticorum libri decem} (Antwerp, 1601) also contains a version of the \textit{Colloquios}. Aníbal Briganti translated Clusius’s version of Orta’s work [from the volume that included Monardes?] in Venice in 1575 by the Zenari brothers. This was the first of several Italian versions of the \textit{Colloquios}. Others followed by the Zenaris in 1582 and, also in Venice in the same year, by Francisco Ziletti. Ziletti published another edition in 1589. Three editions came out of Venice in 1597; one by Juane Zenaro, another Girolamo Scotto, and the third of unidentified origin discovered by a bibliographer several years later. A final Venetian edition came out in 1616 and in the same year, another was printed at Siena. On the other side of the Mediterranean in Spain, the surgeon Juan Fragoso relied on Orta when he published his \textit{Discursos}, which came off the press of Francisco Sanchez in Madrid in 1572. Clusius’s translation of Orta was rendered in Spanish by one Fernando Diaz and published in 1580. In Strasbourg, Israel Spach published his translation of the Spanish surgeon Fragoso’s \textit{Discursos}—again based on Clusius’s version of Orta’s book—in 1600 or 1601. In the form of Fragoso’s book, Orta’s research appeared—somewhat surprisingly—in Argentina in 1601. Cristóvão da Costa’s well-known \textit{Tractado de las drogas y medicinas de las indias orientales} came out in Burgos in 1578 as a revised, corrected, and amplified version of Orta’s book (based at least in part on Clusius’s Latin version)—which Clusius also translated and published in Antwerp in 1582 and then again 1593. At least three versions of Orta’s Latinized work came out in French. Authored by Antoine Collin and published by Jean Pillehotte in 1609, 1615, and 1619. Maximiano Lemos, \textit{Archivos de Historia da Medicina Portuguesa} v. 2 (Lisbon, 1887-1888), 90-92; and Carvalho, \textit{Garcia d’Orta}, 130-133. Although it appears unlikely, there is some confusion about whether or not a version of the \textit{Colloquios} existed in English before Sir Clements Markham, \textit{Colloquies on the Simples and Drugs of India by Garcia da Orta} (London: Henry Sotheran and Co., 1913). See Carvalho, \textit{Garcia d’Orta}, 133.

\textsuperscript{66} Ogilvie, \textit{Science of Describing}, 60.

\textsuperscript{67} Ambroise Paré, \textit{The Apologie and Treatise of Ambroise Paré, Containing the Voyages made into Divers Places with many of his writings upon Surgery}, edited by Geoffrey Keynes (London: Falcon Educational Books, 1951), 198-200, rejected Orta’s claim on the efficacy of the bezoar stone. Clusius put to use knowledge gained from his work on the \textit{Colloquios} when he created the botanical garden of Emperor Maximilian in Vienna and later in his work as honorary professor of botany at the University of Leiden. The physician Jacob Bondt (Jacobus Bontius), in his own work on South Asian medicine, \textit{De medica Indorum} (Leiden, 1642), relied heavily on
Yet the book that debuted in Frankfurt in 1567 was much more than a mere translation of the *Coloquios*. Clusius had not only rendered in Latin the original Portuguese of its author. His *Aromatum et simplicium* represented a substantial reworking of Orta’s text. In the opening dedication of the *Aromatum et simplicium* Clusius offered an account of these revisions and the reasoning that lay behind them: “I passed [the text] into Latin and then reduced it to a summary, arranging each chapter into a more accommodating order than what it had been, rejecting some things that seemed to me to be unnecessary.” That was an understatement; Clusius had virtually transformed Orta’s work. Orta composed the *Coloquios* as a dialogue. His chapters—fifty-nine in all—were arranged in alphabetical order according to the vernacular Portuguese name of the flora (and fauna: one chapter addressed elephants) in question. Some chapters included several plants together. And besides an account of these—including their humoral aspect, medicinal uses, and a careful description—most chapters also included notes on current market prices, major ports of trade for each item, details on regional politics, and the choicest bits of gossip on domestic life in Goa. To Clusius, so much of what Orta had written was useless verbiage and, “as often happens with dialogues,” much else was, according to Clusius, “needlessly repeated.” The Dutchmen did away not only with what he deemed repetitious passages but with Orta’s dialogic style altogether, replacing it instead with the unadorned prose of expository reportage. He rearranged Orta’s

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alphabetical chapters into two books, the first on “aromatic plants” the second on “some Indian plants.” His chapters were not in alphabetical order. Instead, the Aromatum et simplicium included a table of contents. In lieu of Orta’s anecdotal portrayals of daily life in Goa, now expunged, the Dutchman introduced material from André Thevet’s journey to South America. And where Orta had relied on the power of verbal description alone to convey a sense of the specimens of the natural world as he encountered them, Clusius added twelve roughly hewn woodcuts, “procured [in an effort] to describe as well as possible the drugs” in question.\footnote{Clusius, Aromatum et simplicium, 5, 40, 47, 72, 94, 102, 106, 114, 119, 140-141, 151, 159, 182, 228-230. Thevet was in Brazil between November 1555 to January 1556. The combination of their work was aided no doubt by the fact that the printer, Christopher Plantin, also printed Thevet’s 1558 Singularitez de la France Antarctique. Indeed Plantin may well have insisted on reusing some of that material so that Clusius’s book would be more marketable.}

The transformation of Orta’s original work was more than an inconsequential aspect of the circulation of natural knowledge. Both Orta, in the Coloquios, and Clusius, in the Aromatum et simplicium, sought to accumulate and organize knowledge about the natural world beyond Europe. And to be sure, the two naturalists shared a fundamental sense of what kinds of information were appropriate to the production of natural knowledge—what sorts of details were required to produce an accurate inventory of nature. In this, the Coloquios and the Aromatum et simplicium evinced the common intellectual framework of their authors—one heavily influenced by their humanist medical training and modeled on the work of Dioscorides. To each plant, the first century Greek physician devoted one chapter. And within each chapter he followed the same general format: he began with the name of a plant, offered details about its habitat, appearance, medicinal properties and proper uses, discussed harvesting and storage, the identification of false or adulterated specimens, and closed with such details as veterinary
or non-medical uses.\textsuperscript{70} Published studies of nature for most of the sixteenth century—including both the \textit{Coloquios} and the \textit{Aromatum et simplicium}—were generally concerned with securing this kind of knowledge about the natural world.

The differences in how they understood and executed their work might be interpreted as an effect of the generational shifts and distinct regional tendencies that came to characterize the study of nature and the presentation of natural knowledge within the West. Orta’s education began sometime in the 1510s and took him to Salamanca and Alcalá de Henares. By 1527 he had moved to Lisbon and, in 1530, was named Chair of natural philosophy at Portugal’s sole university.\textsuperscript{71} At that time Clusius was still a young boy at his parents’ home in Artois, just south of Antwerp. The study of nature and the conventions which governed the presentation of natural knowledge in the in the spring of 1534—when Orta boarded the \textit{nau} Rainha to sail for Goa—differed from those which Clusius would consider over thirty years later when his Iberian sojourn brought him Lisbon and into possession of Orta’s book.\textsuperscript{72} The methods employed in the study of nature, the symbolic meaning of natural objects, the uses to which they were put, and the conventions that governed the textual presentation of natural knowledge had each become more diverse over the course of the sixteenth century.\textsuperscript{73} Orta and Clusius belonged to different generations of naturalists.


\textsuperscript{71} He left for Goa on the 12 March. These and other details can be found in Walter, “Garcia de Orta.”

\textsuperscript{72} Cook, \textit{Matters of Exchange}, 85.

Neither Orta nor Clusius saw it that way however. For his part, Orta was aware that his own project differed substantially from that of his colleagues in the West. “Some day a little book may be printed, making a joke of me, or showing up my errors and badly arranged reasons,” he wrote at the opening of the *Coloquios*, deeply aware that his own work was considerably removed from the that of Leoniceno, Ruelle, or Mattioli, though he continued to cite them as he framed his own investigations. Clusius acknowledged that he and his Portuguese colleague were, in fact, doing different things. And when he wrote of the changes he had made to Orta’s book noted that “our author [Garcia de Orta] had his reasons” for crafting the *Coloquios* in the way that he did. What those were, Clusius could not have known and did not speculate. But he, like Orta, recognized them just the same. The recent tendency to probe Orta’s work for the roots of modern science only divorces author, text, and context in order to insert them into a teleological narrative of scientific progress. The project of natural history itself was variable, its forms multiple. What was to be studied, how it was to be studied, and how knowledge produced through that study was to be represented were all informed by a confluence of factors.

In the case of language, Orta and Clusius shared a common intellectual ancestry. A thorough grounding in Latin became essential to the study of nature in the West in part because of its deep connection to the learned medicine taught in university faculties—a

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74 Orta, *Coloquios*, 1.
tie that was strengthened beginning in the late fifteenth century as some scholars and physicians sought to reform medical curricula by improving the instructional texts upon which they were based. As the study of nature moved beyond the purview of learned medicine, its community of practitioners grew more diverse, drawing lawyers, theologians, ministers, and professors in other fields, as well as merchants, apothecaries, artisans, printers, and a range of literate craftsmen. The roots of their particular interests in nature were similarly wide-ranging: a concern for medicine, an interest in the exotic, an appreciation of the aesthetics of nature, or an abiding concern with trade and profit. Their contributions to the study of nature were not always accorded equal authority but fluency in Latin granted naturalists from diverse backgrounds access to a community within which the social hierarchies often associated with the life of the mind could be temporarily suspended. A command of Latin thus became an important social and cultural marker, signifying community membership, giving personal letters between members an added patina of intimacy and publications an enhanced veneer of authority. As a language in common, Latin publication made a text available to the widest possible audience of interested potential readers. Hence when Clusius introduced readers to his Latinized version of the *Coloquios* it was, as he claimed, to allow others besides the Portuguese to enjoy the books utility. In other words, it was a service to the wider community of interested naturalists of which he was a part.

Orta had been educated in Latin in the late 1510s and early 1520s, just in time to study from the first generation of revised medical books produced by Niccolò Leoniceno and his students in Ferrara. But in Portugal’s empire, accounts of the natural world,

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explanations of advanced navigational technology, and discussions of the peoples and commodities that belonged to the wider world were most often written and published in the vernacular rather than Latin. Even as the House of Avis encouraged intellectual and artistic ties between Lisbon, Antwerp, and Rome, the use of Latin often met with impassioned resistance and even satire. Use of the vernacular posed little threat to Orta’s credibility. Rather, it enhanced it; for in Goa and throughout the empire, Orta’s discursive community was one in which university-trained physicians numbered few among the preponderance of apothecaries, merchants, traders, officials and—especially in Brazil—estate owners. Those two factors—the limited embrace of Latin as the language of learned discourse and a colonial intellectual community far more conversant in Portuguese than Latin—made the vernacular an asset.

The organizational strategies chosen by Orta and Clusius were meant to address the specific concerns of their respective communities. Particularly for Clusius this meant highlighting what was new from the world overseas—no matter which of the Indies it had originated in. Hence there was nothing at all incongruous about grouping flora from South Asia together with the plants of South America. Such a concern with the new was a product of two influences. The largely Iberian ventures in Africa, Asia, or the

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80 Language, exploration, and Portuguese identity were bound up together from the beginning of the Atlantic ventures. Bernardo Vasconcelos e Sousa, “Medieval Portuguese Royal Chronicles. Topics in a Discourse of Identity and Power,” e-Journal of Portuguese History 5 (2007): 1-7. Latin, so characteristic of humanism elsewhere in Europe, had a checkered history in Portugal. In 1540, in addition to his Décadas da Ásia, João de Barros published a Dialogue in esteem of our language (Diálogo em louvor da nossa linguagem). And despite the training he received in classics at Coimbra in the late 1530s, novelist Jorge Ferreira de Vasconcellos used his fiction not only to highlight Portugal’s maritime exploits and champion imperial expansion, but also to uphold the Portuguese language as a valuable medium of literary expression—in one of his novels going so far as to mock a pedantic Coimbra student who insisted on the use of Latin even in love-making! Damião de Góis was all but condemned to death by the Inquisition late in life for his close association with Erasmus. Anson C. Piper, “Jorge Ferreira de Vasconcellos: Defender of the Portuguese Vernacular,” Hispania 37 (1954): 400-405; Bell, “Damião de Góis.”
Americas—from which they were largely excluded—generated an interest in the novelty of the overseas world.\textsuperscript{81} And at the same time, the impulse of medical humanism had driven many naturalists into their own hinterlands of Basel or Bordeaux in search of the plants of antiquity. What they found was a natural world whose flora looked nothing like the descriptions left by Dioscorides, who—after all—worked in the Mediterranean basin, never north of the Alps or the Pyrenees.\textsuperscript{82}

Orta had precious little patience for novelty. The health of a colony and his credibility as a physician and naturalist were on the line. Intentionally conflating the things of Asia with those America would have been unthinkable. Instead, he crafted his book so that it spoke directly to the concerns of a community whose interest in the natural world could be charted along the twin axes of commerce and practical medicine. He framed it in these terms at the beginning of the first chapter, precisely where it could not be overlooked. When he introduced his fictional interlocutor Ruano, Orta cast him as Spanish physician with a “great desire” to know all he could about “medicinal drugs” of Asia, but who had come to Goa as a trader, rather than a physician: Ruano owned a share of the cargo of the ship on which he sailed and was in Goa as a representative of the interests of his brother-in-law, who had financed Ruano’s voyage.

If the book were going to be of use to learned physicians, apothecaries, merchants and traders, and to Goa’s Lusophone householders more generally—that is, if it were going to serve the needs of the widest possible range of interests for Portuguese caught in the throes of expansion—Orta had to be careful not to tailor his book too neatly to any single group. If he had wanted to emphasize the causes of disease, he might have

\textsuperscript{82} Ogilvie, \textit{Science of Describing}, 133-137.
organized the *Coloquios* around various illnesses that the Portuguese confronted. He could have loaded key chapters with extensive and rather precise elaborations on the humoral character of each plant and filled its pages with ruminations about the bodily effects of the pronounced seasonal changes in local climate. But he did not. Had he wanted the text to be of greatest value to apothecaries and of service to the Crown he might have followed the examples of Pires or Alvares and focused solely on the provenance of the drugs and spices in question. A similar method detailing the plants and other medicinal commodities available in various markets would have served merchants and traders well; this was precisely the format observed in many of the Portuguese travel accounts that detailed the ports of Indian Ocean Asia.  

Orta, however, chose the organizational device that reflected the single most common concern to each of these groups: plants. Chapters organized alphabetically according to the common, vernacular name for each plant in question not only adhered to the longstanding herbal tradition associated with Dioscorides, it also made the *Coloquios* an imminently flexible guide to Asian *naturalia*. This was not a book meant to draw attention to the little-known flora of Asia. Things like lychees, neem, and *negundo*—unknown to Western readers—were spread out, isolated, and buried amid other all-too-familiar and lucrative commodities like pepper, cinnamon, and cloves. No, the *Coloquios* was more like a field manual: published as a quarto, it could be packed and carried with ease. That so few of the two hundred and fifty original Portuguese copies have survived—and that they lived on only in European libraries—may well be a testament to the book’s success. For printed material, the soiled hands of the physician, the incessant

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83 Barbosa, *Livro de Duarte Barbosa*; Bocarro, *Livro das plantas.*
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In the decades leading up to the publication of the *Coloquios*, the act of illustrating books on natural history became a contentious affair. To be sure, it was already a heady endeavor and required a veritable contingent of specialists—from authors, proofers, and paper-makers to wood sculptors, painters, and printers. How images made their way into books was as variable as the reasons for their inclusion. Illustration, moreover, raised a host of questions that were of special concern to naturalists. Plants changed with the seasons. Questions over what, precisely, was to be depicted and how led to a variety of techniques that were honed in the middle and late-sixteenth century. For that brief span of time, images were all the rage in serious publications on natural history. But in the 1530s among Orta’s counterparts in Italy and northern Europe, illustration became the subject of vitriolic debate.

In 1542, one of Clusius’s elder colleagues, the German physician Leonhart Fuchs, published *De historia stirpium*—the *Remarkable Commentary on the History of Plants*. It was a book that brimmed with elaborately detailed woodcuts. Fuchs oversaw their execution with great care and was rather pointed on their importance; he sought to establish an exact relationship between picture and text. The book was an instantiation of Fuchs longstanding contention that the way a plant looked was sufficient to allow the

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careful, disciplined observer to draw definitive distinctions between even very similar specimens: a plant could be identified by its outward appearance. The purpose of his illustrations was to allow his readers to do just that. The printing of *De historia stirpium* marked a decade of heated and even rancorous debate on the matter, with insults exchanged publicly and in print. Pictures, his detractors argued, simply could not be used in the way that Fuchs had argued. Illustrating books had become tendentious indeed.  

When Orta sailed to Goa in 1534 the dispute had only begun. Whether he knew about it or not is an open question. But Orta was able to get a copy of the Fuchs book sent to him in Goa after its 1542 publication and cited it in his own chapters on spikenard and zedoary. The issue that Fuchs had raised with reference to illustration was the same one that lay at the very core of the *Coloquios*: What was the relative importance of physical appearance versus other kinds of somatic encounter in identifying *with certainty* the medicinal plants of antiquity? Orta’s response to that question was his signal achievement in the *Coloquios*. As it turned out, Orta’s was a solution that put him at odds with the humanist thrust of Renaissance medicine as championed by Leoniceno, Fuchs, Mattioli and many others. His decision not to include pictorial representations of plants, however, was not a refutation of the utility of images in the study of flora, but evinced instead Orta’s sense of the impracticability of imagery for a naturalist in Orta’s position. So how, precisely, did Orta manage to identify the plants that sustained the health of wealth of Portugal’s capital in Asia? The remainder of this chapter answers that question.

As Orta saw it, the circuits of exchange that were the very sinews of Portugal’s empire took on special significance in the cataloguing of nature and its uses:

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now that navigation is better known, and that there are more ships, both to Portugal and to other parts of the West, it is not to be wondered that we have so much, and so cheap, without its being falsified. And we buy these medicines better and they are grown better now, because more are cultivated.\textsuperscript{87}

For Orta, in other words, the boon of Portugal’s commercial system was not simply that it allowed cheaper transport and a more stable supply of commoditized nature but that it also increased the volume of things in transit and stabilized their identity once they were part of the imperial stream: “we have so much . . . and without its being falsified”—density and predictability were critical attributes of the imperial system of circulation. As long as the empire could channel to Goa specimens that had not been “falsified” or otherwise manipulated prior to entry, then they may safely have been assumed to be no more and no less than what was claimed of them. In similar fashion, when Orta attached names and qualities to things of nature, the coherence of those associations was secure beyond Goa to the extent that the network that circulated them remained intact.\textsuperscript{88} The identities of plants as Orta set forth in his book and the circulatory streams that brought specimens of plants under Orta’s purview in the first place—and thereby made the book possible—came to serve as guarantors of the veracity of those same identities: the\textit{Coloquios} carried knowledge securely wherever the network could take it and the knowledge it contained remained as reliable as the network in which it was grounded. Orta’s text and the Portuguese imperial streams that served as its context reinforced one another in a tautological loop that enabled both survival and profitable commerce.

So much for Orta was true, at least in theory. The dilemma that he faced time and again was, much to his general frustration, that theory—like whitewash in the face of

\textsuperscript{87} Orta \textit{Coloquios}, 401.

\textsuperscript{88} Here of course, I am referring to the notion of “immutable mobiles” developed by Bruno Latour, \textit{Science in Action}, 223-228.
summer monsoons—withered and cracked under the strain of reality. Problems were manifold. But they all sprang from a common source: Orta occupied a single point within a much broader network of trade and communication. He was one receiver among many in one of numerous locations within the broader system of intra-Asian (and ultimately global) commerce. Well before most specimens of nature were at his disposal, they had been collected, sifted, sorted, selected, rejected and otherwise submitted to regimes of accumulation and order of which most Portuguese—Orta included—had limited knowledge and little or no influence. To Orta these procedures seemed, by turns, arcane or arbitrary.

Such was the case, for example, with the camphor that arrived to the ports of western India from Borneo, Sumatra, and Formosa. Used to treat burns, cure insomnia and—contradictorily—provoke sleepiness, camphor was (and still is) a drug derived from the desiccated gum harvested from thick branches cleaved from one of two species of laurel trees.89 The branches themselves were harvested and shipped but so too, were ready-made specimens of the drug itself. Camphor was bought and sold in an assortment of sizes, appearances, and qualities, the best and most expensive of which were large masses almost entirely white in color. The slim branches themselves could be purchased outright, which is how the apothecaries Orta met in Goa bought it. But it was the process of sorting that perplexed Orta. Upon receiving a shipment of prepared camphor, banyan merchants used copper sieves of varying weaves in order to sort the drug into a four groups based on size. What the banyans themselves labeled their categories, Orta does not say but the Portuguese chose cabeza (head) as the name of the largest of these and pé

89 In the identification of camphor, I have relied on Clements R. Markham, ed. and trans., Colloquies on the Simples and Drugs of India by Garcia da Orta (Lisbon: Henry Sotheran and Company, 1946), 88, n.4
(foot) to refer to the most diminutive—about the size of a grain of rice. The merchants then subdivided each of these into categories based on their qualities, discernible by their color, with white being the best. Many of these—and perhaps the majority—had already circulated and, in transit, sustained the hard knocks and exposure to moisture which gave them a vermilion hue and often streaks and stains of black. These were the middling variety. The worst, what Orta referred to as “refuse,” were all black.  

As things moved about in these transit circuits, and as different human communities selected, collected, prepared, and redistributed specimens according to their own preferences, they created troublesome variations in appearance. By the time camphor arrived to market in Goa or Cambay, where Orta discussed it with the Hindu merchants who had befriended him, camphor the drug bore no resemblance whatsoever to the camphor in its vegetable form—slim branches torn from the trunk of their tree that could also be purchased on the streets and markets of western India. Changes in appearance, as with camphor, were partly a consequence of the manipulations required to transform various components of a plant into medicinal simples. And again, as with camphor, the medicine itself took various forms. But regional variations in the techniques of preservation gave some of the same medicinal simples radically different appearances. Orta noted that the asafetida, that came to Goa from Gujarat was a translucent, brown substance that was hard and brittle; but the same simple arrived from the Arabian port of Hormuz came preserved in “bullock’s blood” and wrapped in a clumpy earthen coating.  

Divergent appearances were also the result of intentional deception. Precisely because the streams of exchange that characterized Portugal’s Asian presence were

90 Orta, Coloquios, 88-92.  
91 Orta, Coloquios, 47.
commercial, information as to the identity or utility of the natural objects they delivered was dubious. Hence, even though an emphasis on particulars and evaluations of worth based on subtle observable distinctions provided common ground upon which merchants, traders, physicians, and apothecaries could meet, the profit-generating practices of the merchant rarely inspired the trust of those intent on establishing certain knowledge of nature. In Orta’s experience, commerce—especially over long distances and across multiple points of exchange—inevitably led to the adulteration and falsification of various specimens of nature. In the Coloquios, Orta rarely missed an opportunity to point this out and regularly commented how merchants were unscrupulous in their commercial dealings.92

Orta simply did not have access to the points of origin for all of the plants that concerned him, nor did the Portuguese often control specimens over the entirety of their journey into his hands. Even if they had, Orta had no reason to believe his countrymen would transport naturalia and information about it any more reliably than any other trading group in Indian Ocean Asia; rather, Orta reproached them for what he saw as their peculiar lack of “curiosity” about the origins and qualities of the things in which they trafficked.93 Adulterated or not, and regardless of who transported it, nature tended to change in transit. Commoditized, it had life cycles of its own—quite apart from that which carried plants from germination to fruit-bearing maturity—as the process of exchange implied an ill-defined but nevertheless inevitable succession of transformations. Hence for Orta the study of nature—the identification of valuable commodities and the description of indispensable medicinal plants—involved a great deal of uncertainty that

92 Orta, Coloquios, 355, 478.
93 Orta, Coloquios, 373, 418, 475.
resulted from the very networks upon which he—and Portugal’s empire—depended. These networks provided for variety far more easily than they could be used to verify claims of veracity. The potential certitude engendered by the density and predictability of an imperial system of exchange was thus always mitigated by its limited reach and by its fundamentally commercial nature.

Because reliability—of the networks, of informants, of the identity and quality of the naturalia themselves—remained a major problem, Orta’s task was to devise an investigative program that might allow him to manage so much uncertainty with a confidence sufficient to produce and verify truth claims about the natural world. Consequently, the experience of nature itself became crucial for rendering an accurate account of the natural world. Orta’s dogged insistence on examining first hand the profusion of naturalia in Goa evinced at once the trader’s concern for the wisdom of a particular investment and the physician’s attention to the identify and efficacy of a given drugs. But an abiding appreciation for experience as an essential component in the making of natural knowledge took shape in response to the uncertainty inherent in the networks that linked Orta to the wider world of Asia.

Precisely what kinds of experience could best secure natural knowledge? On this point, Orta readily deferred to the interpretive framework he learned at university: Orta’s encounters with nature were mediated by the humoral framework, which insisted that every item of nature possessed a set of inherent qualities. In his attempts to certify the identity of natural specimens, he turned first to their touch, taste, and smell. Of these, the first two—taste and touch—were frequently taken as primary and decisive. So when Orta ventured his own conclusions on the question of pepper, it was to their respective tastes
that he turned first: white pepper was “sour” and long pepper “rather bitter” but black pepper was “smoother . . . sharper and more agreeable to the taste” than either of the others.94 On the matter of taste, Orta was most pointed when it came to camphor, confirming its cooling complexion because “touch and taste” dictated so. And when he needed to identify the freshest asafetida he judiciously relied upon his olfactory sense: regardless of its manner of preservation, the best asafetida, be it from Arabia or Gujarat, had a terrible odor and smelled equally bad. Such qualities, he said frankly, were “not likely to deceive.”95

Orta’s long years on the Indian coast compelled him to question axiomatic assumptions about the value of humoral assessments of the complexion of nature’s products. The Portuguese physician’s insistence on the capacity of taste and smell to yield certain knowledge of plants was not unequivocal; he wavered on the ultimate utility of the distinctions they yielded. Classificatory schemes rooted in somatic encounters were flimsy indeed. Taste and smell in particular were deceptive; the impressions they gave were—as it turned out—not universally recognizable attributes. “I smelled the finest melon in the world,” wrote Orta of an encounter with a watermelon. It was an impression confirmed by one of his Konkani servants, who gave her assurance that the melon was indeed “quite good.” But the experience of the fruit disappointed: “when I tried it the taste was like mud.” For Orta the answer was simple: the young woman had spoken “according to her taste.”96 On the matter of taste and smell, the betel leaf was particularly vexing. Goa’s Konkani peasants chewed it together with the areca nut in a mixture that to Orta and many of his Portuguese countrymen found appalling. The leaf, he noted, “has a

94 Orta, Coloquios, 370
95 Orta, Coloquios, 94-97.
96 Orta, Coloquios, 303.
very nice smell to those who use it but to me a very nasty one." And even if the odor of
asafetida was enough to turn Portuguese noses away, the vanias he met in Goa insisted
that the plants from Gujarat were pleasant indeed and on that basis along easily
discernible from all others.

For a science of naturalia that was based on precisely the use of sense experience
to resolve textual ambiguities and to certify both the identity and medicinal qualities of a
plant, the variable and—as Orta suggested—the highly local nature of sensory
evaluations was a thorny issue. As Orta himself pointed out, this disjunction between a
plant’s smell and its inherent qualities was hardly a revelation. A bad odor did not mean
that the plant in question might not taste good or—worse still—that it was harmful if
ingested. The physician took onions as an example: “a very bad smell” they might have
but they still lent to food a flavor that was “rather good.” At stake was not whether the
appeal of a particular part of a particular plant—medicinal or otherwise—might differ
depending on its preparation. The issue was the commensurability of accumulated sense
experiences in general. In his chapter on pepper, Orta noted that even as Avicenna agreed
with Rasis that the spice was warm, the two men were still at odds over whether pepper
was moist or dry. As with other questions, Orta had recourse to nature itself on the
matter; he sided with Avicenna. But that he and his contemporaries in Goa differed so
often in their assessments of plants was symptomatic of a wider problem. “The truth,”
Orta conceded very early in his book, “is that there is a good deal of habit in the matter of

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97 Orta, Coloquios, 48.
98 Orta, Coloquios, 45.
Given his disappointing experience with the watermelon, Orta might easily have added taste as well.

Because taste, touch, and smell failed to provide the certainty they were supposed to, Orta reasserted the value of physical appearances. But because the networks on which he relied tended so often to distort physical appearances, taste touch and smell remained important tools in identifying and describing nature. He drew on as many different somatic descriptors as he could muster in order to distinguish one kind of plant from among all the others. So although the taste of pepper was prominent in his explanation and served as his key differentia, he was quick to add other features that engaged the full spectrum of somatic experience, adding that black pepper—the most valuable of the three—was “more aromatic” and “heavier.” Orta was particularly explicit about how pepper looked:

The tree of [black] pepper is planted at the foot of another tree, generally at the foot of a palm . . . It has a small root and grows as its supporting tree grows, climbing around and embracing it. The leaves are neither many or very large, are smaller than those of an orange leaf, green, sharply pointed, [and here again referencing taste] burn a little like the betel leaf. [The pepper itself] grows in bunches like grapes and only differs in the pepper being smaller in the grains, and the bunches being smaller, and always green at the time that the pepper dries.

No single kind of experience was sufficient to bear the full burden of proof in the study of nature. So Orta mustered as many as he saw fit. It gave his chapters a distinctly uneven and slightly disorganized quality since certain criteria became more valuable in the identification of some plants and was left out for others. But it proved a workable technique in the management of uncertainty inherent in the exchange networks to which he had best access.

99 Orta, Coloquios, 45-46, 48.
100 Orta, Coloquios, 369.
It was within this context that Orta used the term “experiment” (in archaic Portuguese, _esprimentar_). And “experiment” as Orta used it had a fairly wide array of meanings. It could connote experience, as in “to try,” and this was principally how Orta used it. But he also employed the term to refer to chemical and mechanical manipulations of various objects of nature, as when he distilled waters of various plants. And occasionally he used it to suggest that he had or had not tried a particular remedy on a patient. For Orta, “experiment” _could_ mean any of these things. It _could not_, however, be taken to imply that Orta had created a systematic experimental program. For there is no evidence either in the _Coloquios_ or in any of the few documents left behind that suggest that Orta was engaged in the systematic production of probabilistic “matters of fact” through the application of technology to nature.\(^{101}\)

If “experiment” referred no more and no less than to a first-hand somatic encounter, it was—by itself—only half of Orta’s epistemological toolkit. It was important but so too was textual citation. Alone, neither was sufficient for the production of certainty. But together they offered a legitimate basis for a correct accounting of nature. It was in marrying text with experience (rather than experiment) toward the production of certainty (rather than probability) that Orta understood the concept of “experiment” and ultimately sought to certify natural knowledge.\(^{102}\) And his citation strategies, like his use of personal experience, were shaped by the Indian Ocean context.

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\(^{102}\) My argument for epistemological conservatism is similar to that of Paula Findlen, _Possessing Nature: Museums, Collecting, and Scientific Culture in Early Modern Italy_ (Berkeley: University of California Press, 1994), 57-70, 198-208.
Wherever possible, Orta framed the discussion of each plant by referencing the opinions of ancient and contemporary writers, drawing heavily on the scholars and physicians whose work was published in the years leading up to his 1534 departure from Lisbon. Contacts stretching from Iberia and northern Italy permitted him access to several important works—that Valerius Cordus, Leonhart Fuchs, and Pietro Mattioli—printed later. But who Orta cited was primarily governed by two conditions: his unparalleled access to the drugs that had been the concern of Greek and Arab physicians for centuries, and the prominence of Arab merchants and the pervasive use of Arabic as the language of trade throughout Indian Ocean Asia. As a consequence, Orta relied heavily on the work of Dioscorides and commentaries on his De materia medica. But he found the work of Arab scholars, and especially of Avicenna, to be equally indispensable. Rather than refer to translations and commentaries of Dioscorides to correct the knowledge of Avicenna and other Arab writers, Orta did the reverse. He found that Arab authors and their terms were far more reliable guides to nature in the Indian Ocean. In this, a full and true accounting of nature—and access to its curative potential—required some of the very language that leading scholars, naturalists, and physicians such Nicolo Leoniceno, Leonhart Fuchs or Pietro Mattioli sought to eliminate. The Portuguese physician was certainly sympathetic to the criticisms of Leoniceno, Fuchs, or Mattioli of the sloppy transcription and editing of earlier generations. But he was impatient with careless accusations. To Leoniceno, who viewed Arab authors and Avicenna in particular as a “cruel tyrant” followed by slavish devotees, Orta retorted that Leoniceno and “so many other modern writers” were wrong to “say so many vile things of the Arabs, for the faults

103 Most recent was the 1561 travel account across Mediterranean. See the very useful index of Orta’s citations in Markham, Colloquies.
104 See for example his discussion of myrobalan in, Orta, Coloquios, 314-320.
are their own [and not of the Arab physicians].” Orta insisted, “the Arabs deserve our praise.” For Orta, medieval Arab texts were indispensable in ways that medical humanists like Leoniceno and his students (including Fuchs) had failed to recognized. He knew this because what his Italian and north-European counterparts lacked—wide-ranging access to the flora and fauna of Asia—Orta possessed in abundance.

Orta’s was a science crafted in situ, dependent upon cross-cultural collaborations and underwritten by networks of a distinctly commercial orientation in which the language of exchange was more often Arabic or one of a number of South Asian languages than Portuguese. These qualities—the inherently commercial character of exchange, dependence upon cross-cultural collaborations, and the pervasive use of languages other than Portuguese—exercised a profound influence on Orta and his work. His sense of the utility of images in the presentation of natural knowledge, the authority he attached to different kinds of somatic experience in the production of that knowledge, his understanding of the place of ‘experience’ and his definition of ‘experiment’ as epistemological tools, and even Orta’s citation strategies were all variously shaped by these circumstances.

In this setting, illustrations in a book on nature meant to provide certain knowledge made little sense. Upon receipt of a particular natural object, Orta had good cause to ask what, precisely, he might be supposed to depict. Illustrations could convey with utmost precision the appearance of objects. But such representational value as they carried for Clusius and north European naturalists was underwritten by a particular kind

105 For Leoniceno on Avicenna see Ogilvie, Science of Describing, 131. For Orta on Leoniceno, see the Coloquios, 113-114.
of network. They were effective, if still controversial, for Clusius and his circle because they often had constant possession of the artifacts they intended to portray. Certainty about the physical aspects of *naturalia* was more difficult when it had been subjected to an unknown series of manipulations. In this environment, illustrations were of questionable utility, expensive, and Orta had little cause to concern himself with them.\(^{106}\)

An illustrated natural history of the region’s flora did, however, come to print—but only later, at the beginning of the next century. It was created by an unknown Indo-Portuguese trader in the northwest corner of the Bay of Bengal, where the formal edifice of the *Estado* had never been established. It was made possible, in other words, not by the extension of Portugal’s empire outwards, but by someone living and traveling as part of the intra-Asian exchange network. In that way the author, whoever it was, gained access to local flora before they entered the circuits of exchange that led to their manipulation.\(^{107}\)

\(^{106}\) Even among Clusius’s circle and when relatively numerous individuals in multiple audiences could testify as to a thing’s appearance, the edifice of testimony itself could provide a poor guide for artists and sculptors. Albrecht Dürer’s famous depiction of the rhinoceros, while remarkably precise in detail still errs on numerous points. For a brief account of its making see the “Introduction: Commerce and the Representation of Nature in Art and Science,” in Smith and Findlen, eds., *Merchants and Marvels*, and compare the illustrations in Debus, *Man and Nature in the Renaissance*, 40.

Credibility Gap
Facts and Fictions of a Colonial Science

I want no censure from a friar lest it come from the pulpit.

—Garcia de Orta (Goa, 10 April 1563)

Those with fruit, those without fruit,
Those flowerless and those with flowers,
Impelled by the Lord of Magic Spells
May they deliver us from ill.

—From a Vedic hymn in praise of medicinal plants (Rig Veda, ca. 1500 BCE)

I

It was late in the summer of 1589 and the wind and rain of the summer monsoons had begun their annual assault on Goa, bringing with them the familiar depredations of this most uncertain of seasons. Throngs of idle soldiers and seamen waited out the storms for their next assignment. The city’s main quarters had become damp and crowded. Many of Goa’s streets were flooded. Hospitals filled. And the specter of disease loomed over the city, enhanced no doubt by recollections of the cholera epidemic that had swept the island a year earlier. The fleet due in from Lisbon had by this time left Mozambique, pulled by

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1 Orta, Coloquios, 258
3 Alberto C. Germano da Silva Correia, La Vieille-Goa (Bastorá: Tipografia Rangel, 1931), 268-307, lists the years of several outbreaks including this one.
the monsoon eastward across Indian Ocean, though when it might arrive—and in what condition—no one could know. Anxiety ran high. And it was “principally at this time, awaiting the ships from the kingdom,” wrote the Inquisitor Rui Sodrinho and Fray Thomas Pinto to Philip I, that “depravity and corruption” (deuassidão e rotura) too were at their height in Goa. Manuel de Sousa Coutinho and Dona Ana Espanholim—the governor of all of Portuguese Asia and his wife—had abandoned the sanctity of the island’s Catholic Church for the pagan succor of a Hindu shrine on the mainland, where they “dealt in the mysticism of witchdoctors” (feitçois), asking—as it turned out—for some measure of help or guidance or assurance in the midst of that they feared was an impending disaster.⁴ Sometime later, in the subdued calm of Goa’s São Domingos monastery, Dona Ana confessed to Fray Thomas that she and her husband had wanted “to foresee the things to come” by interpreting “dreams” and to consult with the sorcerer, that he might “cast spells.” Stern and unforgiving, the Inquisitor Sodrinho had little tolerance for transgression—even when the life and livelihood of Portugal’s Asian capital were at stake.⁵ In punishment, the governor’s wife was levied a severe fine. But it was decided that Coutinho himself should plead for mercy in trial before the Inquisition. The Holy Office, however, along with other members of the clergy, had earned enemies among some of the city’s most powerful casados. Since trying a fidalgo could only inflame tensions, the trial would take place not in Goa but Lisbon. And so it was that one of the most powerful Portuguese officials in Asia sailed from Goa in shame.⁶

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⁴ António Baião, ed., A Inquisição de Goa: Correspondência dos inquisidores da Índia (Coimbra: Imprensa da Universidade, 1930), 2: 127. The letter was written by Rui Sodrinho and Fr. Thomaz Pinto from Goa, dated 20 of November 1589.


⁶ Baião, Inquisição, 127.
Medicine was underwritten by assumptions about the relationship between nature and the human body, including conceptions of the occult forces of life and death, and was closely intertwined with religion. In Goa, where survival so often hinged on the curative intervention of Hindu physicians—vaidyas (specialists in ayurveda)—the practice of medicine was always pregnant with subversion. Secular and religious officials alike took an immediate interest in the activities of the colony’s Hindu physicians. They distinguished Brahman priests—the feitiçeiros of the governor and his wife—from the vaidyas who focused on bodily illness. But such distinctions were never drawn very sharply. Hindu priests and physicians alike seemed to represent a threat to the moral integrity of the Portuguese Catholic enclave. Beginning in the 1540s, as efforts to curtail the primacy of Hindu physicians in Goa strengthened, the grounds upon which their prominence was contested were both religious and more broadly ethnic. At stake were both the orthodoxy of its Catholicism and its Portuguese identity—one defined in terms that were not only religious but included personal networks of association, language, dress, food, and medicine. Vaidyas readily contested any assault on their clinical primacy in Goa. But Portuguese officials never represented a united and sustained front anyway.

Note that I do not discuss yunani (unani) medicine, a form of humoral medicine developed through Arab physicians in the subcontinent, because the Portuguese were much less tolerant of them in Goa. Orta probably did not meet them in the field but not in Goa. For a contemporary account of Islamic medicine see Pedro Teixera, Relaciones del origen, descendencia y sucesion de los reyes de Persia, y de Hormuz, y de un viaje hecho por el mismo autor desde la India Oriental hasta Italia por tierra (Amberes: n.p., 1660 [1610]), 175-182. But a parallel discussion can be found in Basham, “Medicine in Ancient and Medieval India,” 39-40; and S. H[asan]. Askari, “Medicine and Hospitals in Muslim India,” The Journal of the Bihar Research Society 43 (1957): 7-21.

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And countless members of the Portuguese settlement continued to prefer *vaidyas* to their countrymen or coreligionists.

At the beginning of the seventeenth century, the most prominent members of Portuguese Goa sought increasingly to curtail the influence of the city’s *vaidyas*. By then, the contest over medicine had become entwined in a power struggle among disparate colonial interests—a contest which pit the powerful Society of Jesus against members of Goa’s municipal council (*senado da câmara*) and the *Santa Casa da Misericórida* confraternity (membership and familial affiliation in these two bodies often overlapped).8 Hence the practice of medicine in Portuguese Goa traversed fault lines that were at once religious, ethnic, and political. Between 1510 and the early seventeenth century, all of Portuguese Goa was caught at the convergence of the simultaneous and contradictory processes which took shape as imperial ambitions met with the exigencies of settlement: the need to embrace the medicine of *vaidyas* and the imperative of constraining their influence. Long before Garcia de Orta filled his inkwell or organized his notes, the difference between traversing and transgressing had become fluid and uncertain.

*Vaidyas* were prominent members of Goan society before the Portuguese arrived in 1510 and kept a flourishing practice in the city for decades thereafter. Their presence was embraced; their medical opinions were taken as authoritative. When in the midst of the cholera epidemic of 1543 governor Sousa took the last desperate measure of ordering an autopsy on one of the corpses of the recently deceased, he insisted that, “*all men learned in the art of healing are asked to attend.*”9 So lucrative was the business of medicine and so prosperous were Goa’s Hindu physicians that they could afford to move

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along the streets in the high style characteristic of Portuguese colonial aristocracy—on horseback or in a palanquin, armed with saber and accompanied by a small retinue. By the middle of the sixteenth century, *vaidyas* had become the preferred healers of some of Portuguese Goa’s most powerful secular and ecclesiastical officials.\(^{10}\) In the fall of 1589, Coutinho had done no more than subscribe to what was by then a longstanding convention.

Precisely when *vaidyas* became inextricable members of Portuguese medical communities in Asia is difficult to pin down. Two of the earliest discussions of Portuguese medical affairs in Asia offer contradictory perspectives. One came at the end of Tomé Pires’s 1516 list to Dom Manuel—in that bit of unsolicited pecuniary advice tucked gently—almost unnoticeably—into Pires’s brief postscript. There the apothecary insisted that the only things in the way of medicine that need come from Lisbon were “turpentine, ceruse (*sic*), aloes. . . a little scammony, olive oil, [and] mastic,” for they were otherwise expensive and hard to find. “All [else] can be settled here . . . [and] with the things that exist here” and compound medicines in particular “can be dispensed . . . [by] the apothecaries, surgeons, and physicians [spread across Portuguese Asia], for they are paid for that.”\(^{11}\) Pires’s sense of Portuguese medical affairs in Asia was clear enough: much Asian *materia medica* was not only familiar but fresh, abundant, and readily available and Portuguese specialists were sufficient in number to handle the needs of the *Estado*. But when in 1516, Pires wrote all this down, the extent of his Asian travel was limited to a pair of brief layovers in Cochin and a three-year term in Malacca. Given the extensive seaborne travel already undertaken by many of this countrymen—men like the


\(^{11}\) ANTT CC Parte I, mç. 19, n. 102, f. 4v.
pilot Rodrigues—the opinion, though earnest, seems to have been based on little more than his own unusually narrow experience.

For Afonso de Albuquerque—among the few Portuguese officials in Asia at the time with a tie to the court of Dom Manuel that was more direct that Pires’s own—the view was altogether different. Having traipsed militantly from Hormuz to Malacca and back again, Albuquerque thought the Estado was much too thinly spread. He had begun to take account both of the precise range of ailments that threatened to undermine his work and the kinds of treatments that that might mitigate Portuguese losses. “There are physicians [spread along the Malabar Coast], he explained to Dom Manuel, “who cure in this way”:

To those who are weak with fever, they give them meat to eat, and fish, and give them purgatives of fig seeds (figueira de inferno), or leaves, finely crushed, in a drink. If they suffer from dysentery (camaras) they are given fresh coconut water . . . If the suffer from nausea (arrebeça) their heads are washed with cold water to stop the vomiting. To those who are injured, they lance [the wound] with hot oil every day, thrice a day. For prolonged illnesses, the remedy . . . is a sojourn to their temples.

For Albuquerque, Indian vaidyas and their curative techniques were not only effective, they buttressed imperial designs. That he could detail specific treatments suggests that before he succumbed to fever in the fall of 1515, vaidyas had already become de facto members of Portuguese Goa’s diversifying medical community—one in which the Portuguese apothecaries, surgeons, and physicians to which Pires referred perhaps only

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14 On Albuquerque as an agent of centralized power under the Crown and the architect of Portuguese India see Subrahmanyam, *Portuguese Empire in Asia*, 67-69.
months later (Albuquerque’s letter is undated) were already numerically and intellectually minor contributors.

The relative scarcity of Portuguese physicians was perhaps the most oft-cited justification for the embrace of Hindu physicians in Portuguese Goa. That, at least, was how Goa’s viceroy and members of its municipal council (senado da câmara) presented their case to the Crown in intermittent requests for metropolitan physicians. And indeed, that too few metropolitan physicians were available to supply the growing needs of not only an expanding Christian community in Goa but throughout Portugal’s empire is plain enough: the explanation was repeated with such consistency and accords so well with available information on the state of medicine in Portugal and throughout the empire that these claims were almost certainly grounded in fact—there were too few Portuguese physicians in the Estado to treat even the entire Christian community in Goa.15 On its own, need might explain why Portuguese settlers turned to vaidyas in particular moments of severe distress. But it accounted for neither the credibility they were afforded by the Portuguese nor the authority they wielded in Goa.16

Some Portuguese considered the work of Goa’s vaidyas superior to their own because they were most familiar with locally available materia medica,17 though Pires

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15 I do the numbers in Appendix A. Estimates of the number of physicians that the Crown and his advisors deemed necessary can be taken from Panduronga S. S. Pissurlencar, Regimentos das Fortalezas da Índia: Estudo e Notas (Bastorá: Tipografia Rangel, 1951), which outlines the allocation of funds for each outpost, including the fees of apothecaries, physicians, and surgeons, and the cost of upkeep for hospitals.


17 Linschoten, Voyages, 1: 236; and Academia Real das Sciencias, “Breve relação das escrituras dos gentios da India Oriental e dos seus costumes,” in Collecção de Noticias para a Historia e Geografia das Nações Ultramarinas, que vivem nos dominios portuguezes, ou lhes são vizinhas (Lisbon: Typografia da Academia, 1812), 52-53.
seemed to indicate that familiar medicinal flora was plentifully abundant. Some observers argued from the other side: it was not the medicines that were different so much as the illnesses of the region.\textsuperscript{18} In the words of Duarte Barbosa, the “the land is ill.”\textsuperscript{19} In short, local illnesses were understood to be different from those of Iberia and therefore local healers could best treat them. In a variant of both points of view, some Portuguese suggested that the most effective remedies for the ailments of any place were the plants that grew there and therefore local healers were the appropriate choice.\textsuperscript{20} Contemporaries, in short, grounded their claims in one of three arguments: either Asian diseases were different or local plants worked best or both; \textit{vaidyas} were believed to know more about disease or more about medicine or both. In any case, their knowledge was—in Goa at least—widely regarded as superior, their conclusions decisive.

Requests to the Crown for Portuguese physicians came from Goa only in the wake of the intensified religious conflicts of the 1540s, by which time the widespread and pervasive reliance on \textit{vaidyas} had begun to suggest to the growing contingent of missionaries and Church leaders the strength of an alternative cosmology and the allure of an alternate faith. Church attacks on the cultural edifice of Hinduism extended to the practice of medicine, opening the question not of the credibility of \textit{vaidyas’} medical opinions or methods but about their authority—whether and to what extent they should be authorized to pronounce definitively on matters of health pertaining to the Christian community. As religious tensions in Goa began to deepen, reliance on \textit{vaidyas} became an

\textsuperscript{19} Barbosa, \textit{Livro}, 1: 144. Italics added for emphasis.
\textsuperscript{20} Correia, \textit{Lendas}, 3: 288; Surendranath Sen, ed., \textit{Indian Travels of Thevenot and Careri: Being the Third Part of the Travels of M. de Thevenot into the Levant and the Third Part of a Voyage Round the World by Dr. John Francis Gemelli Careri} (New Delhi, 1949), 162.
increasingly contentious and divisive aspect of colonial life. Under intensified scrutiny, the moral economy that bound physicians and patients broke down. As trust dissolved, feelings of vulnerability and suspicion took root.\(^{21}\) The expulsion of Konkani villagers and attempts to extirpate Hindu rituals began in the early 1540s. They were bolstered on June 10, 1568, with the proclamation of a new set of strictures decided on earlier that year at the meeting of the First Provincial Council. Among the measures announced by Goa’s archbishop Jorge Themudo and printed by Johan Endem (who had only just printed Orta’s *Coloquios* the year before) was a proscription of any medical treatment performed by non-Christian physicians on Christian patients.\(^{22}\) The effort was an utter failure and *vaidyas* remained integral to the practice of colonial medicine. But it was an opening salvo in a lasting contest over the practice of medicine in Goa.

The Church in Goa placed a great deal of stress on outward appearances—public displays of emotion and devotion rather than strict adherence to orthodoxy. The measure of 1568 was part of a wider set of proscriptions focused on associations and symbols of belonging—ritual, as well as dress, food, and other signifiers of personal association. Non-converts were to be separated from converts, whether at markets or in residential

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\(^{21}\) A shared religion could and at times did foster a willingness to trust in the curative techniques of unfamiliar peoples. No other Portuguese account of unfamiliar medicine that I have examined from the sixteenth century gives as detailed and comprehensive account as that of Barbosa, *Livro*, 92-100, when he described the medicine of the Coptic Christians of Ethiopia. That his observations might have been made under the impression that these were the methods of the peoples of the fabled Prester John, would only underscore the point. Medical diagnosis might also have hewn to the parameters of trust. The failure of the Barreto-Homen expeditions up the Zambezi in the 1580s were attributed to fever until relations with their erstwhile native allies began to sour. Retrospective assessments of the expeditions and their collapse were in the seventeenth century pinned on those same allies, who were accused of having poisoned local water sources. These were widely separated and distinct from Goa. Indeed here they present no more than circumstantial evidence but are the subject of pending project.

quarters of the city; Christians were not to patronize Hindu doctors, midwives, barbers, and artisans or other craftsmen; and the death of the father was declared sufficient cause for forcing Hindu mothers to surrender their children to Christian families. It was only following Xavier’s example that Jesuit missionaries themselves donned locally made cotton garments instead of the black wool robes they had brought with them.23

Clerical concern for medicine extended to the visibility of Hindu physicians. Sensitivity to the symbolic meaning of a pervasive and authoritative non-Christian medical presence had a firm precedent. Only Portuguese physicians had ever been allowed to practice medicine in Goa’s prestigious royal hospital. They may have been expert but they were not to bear the imprimatur of an endorsement by the Catholic monarch. In 1572, at the urging of Goa’s municipal council, then viceroy Barreto banned the use of palanquins and horses by vaidyas.24 Barreto’s own personal physician, however—himself a vaidya—was exempt from these measures.25 And even if support for them among Goa’s most prosperous and influential residents was sufficient to have the measure enacted, it was not enough to sustain the new law’s enforcement. The divided opinions and limited achievements of Goa’s councilors on this front only reflected wider opinion. Vaidyas remained credible, integral and, for many Christians in Goa, still authoritative on medical matters. As Linschoten observed during his stay in Goa between 1583 and 1589,

There are in Goa many Heathen phisitions which observe their gravities with hats carried over them for the sunne, like the Portingales, which no other heathens doe, but onely Ambassadors, or some rich Marchants. These Heathen phisitions doe not onely cure their own nations and countriemen but the Portingales also, for the Viceroy himselfe, the

Archbishop, and all the Monkes and Friers doe put more trust in them then in their own countrimen, whereby they get great store of money, and are much honoured and esteemed.²⁶

Sumptuary laws aimed at physicians were reenacted again several decades later but with similar results.²⁷

Just as aggressive efforts either to obscure or preclude the reliance of Portuguese Christians on Hindu physicians proved unsuccessful, any consensus among Portuguese religious and secular officials over how best to manage health in Goa remained elusive. The Jesuits, who were particular proponents of these efforts (it was after all Francis Xavier who began to champion the installation of the Inquisition in Goa almost immediately after his arrival), adopted a strategy of assimilation. If Hindu physicians were too knowledgeable to be displaced outright, Jesuit missionaries would learn what they new. The Spanish traveler Pedro Teixeira observed during his visit to Goa at the end of the sixteenth century that “in India there are doctors which are called pandytos that are learned and good philosophers and I saw them on many occasions dispute with our theologians and doctors of the things of nature and they give a good account of it.”²⁸ Such theatre was often an element in Jesuit conversion strategies but it was risky to be sure: the better the “account” that vaidya’s could give of nature, the weaker the Jesuit argument for their own.²⁹ Hindu physicians held their ground and refused either to abandon their faith or to explain their medicine.

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²⁶ Linschoten, Voyages, I: 230.
²⁸ Teixera, Relaciones, 172.
Many of these exchanges unfolded behind closed doors, in the Jesuit *Colegio de São Paulo*, where the Order asked *vaidyas*—in all likelihood out of necessity—to work and to converse more privately on matters of faith and medicine. The superior of the Jesuit college, one Father Lancillotto, wrote to his colleagues in Lisbon in 1548 that

> We have a doctor that cures here in our house, a Brahman, . . .and when the Fathers dispute with him for an hour or more he is so pertinacious (*emperado*) that he refuses to believe anything. Many times I have wished that Father Antonio Gomez were here to see him and question him for he [the Brahman] is so terrible that, when the Fathers begin to have the upper hand, he becomes malicious, very malicious, and there is nothing in him but the worst poison.\(^{30}\)

Antonio Gomez, the man that Lancillotto wished were on hand to observe these exchanges, was himself a zealous defender of the faith. Gomez held an advanced degree in theology and was named by Xavier as rector of the Jesuit college in Goa, where his curricular reforms included the expulsion of native seminarians and the institution’s eventual transformation into a school for students of Portuguese parentage. He was removed from his post in 1552, after barely four years in Goa, amid a reprimand from the city’s bishop, and in the face of popular backlash.\(^{31}\) The contest for medical primacy that would find expression later in both Church policy and a series of ambiguous secular measures was part of the curative landscape from at least the 1540s.

For Jesuits in particular, this was a kind of medical reconnaissance. And it took on particular significance in Portugal’s colonies, where medicine was at the heart of their work.\(^{32}\) After mid-century, they assumed responsibility for the Goa’s *Hospital Real do* [30] Wicki, *Documenta Indica*, 1: 254. [31] Gonçalves, *História*, 3: 446. [32] On Mozambique Island, in Bahia, and in the Brazilian Amazon, the Society focused heavily on the treatment of illness. On Brazil, see the first part of chapter 4 here. For Mozambique, letters between the Portuguese king and Jesuit leaders in Goa reveal lengthy seventeenth-century exchange over when, after much hesitation, the society might finally fulfill
Espírito Santo—then the largest and best financed medical facility in the city. Its patients were wealthy casados, influential travelers, and soldiers in the service of the king. In addition to the royal hospital, the Jesuits also ran three other hospitals and clinics in the area, which placed them among the single largest providers of medical care in and around Goa. And yet, at the same time, periodic outbreaks of disease forced them to abandon even their own college. So when in 1567 they abandoned what was at the time a newly renovated Colegio de São Paulo, they left under the cover of night to disguise their departure and hide the fact that the new edifice lay vacant, essentially quarantined. If medicine was a cornerstone of their activities, then the prevalence of disease posed a major threat to the viability of the project and to the prestige of the order. The success of the Jesuit enterprise in Goa hinged in part on their success as healers.

Once the Society took over the administration of the royal hospital, the same concern for the credibility of its medical practice drove its policies toward the acquisition of materia medica. They began to establish their own network for securing and circulating Asian material medica—one that was independent of the commercial networks that, as I have already argued, plagued Garcia de Orta’s work. A standard list of medicines and their market prices had been compiled in the hospital a few years earlier in 1552 but the Jesuits revoked it, arguing that it was too complex and confusing. They preferred one that emphasized instead only medicinal plants in their unprepared state.

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33 Sá, Quando o rico se faz pobre, 160.
34 In Muslin controlled Bijapur, their may well have been other facilities that outmatched those of the Jesuits. Askari, “Medicine and Hospitals in Muslim India,” 7-21.
35 Sousa, Oriente Conquistado, 216-217.
36 Here I have to disagree with Zupanov, “Drugs, Health, Bodies, and Souls,” who has drawn a dichotomy between Orta, who wanted to heal the body, and the Jesuits, who focused on the health of the soul.
(medicinal simples) so that anyone in the hospital might readily combine them as needed.37

As it would in Brazil, the growth of Jesuit wealth and influence earned the Society powerful adversaries. In Goa they had become embroiled in what was by 1618 a protracted and bitter struggle with the Santa Casa da Misericórdia—that elite confraternity of prosperous casados that had once run the royal hospital and continued to perform its traditional role as a charitable institution charged with the care of Goa’s infirm and incarcerated. The Jesuits, so claimed the brothers of the Misericórdia, commanded undue wealth and property, especially given their vows of poverty and missionary orientation. The order was at that time seeking to extend its own charitable work and its land holdings, both of which worked to the detriment of the Misericórdia. The two bodies wrote to João III, who initially favored the secular confraternity but finally decided to allow Jesuit plans to go ahead. Members of the Misericórdia, however often sat on Goa’s municipal council or, if not, had friends and family who did.38 As a result, the contest between charitable organizations—for land, funding, and influence over city’s poor—quickly manifested itself as a municipal ordinance on medical practice.

In the fall of 1618 the municipal council approved a comprehensive set of new measures aimed at regulating the practice of medicine in Goa. The new “policies pertaining to physicians, surgeons, blood-letters, and apothecaries,” made six basic

38 Sá, Quando o rico se faz pobre, 160-168; Charles J. Borges, “Foreign Jesuits and Native Resistance in Goa, 1542-1759,” in Teotonio R. de Souza, ed., Essays in Goan History (New Delhi: Concept Publishing Company, 1989), 69-80. I have cross-referenced the partial membership lists I have so far encountered and although the same names do not appear on these lists, there are several last names in common. See Martins, Historia da Misericordia de Goa, 1: 385-389, and 2: 294-298.
stipulations. “No one,” it established, “regardless of Law (sic), quality, or nation” would be allowed to practice medicine without joint approval of the the físico-mor of Goa and the city’s municipal council. The total number of vaidyas and other non-Christian physicians (“fízicos gentios”—literally “gentile physicians”) would be limited to thirty, following a measure taken by Goa’s clergy some years earlier. The new policy added that when these physicians were making rounds, they would no longer be permitted to travel outside of Goa personally in order to procure medicines but must instead send their apprentices to do so. The council also required blood-letters to post above their doors a notice visible to all passers-by testifying to their medical certification. Apothecaries now had to submit to periodic examinations of their shops and storehouses so that the councilors could verify that the drugs in which they trafficked were not “rotten, old, or falsified.” If some materia medica were found to have lost the “virtue and efficacy to do their work” they were to be destroyed—burned under the supervision of the councilors and the offending apothecary. Apothecaries would be required to sell their medicines in smaller quantities so that patients in need of only small doses could afford to buy them. And finally, apothecaries were prohibited from vending their medicines (simples or otherwise) to non-Christians or slaves of any faith.39

Two patterns took shape over the course of the sixteenth century. Various Portuguese factions had come to share a mutual distrust of native physicians. Despite what were at times pronounced differences among councilors, governors, Jesuits, and Inquisitors, the contest for control over medical practice amounted to a joint attempt to restrict and control the work of non-Portuguese, non-Christian physicians. Because what

was at issue was not the validity of their medicine but rather the authority and influence of the native physicians who practiced it, Portuguese efforts on all sides increasingly sought to acquire—forcibly if necessary—the skill and learning of Goa’s *vaidyas*. At the same time, native physicians remained indelible members of Goa’s medical marketplace and often found employment even with many prominent officials. Attempts to reign in their influence and thereby circumscribe their presence, focused as they were on the appropriation of their knowledge, was but a tacit recognition that native physicians continued not only to wield medical authority but that their medicine remained credible even as Portuguese medicine did not.

II

It was one of the countless contradictions of colonization that the expulsion of Konkani villagers and the removal of their Hindu temples meant, first, that a great many young men and women were kidnapped and brought not only into missionary communities but into Portuguese households throughout the city and, second, that Goa—that bastion of Portuguese Catholicism in Asia, became evermore surrounded by concentric rings of Hindu sites of worship set up just beyond the pale of Portuguese settlement. The density of Hindu communities thickened around it while Hindu servants and slaves populated the anterooms, corridors, and kitchens of its most intimate spaces. Over the course of a day, Konkani servants—men, women, and children—moved back and forth across the
domestic, geographic, and religious frontiers of Portuguese Goa in an ebb and flow of traffic that paralleled the coming and going of boats in Goa’s port.  

In tandem with their incorporation into Portuguese households and simultaneous displacement from Goa’s center, a number of rumors about young Indian women had begun to circulate among the Portuguese. One account told of a man whose longstanding bout with dysentery drove his exasperated wife to murder. Finding her husband’s illness utterly abhorrent, she resolved to poison him, for which task she secretly acquired a small quantity of finely crushed diamonds. Her hope was that, by mixing them with his food, their toxic virtue would slowly drain him of life and put an end to their shared misery. Another tale related the thievery exacted upon one unwed but wealthy Paula de Andrade. Her servant had conspired with a lover to poison Andrade and then to steal as many of the matron’s jewels as the two could carry in their escape to neighboring Bijapur. Similar rumors of the use of poison in high diplomacy and low politics were pervasive in Goa. Jesuits corresponding from the Mughal court in Delhi plotted strategies for mass conversion based on reports that emperor Akbar had been poisoned by one of his sons and would soon die. In Goa, a falling out between Archbishop João de Albuquerque and Vicar General Miguel Vaz was likewise rumored to have been settled

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41 Orta, Coloquios, 197. The diamonds failed to do the trick and the ailing man succumbed to death only a long time later.

42 Orta, Coloquios, 174-178.

43 Sanjay Subrahmanyam, Explorations in Connected History: From the Tagus to the Ganges (New Delhi: Oxford University Press, 2005), 4-5; Sousa, Oriente Conquistado, 53-54; Correia Lendas, 1: 59.
by poison. But the associations between women and poison that were rife in Goa during the middle and late sixteenth century had more immediate sources.

Women in Goa were by all accounts skilled herbalists. Orta reported that local Goan women used hashish (bangue) to seduce Portuguese men. And it was Orta who, in the Coloquios, told of Andrade’s robbery—an anecdote that seemed to indicate that herbal knowledge threatened not only men but the wealth and integrity of the Portuguese community more broadly. Dutch traveler Johan Huyghen van Linschoten later recorded similar stories to the effect that,

“the Indian and Portingall women use much to give unto their husbands [i.e. as an aphrodisiac] and often times when they are disposed to bee merrie with their secret lovers, they give it him, and goe in his presence and performe their leacherie together, and taking their husband by the beard they will call him Cornudo [cuckold], with other such like iestes, the man not knowing any thing thereof, but sitteth with his eyes open, not doing or saying any thing, but laugh and grin like a foole, or a man out of his wits.”

Linschoten also confirmed what Orta had written: “the Hearbe [datura] the slaves use likewise to give [to] their masters and mistresses, [and] thereby . . . robbe them.” It was a measure of their skill that wives, lovers, servants, and slaves could render men helpless without killing them; for both Orta and Linschoten noted that it was a potent drug and had to be administered with great care lest, in Linschoten’s words, it “may bring a man to his ende.” Rumors that percolated into the city from the vast and inaccessible South Asian interior seemed to confirm this image of women—and particularly Hindu women—as crafty and duplicitous temptresses. Duarte Barbosa reported that women at

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44 Correia, Lendas, 2: 188.
45 Orta, Coloquios, 52-58.
46 Linschoten, Voyages, 2: 69.
47 Linschoten, Voyages, 2: 69.
48 Orta, Coloquios, 69.
the court of Vijayanagara—the Hindu kingdom that controlled the southern reaches of the Deccan—poisoned one another out of jealousy and competition for royal favor. The report of the missionary Gonçalo Fernandes Trancoso offered confirmation of these tales.

Such accounts had a powerful influence on perceptions of women in Goa. Few Portuguese, including Orta, who had diplomatic connections and personal relationship with physicians at the courts of Gujarat and Ahmadnagar, knew much beyond unconfirmed reports of the interior. It was that very uncertainty that gave tales of domestic treachery some of their purchase. For the power of these rumors lay precisely in the fact that they could be neither confirmed nor falsified. The worries they evinced, however, were real enough. Fears that Portuguese men might easily fall prey to their prowess reflected the profoundly ambiguous position of women in the domestic life of Goa—one enabled by a contradiction between the idealized gender norms of metropolitan Portugal and the exigencies of Portuguese settlement in Asia.

From the beginning, Konkani women had been integral to the production and reproduction of Portuguese Goan society. No sooner had Afonso de Albuquerque taken the city than he encouraged his men to wed Goan women. Historians have long argued

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49 Barbosa, Livro, 59-91; Correia, Lendas, 3: 243.
50 Gonçalo Fernandes Trancoso, Tratado do Padre Gonçalo Fernandes Trancoso sobre o Hinduismo, edited by José Wicki (Lisbon: Centro de Estudos Históricos Ultramarinos, 1973 [Maduré, 1616]).
51 For the unfolding of cross-cultural encounters in the Deccan between the Portuguese and the peoples of the Vijayanagara kingdom see Rubiès, Travel and Ethnology in the Renaissance, 164-200.
over the reasons for that decision and explanations range from the Luso-tropicalist myth of a uniquely syncretic Portuguese character to others rooted in more prosaic concerns for inheritance and commercial contacts. But the policy did lead to widespread intermarriage, forging commercial bonds grounded in those of the family. Frequently enough—and paradoxically—intermarriage would draw many would-be settlers away from Goa and beyond the sphere of Portuguese rule altogether, forging the very Indo-Portuguese families who would later compete with those of Goa’s casados and of the Portuguese Crown itself, most notably in the Bay of Bengal. Here was one ineluctable tension that came with intermarriage: it could both facilitate and dissolve the creation of a stable colony in Goa.

The rhythms of daily life for what were at midcentury the approximately four thousand Portuguese householders in Goa depended upon women drawn from Goa’s indigenous, Hindu communities—and not only as wives, servants, and slaves. Konkani and increasingly mestiço women—as well as others from as far afield as Java—were also nurses, midwives, and healers of first resort. Their skill in wielding the medicinal power of Asian flora—and, to be clear, that was what underwrote rumors of poison and seduction alike—was common knowledge. That, at least, was the impression left on Jean-Baptiste Tavernier, who traveled extensively not only along the Malabar Coast but across much of the Deccan in the 1640s. “As for the commonalty,” he later wrote:

When the rains have fallen and it is the season for collecting plants, mothers of families may be seen going in the mornings from the towns

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54 Subrahmanyam, Improvising Empire.
55 Accordig to Agostinho de Santa Maria, História da fundação do Real Convento de Santa Monica (Lisbon: Antonio Pedrozo Galram, 1699), book II, ch. 1, Javanese dais (specialists in a form of midwifery) had long been employed in this Carmelite convent in the heart of Goa.
and villages to collect the simples[,] which they know to be specifics for domestic diseases.\textsuperscript{56}

Such knowledge of nature gave women access to many of Portuguese Goa’s men, women, and children when they were ill, dying, or giving birth\textsuperscript{57}—when, in other words, they were at their most vulnerable.

Its tendency to strengthen Portuguese reliance on the medical work of women of Indian extraction seemed to be one of a number of ways that intermarriage threatened to dissolve the ethnic ties that underwrote all that was Portuguese in Goa. A deep reliance on them and the consequent anxiety that percolated throughout Portuguese Goa was only the most intimate instantiation of the wider situation between native healers and Portuguese colonists. And as the strictures on movement, association, and patronage announced by the archbishop in 1578 suggest, prominence of the unconverted in the domestic sphere and throughout Goa helped initiate a broader processes of intercultural exchange and interaction that many religious and secular leaders were at pains to control.

III

It was in part for that reason that, among many Portuguese in Goa, Asia medicinal plants were often loaded with significance that went far beyond their curative value. One such item of nature was the diminutive betel leaf. By 1516, the widespread and pervasive use of betel leaves not only in the Malabar region but throughout Southeast Asia\textsuperscript{58} had

\begin{footnotesize}
\begin{itemize}
\item \textsuperscript{56} Jean Baptiste-Tavernier, \textit{Travels in India of Jean Baptiste-Tavernier, Baron of Aubonne}, William Crooke, ed., V. Ball, trans., 2\textsuperscript{nd} edition (London: Oxford University Press, 1925 [facsimile of the 1676 edition]), I: 240.
\item \textsuperscript{57} Santa Maria, \textit{Historia da fundação do Real Convento de Santa Monica}, book II, ch. 1.
\item \textsuperscript{58} Anthony Reid, “From Betel-Chewing to Tobacco Smoking in Indonesia,” \textit{The Journal of Asian Studies} 44 (1985): 529-532.
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brought them to the attention of the apothecary Pires (figure 4.1). So taken was he with their uses and the “subtlety” of their “virtue,” that he included mention of them in his 1516 list to Dom Manuel. Indeed, the entry on betel leaves was one of the longest in the letter and was one of the very few places where medical curiosity got the better of Pires. Almost the entire section related to the medicinal—as opposed to commercial—value of betel leaves. “The men of these parts,” Pires wrote,

> can sustain themselves on betel three or four days without eating anything else. It greatly helps digestion, comforts the brain, strengthens the teeth, so that men here who eat it usually have all their teeth, without any missing, even at eight years of age. Those who eat it have good breath, and if they do not eat it one day their breath is unbearable. It is a form of nourishment in these parts.⁵⁹

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⁵⁹ ANTT CC Parte I, mç.19, n. 102, f. 3v.
These invaluable leaves Pires noted, were “found in abundance” from “Chaul to Cambodia, and in all the islands, even beyond the Moluccas.” For this apothecary, betel was a readily available and highly valued commodity with a number of promising virtues. It deserved attention.

But by midcentury, the betel leaf had become one of the multiplying sites in which the ethnic, religious, and gender tensions that accompanied colonization had begun to converge. Social and cultural tensions set the parameters for what—if anything—could be said about it. When Alvares took up the quill in 1548, the use of betel leaves had become heavily coded with subversive associations. What was for many peoples throughout the region not only a commonplace accompaniment to casual conversation but an indispensable accessory in the celebration of such life-defining moments as marriage and the birth of children was, for the Portuguese, increasingly taken as a marker of all that was unbecoming to a devout and properly ordered life. When Alvares wrote to João III he did not so much as mention the plant. In the Coloquios, Orta certainly did. He made explicit what Alvares’s omission only insinuated. Orta knew the chewing of betel leaves to be a common habit and noted that women in particular enjoyed it. But he said he found it “odious,” that he had “no appetite for it.” His own “stubborn persistence,” he confessed, was no more than an expression of his wish to “remain only in the faith of a Portuguese.” Such pointed commentary notwithstanding, Orta never actually devoted a chapter to the betel leaf but instead lodged his impressions of it, together with broken pieces of information about it, in four other chapters—in one on the areca nut (with which it was—and still is—often chewed), in another on a similar leaf, the “folio indo”,

60 ANTT CC Parte I, mç.19, n. 102, f. 3v.
61 Orta, Coloquios, 473.
and in the book’s last two chapters which, taken together, amounted to a collection of things Orta claimed to have inadvertently “left out” due to his own “forgetfulness.”

The tensions to which colonization gave rise did not simply influence natural knowledge they had begun to substantively determine it. The imperative to eradicate the ties that helped bond together members of an alternative community—to eliminate as much as possible the markers of an alternate ethnicity—would wax and wane with time. It was not until the early eighteenth century that Inquisition officials were compelled to issue injunction against betel leaves. And when they did so, the new law stipulated in extensive detail every occasion in which they were not to be used. That Orta was so evasive in his coverage of the leaf suggests that the production and presentation of natural knowledge had begun to bend under the strain of social and cultural pressures much earlier.

IV

Place mattered. Orta took up more or less permanent residence in Goa in 1538 and in consequence was thrust into the epicenter of these conflicts. It was no small adjustment and the contrast between this new circumstance and his first four years in Asia could not have been greater. Between 1534 and 1538, Orta was on the move. That put him in direct contact with medical specialists and experienced commercial agents up and down the Indian littoral. As I argued in the last chapter, Orta’s technique for producing certain

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62 Orta, Coloquios, 460.
63 Some years later, when the Jesuit-cum-naturalist Acosta produced his Spanish version of Orta’s book, the betel leaf was once again left out Cristoval Acosta [Cristovão da Costa], Tractado Delas Drogas, y medicinas de las Indias Orientales, con sus Plantas debuxadas al biuo por Christoual Acosta medico y cirujano que las vio ocularmente (Burgos: Martin de Victoria, 1628).
64 APO-CR, IV, 2: 133.
knowledge of nature depended upon his ability to compare reports on *naturalia* from widely varied personal and geographic sources. Trooping from port to port with Sousa and his men made that kind of collaboration a fairly uncontentious affair. Sousa himself was the senior Portuguese official. Orta was hardly at risk of persecution. And since many of his exchanges with Hindu and Muslim physicians took place in the course of diplomatic maneuvers that placed him in the company of Deccani rulers, peaceable intellectual discourse itself could be—indeed was—passed off as part of the work of diplomacy.\(^65\) Orta, however, undertook most of his investigations not during those first years but after his settlement in Goa.

To produce medical and more broadly natural knowledge, Orta had to affiliate himself with some of the most questionable persons in what was perhaps the most violently invigilated place in Portugal’s Asian empire. Goa’s Inquisition was notoriously predacious in its efforts to enforce Catholic orthodoxy.\(^66\) And the specter of the Inquisition loomed hauntingly over Orta after its 1560 arrival. His situation in Goa was a precarious one from the start. Orta was from a New Christian family. In what turned out to be a harbinger of things to come, religious officials in the late 1530s twice prosecuted physicians in Goa on suspicion of their adherence to Judaism.\(^67\) In life, Orta managed to escape that fate, though a decade after his death he too was found guilty of the same offence. His decayed body was exhumed and burned in the heart of Goa in 1580. The protection afforded to Orta by Sousa during his governorship was not only instrumental in facilitating Orta’s work it probably also protected him from the flames of the

\(^{65}\) Orta, *Coloquios*, 475.


Inquisition. Yet the relationship between Sousa and Orta was almost certainly neither as one-dimensional nor as purely amicable as it is so often taken to be.\textsuperscript{68} Sousa’s power and the protection afforded by his patronage created opportunity but entailed obligation too. It is difficult to imagine a person of Sousa’s position, ambition, and commercial inclination (chapter 2) securing the protection of an authority on matters of medicine and natural philosophy and enabling so much investigative collaboration without also hoping to reap some reward in return.\textsuperscript{69} Patronage, then, was a compromise. It came at a cost and the recipient could pay dearly.\textsuperscript{70} The claim that Orta had once worked in the royal household has become an unsubstantiated commonplace in studies of the \textit{Coloquios}. But if it is indeed true, then Orta was probably already aware of the price Tomé Pires had paid in the service of Dom Manuel. If not, then he certainly would have heard the stories that circulated in Goa, where he also saw the misery and isolation that the webs of princely patronage had exacted from Alvares.

With Sousa’s final departure from Goa in 1545 and the arrival of the Inquisition, Orta, like Alvares, was vulnerable to suspicion and intrigue—a position in which his New Christian background was surely a liability. Here was the problem: Garcia de Orta needed to interact with \textit{vaidyas} and other knowers of nature with backgrounds and geographical exposures that were different from his own. In that way he could replicate the dynamic of travel even when he could not personally leave Goa. And he had to do so in a way that

\textsuperscript{68} Both of the most sensitive and complete studies to date take this view. Ficalho, \textit{Garcia da Orta}, 151-166, 313; Carvalho, \textit{Garcia d’Orta}, 16-23.

\textsuperscript{69} See chapter 2 on Sousa. He was from the lower nobility, which itself, according to Subrahmanyam, \textit{Portuguese in Asia}, 89-90, tended toward commercial pursuits. Hence the relations of patronage to which I refer need not be only those between an official and his subaltern but also a form of mutual exchange between two members of the maritime commercial diaspora as outlined by Studnicki Gizbert, \textit{Nation upon the Ocean Sea}, 57-58.

\textsuperscript{70} See also the discussion in Biagioli, \textit{Galileo Courtier}, 313-352.
would provoke as little suspicion as possible from his countrymen. That was not all. As I argued in the last chapter, Orta’s epistemology was one that encompassed the accounts of his own contemporaries in Goa and correspondents from throughout Indian Ocean Asia, as well as an array of classical texts, and combined all of that with impressions derived from his own somatic encounters with the things of nature. People, books, and things all had to be collected. The variety of evidence they offered had to be compared. Orta needed a space in which he could both engage with native specialists and to collect, examine, sort, and store both specimens of nature and books about them. Orta’s solution was to move science into the household.

The household lay at the very heart of Iberian notions of colonial Catholic propriety. As an ideal, the colonial household was a profoundly private and even cloistered space. Its theoretical inviolability underwrote notions of male honor and female virtue in Portuguese colonies in both the Atlantic and Indian Ocean worlds.\(^7\) Cristovão da Costa, another Portuguese naturalist and one of Orta’s near contemporaries in Goa (his Spanish version of the *Coloquios* appeared in Burgos in 1628), penned a treatise “in praise of women” in 1592 and singled out their “chastity, honesty, fidelity, [and] silence.”\(^8\) In Portugal’s colonies, a secure and well-ordered household served, among

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\(^8\) Cristóval Acosta [Cristovão da Costa], *Tratado en loor de las mygeres. Y dela Castidad, Onestidad, Constancia, Silencio, y Justicia. Con otras muchas particularidades, y varias Historias* (Venice: Giacomo Cometti, 1592), 79v-86.
</footnotes>
other things, as the guarantor of precisely those qualities. Orta’s decision was informed both by the notion of the household as an inviolable space—it offered a place for the investigative exchange of specimens and knowledge about them that was removed from the prying eyes of officials—as well as by his need to for a physical space in which to accumulate, compare, and keep the tools (books) and materials (plant and mineral matter) that he needed to carry out his work.

The Orta household stood one block west of Rua Direita, Goa’s main thoroughfare, on Rua dos Namorados. It was just about a three blocks from the city’s cathedral and two blocks from the seat of the Inquisition (figure 4.2). It sat atop a slight hill that looked down over Goa’s ribeira so that from his veranda Orta could see ships coming to port and could watch his own visitors climbing up the long steady slope toward him. Behind the house was a garden in which grew negundo and jambo and perhaps several of the other plants Orta discussed in his book. From the street, the garden was probably not visible. Linschoten’s map, which is roughly contemporary, shows that façades enclosed the whole of the block, which meant Orta’s garden abutted those of his neighbors. Whether neighbors could view one another from these interior spaces is uncertain. But in the Coloquios Orta made it abundantly clear that he was not directly accessible.

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73 Studnicki-Gizbert, *A Nation upon the Ocean Sea*, 76-89.
75 Orta, *Coloquios*, 286, 325; Carvalho, *Garcia d’Orta*, 31.
The interior space of the house was, in short, impenetrable to the gaze. It was within these walls that he collected news and information from correspondents he deemed “worthy of credit” spread from Tunis to Malacca. Orta rarely named his sources but—in a tacit recognition of the role of honor in the making of credible witnesses—he often anchored claims to their “reliability” by referring to them as married men.\textsuperscript{76} Orta’s contacts ranged from a certain Jewish merchant in Cairo to Crown-appointed officials of the Estado. They included colorful characters like the Portuguese renegade Sancho Pirez—a Matosinhense artilleryman who had abandoned Nuno da Cunha in Diu in 1534

\textsuperscript{76} Orta, Colóquios, 45, 466.
and whom Orta met at the court of Burhan Nizam Shah—and one Coje Çofar, “a native of Puglia who had become a Moor.”77 In the garden that spread out behind Orta’s home, he discussed the *negundo* trees with Ruano. In this garden too, his servant Antonia told Ruano the wonders of the *negundo* tree, which Orta explained was in common use in Goa and “for which no physician was needed . . . for upon entering a house to cure some pain there is sure to be someone explaining that *negundo* should be used.”78 It was within the protected confines of Orta’s home that the *vaidya* Malupa, who visited each morning to look after the health of Ortas maidservants, answered Orta’s queries on the origins of turbit and the use that might be made of it when mixed with ginger.79 Within Orta’s walls, a Milanese lapidary named André visited briefly to arrange the sale of some of Orta’s emeralds and, in the course of conversation, related what he had seen of a hunt for elephants and their ivory during a recent journey to Pegu.80 And there, too, the Portuguese physician and Orta’s younger colleague Dimas Bosque gathered with Ruano to share word of a vermilion stone said to be better than even a bezoar in staving off the effects of poison.81

The contradiction of course was that if Orta’s work were to be of any use to anyone, it had to follow the cast of characters who had helped produce it as they ventured back across the threshold of Orta’s household and back into the streets of Goa. Knowledge might be produced and certified within the household, but it would only be

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77 The phrase “worthy of credit” is repeated throughout the book whenever Orta introduces information from an unnamed source. Orta, *Coloquios*, 89, 91, 92, 165, 170, 184, 216, 271, 335, 450.
78 Orta, *Coloquios*, 324.
79 Orta, *Coloquios*, 435-436.
taken as an authoritative account of nature if it secured the assent of the wider Portuguese community. Enacting that translation was the most elemental function of the *Coloquios*: to take knowledge produced within the more or less private and exclusive confines of the household and transfer it as an intact, credible, authoritative, and actionable statement of certain natural knowledge into the bustling, uncertain hubbub of Portuguese Goa. The question for Orta was how to craft a text that did just that—present natural knowledge that was credible and authoritative. It was not a simple task. Why a book by a Portuguese physician should be taken as credible, let alone authoritative, when there was widespread recognition that *vaidyas*, *hakims*, *daias*, and domestic servants of varied extraction wielded so formidable a knowledge of nature was an open question. If local healers were taken as authorities on matters of natural fact then some indication of Orta’s affiliation with them might buttress his own credibility and lend weight to his claims to truth.

An open acknowledgement that he had been clandestinely collaborating with Hindu and Muslim physicians, together with women of various backgrounds, in the production of natural knowledge meant rendering visible the very interactions he sought to occlude. In this, the dialogue turned out to be the perfect representational tool. By carefully scripting his interactions with Antonia, Malupa, and the many other figures who appear in the *Coloquios*, Orta could mingle fact and fiction with considerable impunity. He could strategically signify affiliation for the sake of establishing his own credibility, while at the same time fashioning a scientific persona for himself that subscribed to conventional notions of honor and propriety in the colony, thus allaying the suspicion of

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82 Pace Shapin: “The career of experimental knowledge is the circulation between private and public spaces,” in “House of Experiment,” 400. I am not concerned with *experimental* knowledge *per se*, but I believe the observation holds equally true for Orta given the parameters within which he worked in Goa.
Jesuits, Inquisitors, and other skeptics. Since permission to print the *Coloquios* had ultimately to come from Aleixo Dias Falcão, a Jesuit and Inquisitor in Goa, the book’s very existence is a testament to the skill with which Orta managed the contradictory demands of scientific credibility, religious orthodoxy, and colonial cultural propriety.

How did he do it? The *Coloquios* entailed at least one substantial omission: Orta was a married man. Yet the *Coloquios* said nothing of either his wife or his children. Orta’s family and friends had already appeared before the Inquisition in a string of trials in which they were called not to stand for judgment but to testify on behalf of those who did. Advertising those encounters with authority could undermine his credibility and, indeed, endanger not only his own life but those of his kinsmen as well. Given the perception of domestic relations as a measure of honor and integrity, a second reason for the omission must surely have been Orta’s own turbulent married life. Orta and his wife no longer lived together; she had taken up residence on the family estate on the island of Bombay.83

Just as Orta expunged certain details that might prove injurious to his image as a capable patriarch, he also subtly insinuated suggestions of his own devout Catholicism. He referred to himself as a stubbornly faithful Portuguese.84 And on the matter of a New Christian in Tunis, upon whom he relied at several points in the text, Orta noted accusingly that he was “Spanish by language” but a “Jew by his false religion.”85 Orta also portrayed himself as a wise and compassionate but disciplined physician. In the treatment of Dom Geronimo’s brother, Orta advised that the illness, cholera, “would brook no delay” and asked to be kept informed of its course. He promptly issued a list of

83 Carvalho, *Garcia d’Orta*, 16-23.
84 Orta, *Coloquios*, 479.
medicaments to be variously combined by an apothecary (barley, cumin, sugar, castor oil, honey, quinces, white wine, cinnamon, and rosewater) and taken intermittently by the ailing man. Orta and Ruano then left the scene and as they did so Orta bid everyone farewell, suggestively adding, “may God bestow health upon this house.”

He dispensed orders to procure certain medicines from Goa’s apothecaries but there was not so much as the intimation that he might retrieve them himself. Despite the opportunity to highlight his discriminating eye for the choicest *materia medica*, rarely in the *Coloquios* did Orta mention venturing into Goa’s apothecary quarter. That was the servant Antonia’s charge. But the issue was not simply one of the division of investigative or curative labor. Goa’s geography was saturated with moral significance. It abounded with places of profligacy and debauchery, houses of pagan worship, and of Catholic propriety, and markets where the medical and commercial worlds mingled. Goa’s *boticas* (apothecaries) were gathered together in a quarter of the city still dominated by local peoples. The street they lined ran parallel to one dominated by the *vania* (Hindu merchants) who financed much of the drugs trade in Goa. Suggestively separating this quarter from that of Goa’s *casado* was the city’s pillory (figure 4.3).

Omission and aversion were two key elements of Orta’s literary self-fashioning. That refusal to venture past the *pelourinho velho* was part of a third. Since too close a tie with Goa’s Hindu community might stir suspicion, Orta took care not to conjure that affiliation in any way—even when talking about things he had learned from them. One way to do this was simply to diminish the significance of various elements of local *materia medica*, which is precisely what Orta did when he addressed substances in the *Coloquios* that had come to be associated with the most subversive aspects of local social

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86 He had said it as well on the way in. Orta, *Coloquios*, 155, 157.
life. Betel leaves provoked disgust. Opium was dismissed as morally and physically harmful: the drug provoked “indecency”—it led all too quickly to the “act of Venus”—but as a medicine was at best useless and at worst likely to kill a person; Orta was always suspicious when a compound medicine “smelled of opium.”87 And hashish (bangue), Orta pointedly noted, was “not one of our medicines” and made a fool of those who took it.88 The problem was not simply that these were either rare or unfamiliar substances. Orta

87 Orta, Coloquios, 232-233, 331-332.
88 One of the Portuguese who had allegedly fallen victim to its intoxicating virtue was an unnamed jester at the court of Vijayanagara. See Orta, Coloquios, 56.
handled those in quite another way (chapter 3). Rather, as with the betel leaf, the consumption of these seemed to either threaten or actually invert the colonial order.

Like *raiz da China*, though, some of the once unfamiliar but most commonly used *materia medica* were simply too efficacious to be ignored. 89 One of these was a treatment for “chronic dysentery” which Orta felt “compelled to confess” was “not so valuable nor so certain as the herb which the Malayalims give.” 90 The reason for such candor was twofold. First, the medicine was already widely used among the Portuguese in the royal hospital and, second, Orta was known for prescribing this and a few other related medicines developed by the “Malayalims.” 91 The day-to-day business of healing required a pragmatism that the printed word could not easily extinguish from memory. If Orta was known to use local remedies, he could hardly deny it in print. It was better to “confess” the transgression—to attenuate the corrosive influence of rumor—in an account of the several available treatments for a common illness. 92 And in any case, when such wholesale adoption of treatments were unavoidable, Orta argued for the application of a certain protocol: local remedies ought to be integrated into a Portuguese colonial pharmacopoeia but only after treatment with what Orta referred to as the “medicines of my [Western] doctors” had failed to do the trick. 93

This is not to dismiss Orta’s high regard for accounts offered by Indian specialists. All too frequently he claimed to have gotten key pieces of information from

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90 Orta, *Coloquios*, 231.
91 He had done so in the case of the treatment in question—a compound of cumin seeds and sour milk—for one *licenciado* Alvaro Fernandes Orta, *Coloquios*, 230-231, 233.
92 Orta, *Coloquios*, 309-310, rendered a similar “confession” in his account of his treatment of Martim Afonso de Sousa during their trek toward Ahmedabad.
93 Orta, *Coloquios*, 308
them. But he portrayed such instances of reliance as matters of practical necessity and the relationships by which they were ascertained as impersonal. So for example: lest his connection to Burhan Nizam Shah, the ruler of Ahmadnagar, raise Inquisitorial eyebrows, Orta took care to tell his readers that he had been “well paid” for the work. Their relationship was strictly medical and all debts had been satisfied. Accounts of his reliance on Indian specialists, moreover, did not mean that Orta took them on their word. Rather, he portrayed Indian healers as both ignorant of anatomy and beset with a lack of curiosity, and he portrayed Indian merchants as cunning and backhanded. For example, Orta related that since he and most other Portuguese were “very little conversant with the things of the Kingdom of Delhi,” errant yogis were necessarily taken as informants on a prized cure for poison (Orta called it baçaraga) thought to come from there. But what they said about it, so Orta claimed, “was contrary to all good philosophy,” and at any rate, he insisted, “what they tell us on one day they deny on the next.” Orta could advertise his own engagement with potentially suspect figures by touting his own manipulation of their confidence in order to ferret out their deceptions. So when a vania revealed how he adulterated the camphor that came from Borneo with a Chinese variety that was cheaper and of poor quality, Orta turned that knowledge over to

94 Orta, Coloquios, 83, 205, 245, 251.
95 Orta, Coloquios, 80-81: difficult to find on apothecary shop and identify
96 Orta, Coloquios, 264: no involvement from Orta as Antonia suggests/prepares betel for Ruano ; 299: uncommented observation; reliance but payment;
97 Orta, Coloquios, 65, 82.
98 Studnicki-Gizbert, Nation upon the Ocean Sea, 57-58.
99 Orta, Coloquios, 308, 431-432, 435.
100 In addition to the following examples and my discussion of these concerns in the previous chapter, see Orta, Coloquios, 303-307.
101 Orta, Coloquios, 483.
his readers: “all those things must be prepared for by those who wish to speculate in camphor,” he warned.102

V

If the dialogue was a conventional and increasingly outdated genre of scientific exposition among many naturalists at work within Europe, Orta’s embrace of it in Goa should not be taken as a mark of intellectual backwardness anymore than his emphasis on first hand experience should be taken as evidence of singular foresight and innovation. The dialogue form of presentation enabled Orta to script potentially incriminating interaction in ways that the expository form so fashionable in the West could not. Instead of making a claim outright, Orta was able to make visible the process by which he reasoned his way through an array of evidence toward a conclusion with collaborators, themselves widely held to be authoritative. He advertised his own personal affiliations in a way that enhanced his intellectual credibility in Goa and buttressed the authority of the Coloquios. But rather than leave his exchanges to the Inquisitorial imagination, he offered a portrait of his domestic life and work that might mitigate suspicion, intrigue, and accusation. Hence the dialogue also provided a way for Orta to manage the risks attendant upon the production of knowledge and the practice of medicine in Goa.

In effect, Orta was able to display a command of natural knowledge without personally claiming ownership of it and without tying himself too closely to the women and native physicians who did. Here was a situation analogous to the one facing the apothecary Pires and the pilot Rodrigues a half-century earlier. A credible and authoritative account of the natural world demanded not the appropriation and occlusion

102 Orta, Coloquios, 90, 92-93, 166-167, 300, 454.
of peoples and their knowledges but their visible embrace. And yet colonizing ambitions
and had engendered tensions that made the easy and open embrace of native physicians
and alternate knowledges much more problematic. In Goa, Orta’s insinuation within
colonial networks of patronage, protection, and investigation made his position
considerably more precarious and the politics of visibility and occlusion—fact and
fiction—more fraught.
Circulating Uncertainty
Doubt, Dissent, and the Taxonomy of Disease

“Even the best of books has its faults.”
—Aleixo de Abreu in the *Tratado de las siete enfermedades* (Lisbon, 1623)

“Avicenna had many doubts about the distinctions between things. And when he doubted, he wrote two chapters.”
—Garcia de Orta in the *Colóquios* (Goa, 1563)

I

Pero Vaz de Caminha might have been right. That unfamiliar coast in the southwestern corner of the Atlantic may indeed have been marked by prodigious fecundity. Its peoples might well have been as comely and as fit for political and religious submission as Caminha had claimed. His letter to Dom Manuel I in late April of 1500 was certainly not the last account filled with assertions like those. Rather, the news it brought sparked a series of reports about this southerly coast that soon circulated in manuscript and print from Lisbon to Paris and eastward to Venice—many centrally concerned with Brazil’s

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1 Aleixo de Abreu, *Tratado de las siete enfermedades: de la inflamacion universal del higado, zirbo, pyloron, y riñones, y de la obstrucion de la satiriasi, de la terciana y febre maligna, y passion hipocondriaca. Lleva otros tres tratados, del mal de Loanda, del guzano, y de las fuentes y sedales* (Lisbon: Pedro Craesbeeck, 1623), [seventh un-numbered page].

flora and fauna and—especially—its native peoples.\(^3\) Fifty years later when the Jesuit
Superior Manuel da Nóbrega insisted that the whole region was bereft of debilitating
fevers, his confirmation of Caminha’s original claim was couched in a report that, though
concerned with disease, was focused principally on Brazil’s potential as a site of
missionary work. It was one of several long letters Nóbrega penned shortly after landing.
And these, taken together, formed the basis of Nóbrega’s brief but more comprehensive
account of Brazil, the *Informação das terras do Brasil* (1551), an introduction to this new
realm that was published in several languages. José de Anchieta—Nóbrega’s Jesuit
colleague and sometime secretary—followed soon thereafter with a more wide-ranging
natural history of Brazil. And it too appealed to a broad readership. But not, however, in
Portugal: published first in Venice, in Italian, in 1561 as *Avisi delle Indie di Portogallo*,
Anchieta’s account of the flora and fauna of Portuguese America was only later printed in
Latin and Portuguese.

The book’s history was a harbinger of things to come. The next lengthy
consideration of the region’s nature by a Portuguese only went to press some thirty years
later in 1584, in the form of an essay titled *Do clima e terra do Brasil e de algumas
cousas notaveis que se acham assim na terra como no mar*.\(^4\) But in the three decades
separating these two pieces of writing, the most widely circulated publications on Brazil
came from the pens of northern European travelers. Among the most widely circulated
were those of André Thevet, Anthony Knivet, Jean de Léry, and Hans Staden. Thevet
gathered his notes while in the French settlement at Guanabara (at modern Rio de

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\(^3\) In Portugal, work often circulated in manuscript form. See the discussion in Anson C. Piper,
“Jorge Ferreira de Vasconcellos: Defender of the Portuguese Vernacular,” *Hispania* 37 (1954):
400-425.

\(^4\) John Hemming, *Red Gold: The Conquest of the Brazilian Indians* (Cambridge, MA:
Extracts from the publication of Thevet’s account—including the woodcuts—found their way into Clusius’s *Aromatum et simplicium*. Hence, by midcentury a stream of detailed material about the flora, fauna, and peoples of Brazil had begun to find its way into printing houses from Lisbon to Antwerp and Venice. It piqued the interest of European rulers and fired the imaginations of merchants and missionaries. It helped transform the South Atlantic basin into a principal theatre of imperial rivalry, commercial competition, religious proselytization, and plantation slavery.

But back in Lisbon, late in the spring of 1500, Dom Manuel’s reaction to Caminha’s news was most notable for its restraint, and for what the Portuguese monarch did not—indeed could not—do. Having read Caminha’s letter and listened to reports of captain Gaspar de Lemos and his crew (their supply ship was originally to follow Cabral to Cochin but returned straightaway to Lisbon with news of the landfall), Dom Manuel had good cause to ask that most intractable of questions: So what? The answer was anything but clear. By 1500, sugar from Portugal’s Madeira colony was so plentiful that it outgrew demand throughout the whole of Western Christendom; the São Jorge da Mina Castle was now one of a number of ports in East and West Africa where royal factors busily accumulated gold, ivory, and slaves; and nearly a century of lucrative trade and intermittent exploration along the western littoral of Africa had only two years earlier left Portugal with direct and (for the moment) unrivalled access to the very India that the Spanish monarchs had only hoped for. Cabral’s South American landfall took place in the

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wake of all that. So Caminha’s exuberant description of Edenic verdure, supreme health, and prelapsarian innocence at the western edge of the Atlantic must have seemed a lackluster footnote to Gama’s tales of ivory, silver, spices, textiles, and a kind of exotic Christianity that was all the more remarkable for its very strangeness. And even after the some of those Christians of the South Asian coast turned out to be—to the disappointment of many—merely Hindu pagans, the vegetable and material richness of the Indian Ocean seemed not to disappoint. What, by comparison, was Brazil to offer?6

It was in part to answer that question that in May of 1501 Dom Manuel sent an exploratory voyage back across the Atlantic. Under the command of one Gonçalo Coelho and including the Florentine Amerigo Vespucci, the expedition had a number of aims: to set the route, explore the coast, and to determine what—if any—commercial value the region could promise. Judged by these three aims alone, the voyage was a success. Gonçalo as his men explored and gave Portuguese names to some five hundred leagues of shoreline between Cabo São Roque and Cabo Frio, noting their route and retracing Cabral’s earlier passage of Monte Pascual—the inland mountain whose summit was the first evidence of dry land spotted by Cabral’s crew two years earlier. If Caminha’s letter of 1500 had lodged Brazil into the imperial imagination, the 1502 voyage chronicled by Vespucci put it firmly on the imperial map. When the last round of corrections was made to the Cantino atlas in 1502 (just before it was smuggled to Ferrara), it included precisely these details from the Coelho-Vespucci voyage. Names dotted the coastline. Monte Pascual stood midway between the northern and southern capes; that landmark was now loaded with the symbolic meaning of the founding passage and made into an orienting

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6 Here my interpretation of what Anthony Pagden has termed the “problem of recognition” differs from that of J. H. Elliott, *The Old World and the New, 1492-1650* (New York: Cambridge, 1970), who was concerned with a developing appreciation for the novelty of the Americas.
point for Portuguese sailors that would outlast the colonial period. And the profuse and colorful nature described first by Caminha and then by Vespucci inhabited the land’s interior (figure 5.1). Unlike the Portuguese scribe, however, the Florentine financier-cum-chronicler was unimpressed with the region’s commercial potential. Except for a few marketable items (including brazilwood and exotic birds, specimens of which were brought back to Lisbon), Brazil did not fail to disappoint. As Vespucci noted, “one can say we found nothing of profit there except an infinity of dyewood trees, canafistula . . . and other natural marvels that would be tedious to describe.” Though they had not been there, several observers agreed. Julius Caesar Scaliger, for one, did not mince words; the spices of Brazil, he wrote, were “scarce, ignoble, and bad.” The glitter of the East had transformed wonderment into mere tedium in the West; marvel need not have compelled possession.

In the opening years of the sixteenth century, that was Brazil: a land with an exotic inventory but dubious allure. Dom Manuel hardly knew what to do with it. He awarded a short-lived monopoly on trade with Brazil to a consortium headed by merchants already heavily involved in African and Indian ventures. Successive voyages brought back dyewood, a few Amerindian slaves, and a number of exotic animals. And in the process the consortium oversaw the construction of the first royal factories along the coast—one at Pernambuco, the other at Porto Seguro. But the concession expired in 1505 and for almost three decades—with the construction of a handful of other factories—a

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very limited trade continued under the direct control of the Crown. Dom Manuel’s focus all the while remained on Asia.10

Ambiguous reports from the Coelho-Vespucci voyage had prompted no more than the tenuous embrace of a Brazil trade. But in an era of shared seaborne ambitions and

Figure 5.1. The Dubious Allure of an Atlantic Island: Detail of Brazil on the Cantino Planisphere. Monte Pascoal is the protrusion north of Cabo Frio.

10 A review of few known details of these can be found in Johnson, “Settlement of Brazil,” 8-9. He has suggested that the development of trade with Brazil followed rather closely a pattern set in West Africa, in which discovery was followed by a brief period of private exploration, information from which was then used to strengthen a trade under tight royal control. In its outlines the pattern seems to hold. But my argument that a persistent uncertainty characterized Dom Manuel’s policies stems from the pronounced differences between the African and Brazilian cases, which Johnson’s model does not recognize. The former remained a theater of concerted activity; the latter did not. The western African coast, rather than the South American one, offered riches and a path to Asia.
growing Atlantic competition, Portugal’s was an untenable policy. Castile posed the most immediate seaborne danger to the meager trade. And it was partly to mitigate the threat of conflict that Dom Manuel had promptly notified Ferdinand and Isabella of Caminha’s report. This new land would, the Portuguese king assured his Castilian relatives, be of value principally as an entrepôt en route to India. And although the Treaty of Tordesillas had sought to ensure that Portugal and Castile would enjoy unrivaled access to its respective spheres of commerce and proselytization, doubt remained as to how closely activities on the ground would reflect the terms of the treaty. For that reason in 1501 Manuel had also asked Gonçalo Coelho to resolve one of the many questions opened by Caminha’s report. When the would-be scribe of Cochin wrote of Brazil, he had referred to it as “Ilha da Santa Cruz”—the Island of the Holy Cross. And whether or not Brazil was, in fact, an island was an issue with deep implications for the security of Portugal’s claim to territory on the far side of the Atlantic. The existence of two large bodies of water—both of unknown extent—at either end of Brazil’s known coast seemed to suggest that it was, in fact, a large island. And if that were true then its limits could be easily discerned and its territory more readily defended—at least in metropolitan legal battles. But if these turned out to be the mouths of giant rivers, then the threat to any eventual claim to sovereignty that Portugal might wish to make later were greatly increased. For control of the mouths of rivers portended control of upriver territory. And control of upriver territory would allow a competing state—in this case Castile—to make the claim that it, rather than Portugal, should enjoy sovereignty over what was potentially as vast and wealthy interior. Indeed, that kind of claim to upriver sovereignty rooted in control

11 Johnson, “Settlement of Brazil,” 9. These were the Amazon River in the north and the Rio de la Plata in the south.
over river access was part of the shared legal repertoire that had already framed early explorations along the African littoral and in the Caribbean. They were part of what had compelled the Tordesillas agreement in the first place.\(^{12}\)

Hence the question of Brazil’s hydrography was deeply political. And it was here that the Coelho-Vespucci voyage had utterly failed. The consequent uncertainty was all too evident on the Cantino atlas. Unlike Africa, which was depicted in its continental entirety, or Sumatra, which was clearly distinguished from the long arch of the Malay peninsula, Brazil was neither firmly attached to other lands nor definitely self-contained. Those brightly colored plants and animals of Brazil inhabited an expansive interior whose limits had still to be demarcated. It was a land inhabited but unbound. The only feature that lent it any location at all was the verdant, sinuous edge where the sea met the shore. And indeed, most Portuguese in these early years were concerned only with transactions across that line. If maps were instruments for and indices of the extension of colonial power, the Cantino atlas accurately reflected Portugal’s limited interest in, knowledge of, and control over the South American littoral. Although it was on the map, Brazil in 1502 was so little known among the Portuguese that it could scarcely occupy any cartographic space whatsoever. In the colonial sense, as far as the Portuguese were concerned, Brazil at the time was barely a place at all.

Yet if Portugal were to keep what it had won in negotiations with Castile, a policy that was so little concerned with events beyond the narrow green ribbon of shoreline was simply untenable. At the level of high office came a legal challenge—not from Spain but

France: armed with a coterie of jurists, France’s Henry II contested the papal jurisdiction that was supposed to underwrite the Tordesillas treaty. But conditions on the ground on the far side of the Atlantic quickly outpaced metropolitan legal wrangling. Intermittent skirmishes near Porto Seguro, Vitória, and Rio de Janeiro, and a French settlement at Guanabara Bay would help compel Dom Manuel’s successor João III to embrace coastal settlement—not seaborne primacy—as an imperial strategy in Brazil. As early as 1504, French ships had begun to load dyewood along the Brazilian coast. The set route established for Portuguese vessels by the Coelho-Vespucci expedition became a liability. The predictable passage of cargo-laden Portuguese caravels made it easier for French privateers to capture them and seize their cargo. In 1516, under the command of one Cristovão Jacques, Dom Manuel began to dispatch (albeit only intermittent) war fleets to both police the established sea-lanes and to drive French traders from the South American coast. But the strategy was even less likely to succeed in the Atlantic than it was in the Indian Ocean. The French traded with Brazil’s coastal Tupi peoples directly from ship. They did not depend on permanent fortifications. In effect, the French could trade anywhere along a five hundred league (two thousand mile) coastline. Hence Portuguese commanders like Jacques were never sure where to focus their patrols. Between 1520 and 1530, as predictability became liability, the French managed to capture a yearly average of twenty Portuguese vessels. French trading increased the supply of brazilwood on the Antwerp market. Prices dropped accordingly. And their successful privateering meant that the royal counting house in Lisbon claimed an ever-smaller share of the slumping profit.13

Enter Martim Affonso de Sousa. It was as João III’s man in Brazil that Sousa earned his more prestigious and more lucrative Indian Ocean appointments first as admiral of the royal fleet and then as governor of Goa. Between 1530 and 1533—a decade before cholera decimated Goa and before the identity of pepper became so pressing an issue—Sousa was attempting to settle the Island of the Holy Cross. With five ships and some four hundred settlers, his charge from Dom João was threefold: to explore the mouths of the Amazon and La Plata rivers (the island question had been settled but uncertainty remained about their proximity to the Tordesillas meridian); to police the coast and to rid it of French traders; and to establish a single royal colony. The latter he did in 1532 at São Vicente in southern Brazil, where he oversaw the construction of one of Portuguese America’s first sugar mills. The plantations remained. The strategy of a single colony did not. The challenge posed by the French—grounded in legal ambiguities and enabled by Dom Manuel’s less than total embrace of a colonial enterprise in Brazil—finally moved João III to take a different tack. A new policy was called for that could both make Brazil a profitable venture and canvas the entire coast between the two as-yet uncharted rivers.\textsuperscript{14}

The donatary captaincies were engineered to do just that. Fifteen heritable grants of territory were awarded to twelve loyal servants of the Crown—among them the chronicler João de Barros and João III’s loyal captain of the sea, Martim Afonso de Sousa himself. The grantees enjoyed several privileges and in exchange were obliged to sponsor settlement and develop the local economy in a way that generated taxable revenue. Sousa was not the only one to experiment with sugarcane. With Crown incentives, cane cuttings

were introduced into each of the fifteen captaincies. Dom João was poised to import to mainland South America a form of plantation settlement that was at the time largely restricted to a handful of diminutive Atlantic islands. The arrangement had the intended effects of promoting agricultural experimentation and of scattering small settlements of Portuguese up and down the coast. Otherwise the results were disappointing. Donatariol neglect was one problem. Adequate financing was another: milling equipment was expensive. The most intractable issue was that of labor: Mediterranean, mainland Iberian, and Atlantic island sugar plantations had only succeeded where a large and flexible corps of workers was readily available. And it was only with a patchwork of immigrant, indentured, and enslaved labor that Portuguese settlers and an international set of financial backers had managed to profitably cultivate sugarcane on Madeira and then São Tomé. Hence in Brazil it was at São Vicente in the South and Pernambuco in the north, that early cane planting had proven most successful. In both captaincies, grantees were on site, had the advantage of metropolitan financial support, and—crucially—enjoyed close and amicable relations with native communities. Peaceable labor arrangements made sugar possible and profitable. And when they finally unraveled—as eventually happened in the captaincy of Bahia—the result was the costly destruction of the mills and, with them, the area’s sugar industry.\textsuperscript{15}

The captaincy system had the effect of shifting Portuguese ambitions in the western Atlantic from seaborne primacy along the coast to landed conquest.\textsuperscript{16} It would


\textsuperscript{16} The observation is Johnson’s in “Settlement of Brazil,” 12-13.
turn an erstwhile seaborne empire into a fledgling colonial power.\textsuperscript{17} Yet in making that shift, João III had failed to craft a coherent and enforceable policy toward the region’s native peoples.\textsuperscript{18} Settlements along the coast might have hindered some French incursions since the move drove an occasional wedge between French traders and their Tupi contacts. But the Portuguese presence was still thin and Dom João’s reach extended tenuously only as far as the scattered coastal enclaves. The Portuguese monarch had neither influence nor emissaries among the coastal peoples whose resistance had in several cases (that of Bahia being only one of the most salient) already thwarted the colonizing efforts of his subjects. Dom João needed to secure royal authority and ease relations with Brazil’s native peoples—and he needed to do so in a way that would generate a stable labor force. Hence, even as it promised to safeguard Portuguese claims, protect its trade, and promote the development of a lucrative sugar economy, the move inland opened the question of a coherent policy toward Brazil’s native peoples. And that, in turn, sharpened the issue of legitimacy in quite another way. The legitimacy of Castilian claims to its American colonies had already come under fire because of what some observers—from colonial missionaries like Las Casas to metropolitan jurists like Francisco de Vitória—argued was the Spaniards’ rapacious exploitation of Amerindian

\textsuperscript{17} What has so often appeared as a distinction between Spanish and Portuguese modes of imperial expansion was, I argue here, an effect of the particular circumstances faced by policymakers in Lisbon and Madrid. For alternate interpretations see Sanjay Subrahmanyam, “Holding the World in Balance: The Connected Histories of the Iberian Overseas Empires, 1500-1640.” \textit{American Historical Review} 5 (2007): 1359-1385; and Patricia Seed, \textit{Ceremonies of Possession in Europe’s Conquest of the New World, 1492-1640} (New Work: Cambridge University Press, 1995).

\textsuperscript{18} On this policy, the classic study of early interactions is Alexander Marchant, \textit{From Barter to Slavery: The Economic Relations of Portuguese and Indians in the Settlement of Brazil, 1500-1580} (Baltimore: The Johns Hopkins University Press, 1942). See also Johnson, “Settlement of Brazil,” 13-29. It was a recurring issue with the opening of each new frontier. See most recently (and on a much later period) Hal Langfurs, \textit{The Forbidden Lands: Colonial Identity, Frontier Violence, and the Persistence of Brazil’s Eastern Indians, 1750-1830} (Stanford: Stanford University Press, 2006).
peoples. If, as asserted by proponents of the Treaty of Tordesillas, the legitimacy of New World settlement was underwritten by the salvation of native peoples through Catholic conversion then in neither Iberian empire could colonization be built on outright Amerindian slavery. And rumors to that effect were beginning to circulate about Brazil.¹⁹

It was at this point—in the mid-1540s—as the intertwined issues of labor and colonial legitimacy had begun to draw to a head, that news from Bahia and rumors from Paris coincided with the collapse of revenue from the Estado da Índia, giving Dom João III motive, means, and opportunity to craft a Brazil policy that might be sustainable, profitable, and unquestionably legitimate. In Brazil’s north, in the captaincy of Pernambuco, sugar had already become a successful and lucrative export. News from Bahia to its south suggested that it could be there too. And the unexpected death of its heirless donatary made it possible for Dom João to reclaim it. The Crown now had exclusive access to some of the most promising agricultural land (and, as it turned out, one of the best ports) in the colonies. The timing could hardly have been better. The same downturn that caused famine on the Coromandel Coast and threatened financial ruin to the Estado da Índia pushed the Crown to invest in sugar cultivation and milling technology in the captaincy of Bahia.

Yet no part of the colonies, least of all that owned and administered directly by the Catholic monarch could afford to appear as callously violent as had been the case. Who could to serve as intermediaries? A decade earlier, one Diogo Gouveia in Paris had begun to write to the Portuguese king of a group of young, ambitious, and charismatic

students then coalescing in the colleges of the University of Paris. Gouveia, a Portuguese principal at the College of Saint Barbe, had come to know several of them personally, including its apparent leaders, Ignatius Loyola and Diego Laynes. They had not yet made their storied sojourn to Rome, where their Society of Jesus would earn papal approval as post-Tridentine Europe’s newest missionary order. That happened in 1540. But by the time the first Crown-appointed governor-general sailed into All Saints Bay in May of 1549, the Jesuits were already in Goa. With Brazil’s first governor, Tomé de Sousa, they came to Brazil. Now the missionary order straddled the empire. Unlike in Asia, where the Jesuits were often diplomatic intermediaries and hence extensions of a imperial bureaucracy, where their efforts were focused on matters distant from the imperial seaborne trade, and where their missionary work was geographically expansive but numerically limited, in Brazil, the Jesuit missions were critical to the perceived legitimacy of Portuguese sovereignty and they positions themselves as indispensable to the colonial endeavor and to its commercial success. For that reason, the stability of the Jesuit missions and the successful indoctrination of their Amerindian neophytes mattered not just for their own religious mission but to the legitimacy and the profitability of Portuguese claims in Brazil. And that meant that when the Jesuit Diogo Jácome died of a fever in April of 1565, much more was stake than the life of a single missionary.

Diogo Jácome came to the captaincy of Espírito Santo early in 1564 as one of four Jesuits charged with proselytizing the Amerindian communities in the hinterland of the small Portuguese settlement of Vitória. His was a short and troubled stay. The epidemic that would lead to his untimely death broke out in the missions there only months after Jácome arrived. Its epicenter was in Nossa Senhora da Concepção, the mission under Jácome’s supervision. By September of that year a community that was according to one account “large and full of people” (the author put the number at over four hundred) had now been reduced, “by the force of illness,” to a contingent of scattered villagers whose number was too small too record. The disease had spread quickly. According to one of Jácome’s colleagues it “filled every house with the ill and the dying.” “Homes,” this missionary recalled, “became hospitals.”

Jácome and his Jesuit assistant Pero Gonçalves at first busied themselves with care for the sick and tried to confess and baptize the dying. But the pace of death—three and four a day—overwhelmed their efforts. The two spent much of their time digging graves and burying the dead. When in September the epidemic finally came to end, Nossa Senhora da Concepção was left with little more than the fetid odor of human decay to remind villagers of what had happened. And it was for both of those reasons—the smell and the memory—that Jácome and Gonçalves relocated the entire aldeia. In the process, the mendicants themselves began to sicken. Gonçalves died first, in early November. Days later, Jácome developed the fever that would end his life the following April, barely a year after he had come.

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22 MB, IV: 270.
For Pedro da Costa, the Jesuit who recorded all of these events, the story of Nossa Senhora da Concepção was a difficult one to tell. Precise details escaped his recollection. Costa faulted his own feeble memory. He also faulted the wreck of the ship that was supposed to have delivered his original letter detailing the epidemic. But with palpable sorrow he admitted that the real problem ran deeper. The whole episode was simply hard to make sense of—or, as Costa himself put it, it was that “the acts of God” had become “indecipherable.” By 1564, that was precisely the problem—now all too evident—facing Jesuit missionaries who ventured into the coastal hinterlands in support of Portuguese colonization: How could it be that so many people died with such evident frequency? As another Jesuit would put the matter some years later, “no one would ever believe that so many people could ever be used up, let alone in such a short time.” For Jesuits in Brazil, the nature of disease and the scale of death challenged all comprehension.

Costa’s brooding circumspection was not, however, common. Until the mid-1550s, disease and death were conceived not as problems challenging the missionary enterprise but as powerful forces of good. Illness was opportunity, and death a victory. During the first few years of their work in Brazil, the Jesuits’ exploratory peregrinations took them far beyond the capital of Salvador. They established three principal fields of activity (figure 5.2): one in Bahia (the captaincy that was home to the colonial capital of Salvador), another in Espírito Santo (where the tragedy of Nossa Senhora da Concepção unfolded), and a third in São Vicente (where Sousa had earlier established sugar  

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24 MB, IV: 271.
25 MB, V: 112. The author was José de Anchieta.
Figure 5.2. Portuguese Settlements and Major Ports of Trade in Brazil. Francisco Bethencourt and Diogo Ramada Curto, *Portuguese Oceanic Expansion, 1400-1800* (New York: Cambridge University Press, 2007), xxi.
plantations).  

Everywhere, Jesuit missionaries found themselves surrounded by sick and dying natives. Episodes like the epidemic at Nossa Senhora da Concepção seemed to play out wherever the Jesuits went. And yet where disease was concerned, their earliest letters were marked by a deeply held certainty about the causes and ultimate purpose of these illnesses, and by an abiding confidence in their own ability to manage them. Diseases were, to use Costa’s phrase, “acts of God.” And they were meant to facilitate the Jesuits’ conversion of Brazil’s native peoples. The Jesuits interpreted the misery and death brought by disease as divine punishment for the recalcitrant behavior of native adults—those who refused conversion, those who submitted to it only to abandon the spiritual community of the mission, and for those who remained in them but secretly persisted with their diabolical rituals (cannibalism was the favored accusation). For the faithful, death was understood as a reprieve. When children died—converted or not—Jesuits took it to mean one or both of two things: it was a sign of divine mercy, since young natives escaped the pernicious influence of their parents; and it was a way to castigate the parents themselves, as their evident suffering served as repayment for their unrepentant resistance to the missionaries’ efforts.

Taken together, those explanations were the starting point for Jesuit interpretations of disease.  

But they quickly began to dissolve. Historians of colonial Brazil have emphasized the epidemiological catastrophe that unfolded in Jesuit mission

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26 These were foci of missionary activity but the Jesuits’ work was not limited to these locations. For an overview of their work and progressive geographic dispersal, see the sections on Brazil in Alden, The Making of an Enterprise.

communities. They have stressed either the Jesuits tireless medical work\textsuperscript{28} or have argued that Jesuit policies evinced, at bottom, a self-serving callousness.\textsuperscript{29} On the latter point, John Hemming has been most pointed: to the Jesuits “what really mattered was pride in maintaining the mission system. [They were] obsessed with their personal soul-count.”\textsuperscript{30} But deeply held faith, fervent mission work, and an unrelenting embrace of violence and kidnapping in the service of their work (though utterly abhorrent) never extinguished their capacity to respond with horror, sympathy, and basic incomprehension at what they witnessed. The shifting reactions of Jesuit missionaries to what they found to be inexplicable and uncontrollable epidemics deserve to be taken seriously.\textsuperscript{31} Stuart Schwartz has recently shown that in the Iberian colonies, even members of both the secular clergy and the missionary orders held differing and at times dissonant views of their faith.\textsuperscript{32} Doubt was not uncommon. Letters of the first generation of Jesuit missionaries in Portuguese America bear this out. And their subtle expressions of uncertainty and doubt as it surfaced in their writing revealed what no other sources from the period can: They expose the emergence of a set of concerns about specific illnesses that—in one way or another—that threatened everyone in Portugal’s American colonies.\textsuperscript{33}


\textsuperscript{29} Hemming, Red Gold; Alida C. Metcalf, Go-Betweens and the Colonization of Brazil, 1500-1600 (Austin: University of Texas Press, 2005), see the chapter on “biological go-betweens.”

\textsuperscript{30} Hemming, Red Gold, 145.

\textsuperscript{31} For a similar point about the “civilizing mission” of the British and the French later, see Michael Adas, Machines as the Measure of Men: Science, Technology, and Ideologies of Western Dominance (Ithaca, NY: Cornell University Press, 1989).

\textsuperscript{32} Stuart B. Schwartz, All Can be Saved: Religious Tolerance and Salvation in the Iberian Atlantic World (New Haven, CT: Yale University Press, 2008).

\textsuperscript{33} For the era before about 1620, these are the best sources and most detailed sources for nearly all facets of colonial Brazilian society. Letters offer what no other available source can.
The epidemiological concerns evinced by the Jesuit letters resonated as well with all members of colonial society.

For the Jesuits, the distance between the evidence of their own experiences of disease and the weight their explanations seemed to carry grew wider with each new encounter. The lands surrounding the new colonial capital of Salvador constituted the very first Jesuit mission field in Brazil. And in 1551 that field grew only tentatively to include contacts among a number of Tobajara settlements in the interior of Pernambuco, the captaincy to Bahia’s north. Manuel da Nóbrega, Francisco Pires, and a handful of Jesuit neophytes, were there for barely a year. It was enough time to erect a series of crosses and to note that a “general cough” had spread among their Tobajara hosts. At the foot of one of those crosses, a young girl fell ill and lingered near death. The villagers argued that Nóbrega, Pires, and their companions were to blame for the sickness. The priests, one missionary recorded, countered that on the contrary “[the Jesuits] brought only life.” Nóbrega argued that members of the Tobajara community could escape disease if only they would submit to the rituals of Catholic conversion and to the order of mission village life. If that explanation satisfied the Tobajara, neither Nóbrega nor Pires said so. But they refused the missionaries’ offer. Rather than stay in Pernambuco, the Jesuits returned south.34

That incident made its way into a letter that another Jesuit, Vicente Rodrigues, penned from Bahia in May of the following year.35 When Nóbrega and his companions first left for Pernambuco, Vicente Rodrigues had stayed behind in Salvador to run a small hospital and to care for the colonial capital’s sick and infirm. While his colleagues were

34 MB, I: 320-321. As with his earlier visit to Porto Seguro in 1550, Nóbrega did not establish lasting missions here at this time.
35 MB, I: 303-322.
away, Rodrigues’ own calamitous battle with epidemic disease had given him good reason to note his colleagues’ account of the ill-defined “general cough” of Pernambuco. As Nóbrega and the others built crosses among the Tobajara to the north, a sickness engulfed the whole of Salvador. It overwhelmed Rodrigues’s hospital before spreading beyond the city, where it threatened to overtake the entire system of Jesuit-run villages that dotted the Bahian hinterland. These aldeias of Tupinamba—some had converted some had not—were in the throes of an epidemiological assault. But Rodrigues knew precisely how to interpret the deaths. A large contingent of Tupi villagers had been poised to enter the Catholic fold until, at the last minute, they recanted. The epidemic and particularly the death of countless young children was, as Rodrigues had it, one of the “many tests put to them by our god.” The demise of one Tupi elder (principal) seemed to bear out the logic of Rodrigues and his companions. Nicknamed Puerta Grande, the elder had already been reprimanded for his “vices.” When Puerta Grande fell sick, Rodrigues or one of his colleagues warned him of his impending death and offered him confession, baptism, and conversion. The elder brandished his bow, said that he was fearless, and refused their advances. Rodrigues noted Puerta Grande’s demise without the least emotive detail. He his recalcitrance left him exposed to this most recent plague. No more explanation was needed.

But catastrophe had already begun to strain that logic. Even with an explanation at hand, Rodrigues found the death of another elder more difficult to bear and the loss of so many children deeply troubling. The death of the principal Tacuí nearly coincided with that of Puerta Grande. But the similarity between them ended there. For the Jesuits found a more sympathetic ally and eventual convert in Tacuí. His refusal to leave neither of his

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36 MB, I: 317.
two wives had for a long time kept him from confession and conversion. But among the missionaries he was nevertheless widely regarded as “a friend of the Christians” and as a person who “tried much more than [the other Tupi converts] to adhere to natural law [and was] famous for not eating human flesh.” Tacuí was finally overcome by a “great desire for baptism.” Rodrigues wrote sorrowfully that only a few days after the ceremony Tacuí himself “fell ill” and then died.\(^37\) It was, however, the death of the children that was most challenging. It seemed “such a strange thing,” Rodrigues reflected, “particularly among boys and girls so small, [for they] seem to have done nothing wrong at all.”\(^38\) That note of distress was not shared by all of Rodrigues’s colleagues. Back from Pernambuco, Francisco Pires also recorded the events of 1552. He was less circumspect. The children, he wrote, had been “baptized in innocence and had died in innocence.” Their parents and elders deserved no such mercy: disease and death were brought about by their own pervasive lapse in devotion and was intended to instill fear and obedience in the newly converted who might survive.\(^39\) Uncertainty and doubt crept slowly and unevenly among the missionary ranks. But Pires too was moved by what he had seen. Both men conceded some surprise to find that so many Tupi continued to seek out the Jesuits’ care and leadership even as, in Pires’ words, so “many of them do die.”\(^40\)

By 1553, Nóbrega, along with two other priests, José de Anchieta and Bras Lourenço, had sailed for the more southerly captaincies. They stopped first in Espírito

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\(^37\) *MB*, I: 317-318. There is some confusion here. In *MB*, I: 317, n. 4, the editor suggests that a principal known by the Portuguese name Dom João and nicknamed Puerta Grande was actually Tacuí. But that the description of them and the accounts of their deaths both appear in the single letter by Vicente Rodrigues and discussed only paragraphs apart would seem to indicate that they were indeed different people—or perhaps at least that Rodrigues meant to refer to different people even if he fumbled the names.

\(^38\) *MB*, I: 303.

\(^39\) *MB*, I: 391.

\(^40\) *MB*, I: 395. I have added italics for stress in my translation.
Santo, where Lourenço agreed to stay behind. He established the mission at Nossa Senhora da Concepção (among several others) that Jácome and Costa would find over a decade later, in the spring of 1564. Nóbrega and Anchieta continued on to São Vicente. The mission there was already underway among the Carijó and would grow to include other Guaraní speakers, including the Ibiapirara, in whom Anchieta found dutiful converts despite their noted tendency to collect and display the desiccated heads of vanquished foes.41

The specter of disease had followed them south. In just over a year, many of the converted Carijó were wiped out.42 The entire aldeia of Maniçoba was emptied.43 A few of the deaths—such as that of an elder who, according to Anchieta, had “abandoned the faith” and consequently “lost the capacity to speak” even before he died—seemed to fit comfortably into the salvific explanatory framework they brought with them from the north. In São Vicente, that frame grew rickety. Death “came suddenly,” wrote the Jesuit Pero Correia. That was true for some of the most recalcitrant natives but still more so for the “men and women who were very good [Christians].” “The closer [the converts] got to God,” explained Anchieta, “the more likely they were to die.” Disease, it now seemed, fell most forcefully upon those who joined—and remained within—the missions.44

More than it had elsewhere, in São Vicente in the early 1550s death thwarted Amerindian conversion. That may have been especially frustrating in Piratininga and the other São Vicente missions. With the exception of the Crown captaincy of Bahia, São Vicente was the only captaincy that could lay claim both to prosperous sugar plantations

41 MB, II: 108.
43 MB, II: 209.
44 MB, III: 379-381.
and a strong Jesuit missionary presence. Those sugar plantations were only important locally and were all but irrelevant to the colony’s growing export sector. Pernambuco was the unrivalled producer at the time, with Bahia trailing a distant second. But in Pernambuco, the Jesuits had done little after the initial forays of Nóbrega and Pires among the Tobajara. By contrast, neighboring Bahia was the heart of the sixteenth century Jesuit enterprise. Their expanding mission field along the outskirts of Salvador had already earned them the ire of Bahian cane farmers. And just as Dom João III supported the Jesuits with various favors, so he also sought to promote cane farming in Bahia with a number of economic incentives. Hence the seeds of what would become a longstanding conflict that would pit Jesuits against cane farmers and colonial officials over access to Amerindian labor had begun to take root. If Nóbrega and his colleagues in São Vicente could mount a successful missionary campaign alongside a thriving sugar economy, it would demonstrate to the Jesuits’ detractors that they were not anathema to export agriculture. And that would be a powerful argument in favor of continued Crown support.

It was perhaps for this reason that—faced with the ineradicable problem of disease—the Jesuits grew at once more creative and more desperate in their plots to draw members of the Carijó into the orbit of their missions. Nóbrega and his Jesuit companions began to promise earthly riches to those who would join the mission. But that, of course, was a promise they could not fulfill. The combination of deceit, disease, and death led to the dissolution of trust between the Jesuits and at least some of the Carijó. They hatched a plot to exterminate a number of the missionaries including both Nóbrega and Anchieta.

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46 Across the late sixteenth century, both Nóbrega and Anchieta confronted this kind of opposition. See Hemming, *Red Gold*, 148-149.
But disease spread among the conspirators and when the time came to act, they had neither the numbers nor the strength to carry out their attack.\textsuperscript{47}

For Anchieta the foiled plot was a sign that his god—however displeased—remained on the side of the missionaries.\textsuperscript{48} But that such a thing might even have been open to question revealed just how threatening the issue of disease had become and just how pressing the need to win converts among Brazil’s native peoples now was.

When Pero Correia recorded the epidemic that swept into São Vicente and cleared the Piratininga missions, he offered no such certainty on the matter of divine favor. He did explain how he and other missionaries sought to manage the disease: the gathered in the village center to process nine consecutive times before “Our Father showed us mercy.”\textsuperscript{49}

Care for the sick and conciliatory baptism offered \textit{in extremis} gave way to rituals of contrition. Precisely why these illnesses continued to strike the missions, what the Jesuits could to do mitigate their damage, and how they were to continue the work of conversion—these were all thrown into question. But the idea that punitive death might somehow encourage recruits or enforce discipline among the newly converted was now difficult to sustain. In this context, Anchieta’s notion that a divine illness had been sent to silence a subversive elder appears as much a colonialist fantasy read willfully into the past by a reflective author as an extemporaneous interpretation of the manifestations of illness. If they did indeed doubt their ability to read illness, the Jesuits nevertheless believed in the rightness of their actions. Hindsight seemed to make clear the implications

\textsuperscript{47} MB, II: 222-223; MB, II: 340.
\textsuperscript{48} MB, III: 554-555.
\textsuperscript{49} MB, III: 555.
of the Piratininga debacle: in the matter of conversion “there is nothing better than a sword or [even] a rod of iron,” wrote Anchieta pointedly.\textsuperscript{50}

Back in Espírito Santo, Bras Lourenço read the news of the events in Piratininga in a letter from Pero Correia dated 18 July of 1554.\textsuperscript{51} It was perhaps for that reason that Lourenço enforced strict discipline in the Espírito Santo missions—a feature that was particularly striking to Jacóme and others when they arrived a decade later.\textsuperscript{52} Besides the severity of the Piratininga outbreak, Correia also took care to mention that one of his colleagues, Leonardo Nunez, was “still sick,” though he had left São Vicente for Salvador.\textsuperscript{53} On this point, Correia’s letter to Lourenço may have been something of a warning. The boat that carried Nunez northward would almost certainly have docked in Vitória—the Espírito Santo port city was larger and more secure than any between São Vicente and the capital. Indeed, it may have been Nunez himself who delivered Correia’s letter to Lourenço. And if that were the case, and if Nunez’s illness were communicable, then the inhabitants of the Espírito Santo missions narrowly escaped catastrophe. The epidemic in São Vicente did not follow Nunez northward.

Disease first struck the Espírito Santo missions four years later. The 1558 epidemic unfolded with all of the all-too-familiar indecipherability of divine intent. On this occasion, death took no more than six days to claim a life. It showed as little mercy to the women and children of the Tupi missions as for the men. And it had as little patience for the converted as for the unbelievers. With the help of an interpreter, Lourenço baptized as many victims as possible in extremis, though many others died

\textsuperscript{50} MB, III: 554.  
\textsuperscript{51} MB, II: 70-71.  
\textsuperscript{52} MB, IV: 265.  
\textsuperscript{53} MB, II: 65.
unconverted from what one young Jesuit—António de Sá—described as their own “stubbornness.” Baptism in extremis was by now a standard measure in the missions. In moments of epidemic calamity, Jesuit missionaries directed their efforts to that stopgap rite of initiation. Children taken ill were regularly converted that way. Lourenço and Sá resorted to the measure in Espírito Santo in 1558. And there as elsewhere, what was for the Jesuits a gesture of mercy was for many grieved Amerindian mothers an unwelcome advance. In many cases native women hid their children to keep them from the hands of men like Nóbrega, Anchieta, Correia, Lourenço and Sá. Women taken ill feared that, if they were to die, the Jesuits would steal their children and raise them as their own.55

This end-of-life battle between mothers and missionaries over the lives of their children was familiar to both Bras Lourenço and António de Sá. Lourenço’s experience with it was plain enough: he had been in Bahia with Vicente Rodrigues during the epidemic of 1552. Sá was there too but he arrived late. When the disease broke out, he had been in Pernambuco with Nóbrega and Pires. Indeed, at the time of the Bahia epidemic, Sá himself was a young orphan—one of a number of Portuguese boys sent to Salvador from Lisbon under the watchful eyes of Francisco Pires the year before, in 1550.56 Hence, when Pires accompanied Nóbrega to Pernambuco, the young Sá followed. He bore witness to the “general cough” that nearly led to the demise of the Tobajara girl. And it was by the sides of Nóbrega and Pires that he made it back to Bahia to help with

54 MB, III: 20.
55 They were right and Jesuits were open about this tactic in their correspondence. See for example the passages in MB, I: 387; and MB, II: 134.
56 All of this raises the question of the role of children in imperial expansion, conquest, and colonization. Where the Jesuits were concerned this topic appears to have been almost entirely neglected. For other cases see, Ondina E. González and Bianca Premo, eds., Raising an Empire: Children in Early Modern Iberia and Colonial Latin America (Albuquerque, NM: University of New Mexico Press, 2007).
the sick and dying in the missions surrounding the capital. Now in 1558, he was in Espírito Santo. How his own peculiar history and the accumulation of eight years’ experience on the frontline fight between faith and contagion might have shaped Sá’s outlook is impossible to know. Information contained in the Jesuit letters is too slim to say. But the 1558 epidemic left its mark in the form of a letter that Sá penned in February of the following year.

In the throes of death, a Tupi woman (Sá did not give her name) gave birth to a healthy baby boy. In agony but still clinging to her newborn son, the woman refused to let either Sá or Lourenço lay a hand on him. Neither would she allow baptism. And in her final, fleeting moment of life the unnamed woman turned to her son and explained, “your mother is about to die and you will be here alone, with no one to nurse you and no one to care for you; you must come with me.” Then she died. But her arms were still locked around her son. And just like that the two were buried, “the child alive and his mother dead, together in one coffin, buried and un-baptized.” Sá penned these lines in utter incomprehension of her calculus: “what animal is this?” That he took the unusual license of recalling and quoting the mother’s very words made this only the most vividly moment in a letter detailing an entire epidemic. But it was not the only scene he recorded. Indeed the letter consisted almost entirely of episodic depictions of death and desperation. Writing similar letters, most of the early Jesuits in Brazil tried to make sense of what they had seen—to interpret events from within a more or less shared religious idiom, much as they had done until now with disease. The several pages Sá managed to write were

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57 MB, III: 19.
59 This was a characteristic epistolary habit of many Jesuits. See the discussions in Cohen, Fire of Tongues; and O’Malley, The First Jesuits, 91-133.
marked by his near total refusal to do just that: interpret. Almost nowhere did he insist on the purposefulness—however unintelligible—of his god. It seems that, for an instant—in that letter—Sá abandoned the search for meaning. And yet, bereft of explanation, the young Jesuit could not stop himself from writing down what he had seen—even if he failed to understand it. The impulse was so strong that he finally excused himself for his compulsive literary reenactment: “because Our Father must draw good [from evil], I have to tell you [these things] so that all He does shall be praised.” But Sá left the praising to others.

Long on detail but short on interpretation, the entire missive resembled less a letter than a list. Where explanation failed, bare enumeration would have to suffice. As in faraway Malacca, the list was once again a way to navigate the ill-defined boundary between what was known and what was not (see Chapter 3 here). It was in Espírito Santo—less than a decade after they first came to the South American colonies—the cause of disease and its treatment were, to cite Costa again, utterly “indecipherable.” The letters of Sá in 1558 and Costa in 1564 were not the only ones to evince this uncertainty. They were only two of the most pointed.61

III

If the Jesuits equivocated, others did not. Pagés—medical specialists of both the Tupi and Guaraní peoples—countered Nóbrega, Anchieta, Sá, Costa and many others with explanations of their own for the ills that befell them. And pagés’ explanations of so much carnage and upheaval remained—a far as the Jesuit letters reveal—almost entirely

60 MB, III: 21.
61 See also the letter of Anchieta in MB, III: 367-382.
consistent. They believed the Jesuits to be the source of the illnesses. At times, as in Pernambuco, it was the chanting and singing of the Portuguese children who traveled with them. More often it was the practice of baptism itself: in the words of one missionary in Bahia in 1561, the fear “that baptism would cause death [is a] claim that the hechiceros [“witchdoctors”] have made since the coming of the Portuguese.” Tupi villagers on the outskirts of Bahia singled out particular Jesuits as the very embodiment of death. They were carefully avoided—and perhaps no one so much as Nóbrega. Even to his fellow Portuguese, Nóbrega presented a deathly visage: he was haggard, often dressed in rags, emaciated, constantly battling fever, and frequently coughing blood.

From both sides of what had become an epidemiological fault line, bodies and their healers were being read for what they might reveal about the curative powers of the adversary. For all parties, the implications of that interaction were far reaching. For the Jesuits, pagés were the embodiment of evil and trickery. The missionaries often sought to pin the blame on them for the outbreak of disease—an explanation made all the more appealing by the widespread belief among many Portuguese (missionary or not) that the Indians were weak of mind, short on resolve, and lacked spiritual discipline. But they could never make the charge stick. Many Amerindians, converted or not, rejected such singularly diabolical missionary imaginings. Especially in times of epidemic disease, the presence and influence of pagés among the Tupinambá and Carijó communities continued. Nóbrega and Anchieta were among many Jesuits who understood that the

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62 It may be possible to chart the destabilization of indigenous food production through the presence of the pagés who, as transfrontiersmen (they seem always to have been men), occasionally brought food to diseased communities evidently unable to supply themselves.
63 MB, III: 403.
64 MB, III: 376.
65 Hemming, Red Gold, 550. Metcalf and others have suggested that Nóbrega suffered from tuberculosis, which may have been the source of the “general cough” in Pernambuco.
authority of the pagés among Tupi and Guarani communities derived from their ability to predict the course of maladies posing an existential threat to community survival.\textsuperscript{66} Bras Lourenço attempted this kind of divination as he administered medicine to sick children in Espírito Santo in the 1550s. The results were mixed.\textsuperscript{67} The Jesuits could never have hoped to monopolize the art of prognostication; epidemic disease—inexplicable and unstoppable as it was—meant that pagés remained indispensable to Amerindian communities coping with it.

Still, Lourenço was not the last of the Jesuits to turn to divination and faith healing to buttress their work in the beleaguered missions. No Catholic missionary in Brazil had more success at that than José de Anchieta. Before he succeeded Nóbrega as Jesuit Provincial in Brazil, Anchieta became famous throughout the inland missions and coastal plantation society for his curative miracles.\textsuperscript{68} Healing through the combination of plant-derived medicines, the burning of capsicum pepper, and the recitation of hymns, prayers, and chants was a hallmark of both Anchieta and the pagés.\textsuperscript{69} Faith healing became a kind of language through which the fight for frontier medical primacy was waged.\textsuperscript{70} The missionaries, and perhaps the pagés too, understood it as an extension of the religious mission—a battle for bodies but also for souls. The timing of much of Anchieta’s faith healing coincided with the emergence of the santidades. One of largest 

\textsuperscript{66} MB, I: 49-53. But many of Nóbrega’s first letters detailed the activities of the pagés.
\textsuperscript{67} MB, II: 111-112.
\textsuperscript{68} This is the subject of Lopes Rodrigues, Anchieta e a Medicina (São Paulo: Editora Apollo, 1934), which ends with a catalog of Anchieta’s healing activities.
\textsuperscript{69} Alfred Metraux, A religião dos Tupinambás, translated by Estevão Pinto (São Paulo: Editora Nacional, 1950).
\textsuperscript{70} Drawing on an older literature on symbol and social protest, Hal Langfur has developed this very useful idea for the Brazilian frontier in The Forbidden Lands: Colonial Identity, Frontier Violence, and the Persistence of Brazil's Eastern Indians, 1750-1830 (Stanford: Stanford University Press, 2006).
and best known of these millenarian movements was the *santidade* of Jaguaripe, named for a district along the coast just south of Salvador, where its followers coalesced. The *santidades* have been interpreted as a rejection of either missionary demands or of the violence and coercion of the plantations. But the transcripts from the inquiry following the defeat of *santidade de Jaguaripe* indicated that the combined impact of disease and famine were core concerns of the *santidade*’s adherents. As much as the Jesuits insisted on the superiority of their faith, their evident inability to direct the forces of life and death counteracted the work of conversion. Faith healing was a way to mitigate not only the loss of life but also the erosion of Jesuit influence in the missions.

Dom João III supported the Jesuits in Brazil in part because they lent legitimacy to Portuguese colonization. But as Nóbrega and Anchieta well knew (and as I have discussed above) Crown support depended on results—on the stability and prosperity of the missions and, finally, on the success of the conversion effort itself. Disease endangered all of that. It was a source of deep anxiety. That the salvation of humanity should ever hinge on such unthinkable acts as the burial of a living, “innocent” newborn child at the whim of its “pertinacious” and ultimately dead mother was just one of the most troubling and yet quotidian experiences of life on the missions. But the letters in which heartache was permitted to provoke expressions of outright uncertainty were most

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72 Metcalf cites these in “Millenarian Slaves”; and she develops the link between famine and instability further in Metcalf, *Go-Betweens.*

73 These was precisely the grounds on which Jesuit and Guarani leaders sought to defend the Paraguay missions. See Barbara Ganson, *The Guarani under Spanish Rule* (Austin, TX: University of Texas Press, 2003).

74 This is not hyperbole. It was the project as the Jesuits and some Portuguese rulers conceived of it See Alden, *Making of and Enterprise*; and Cohen, *Fire of Tongues.*
often addressed either to Jesuits already in the mission field—in Bahia, Espírito Santo, or São Vicente—or to companions in the Jesuit houses in Portugal—in São Roque, Coimbra, Lisbon, or (later) Evora. When writing to Jesuit superiors Loyola or Laines in Rome, missives evinced greater confidence and optimism. In 1552 from Salvador, Rodriguez wrote of the crosses, cough, and death of a young girl in Pernambuco when addressing Jesuits in Coimbra. I have already pointed out that Correia’s vivid account of the São Vicente epidemic of 1554 was addressed to Bras Lourenço in Espírito Santo; Sá’s description of the woman and child in Espírito Santo in 1558 was addressed to his companions in Bahia. Costa’s 1565 remarked on the “indecipherable will of God” was direct only to his companions in São Roque. Exceptionally, Anchieta wrote of the continued troubles of Piratininga in 1560, 1561, and 1563 to Laines in Rome. But these were the annual letters wrote under Nóbrega’s direction. They stressed Jesuit deaths and were ultimately used by Anchieta to strengthen his argument for the use of force in the service of conversion. Anchieta, in other words, put news of trouble in the service of the expansion of power. Otherwise, personal doubt rarely circulated directly from the colonies to the final arbiters of Jesuit activity at the epicenter of Roman Catholicism. 75 The doubt and uncertainty inspired by disease was a carefully guarded secret. Epidemic disease was a disaster visible to all but the instability and uncertainty it engendered among the Jesuits themselves was not. Eruptions like the *santidade de Jaguaripe* threatened to make public precisely that which the Jesuits wanted to keep private.

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75 Ultimately, decisions about what to communicate to Rome and what not to were left to Jesuit superiors at the Society’s colleges in Portugal.
IV

Taken together, letters from the first generation of Jesuits in Brazil offered their readers a catalog of rather specific maladies: diarrhea (câmaras); bloody diarrhea (câmaras de sangue); pox (bexigas and sarampo); kidney pain (prioris); bloody and swollen gums (mal de Luanda); and tertian and quartan fevers.

These were the plagues of Portuguese America. At least one physician, Aleixo de Abreu believed that several of these illnesses might be reducible to a single humoral imbalance. And he thought that his tenure overseas combined with his own prolonged bought with some of these very maladies gave him the insight and authority needed to write and publish a volume about them. He was right—at least partly so. The Lisbon-born physician managed to have his book produced by an expert establishment of no less prestige than the royal printer himself, Peter van Craesbeeck. The Dutchman had, several years earlier, finished a run of books detailing the imaginary adventures of a crackpot knight, authored by an obscure Spanish nobleman and sometime prisoner by the name of Cervantes. Craesbeeck, it seems, was a printer willing to take a chance. And Abreu’s Tratado de las siete enfermedades, published in Lisbon in 1623, was a risky endeavor indeed. Given the growing concern for disease, its causes, and its cures in Brazil, the Tratado was book that might have commanded a readership at least as diverse as that for Orta’s Coloquios. And yet, despite a long list of notable patrons and supporters—among them D. M. Teixeira, the bishop of Brazil, and the Portuguese physicians Damião Viegas—there were no ready buyers for the Tratado. Abreu, who often complained of

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76 Abreu, Alexo de. Tratado de las siete enfermedades: de la inflammation universal del higado, zirbo, pyloron, y riñones, y de la obstrucion de la satiriasi, de la terciana y febre maligna, y passion hipocondriaca. Lleva otros tres tratados, del mal de Loanda, del guzano, y de las fuentes y sedales. Lisbon: Pedro Craesbeeck, 1623.
penury, paid out of his own shallow pockets for the publication of two hundred copies of the book. Publication did little to draw readers. The book’s circulation was limited: few copies of the Tratado travelled beyond the small Iberian kingdom in which it was printed. And yet, its short reach and slim appeal notwithstanding, Abreu’s Tratado had much in common with Orta’s Coloquios. It was a first attempt by a Portuguese physician to reckon systematically with the overseas commercial and epidemiological situation in which the author made his living. Indeed, like the Coloquios, the Tratado was a book at once necessitated and enabled by the networks of exchange created in whole or in part by Portugal’s empire, for its making required its author to venture distinctions that would have been both unnecessary and impossible beyond those circuits.

If in the Indian Ocean Garcia de Orta emphasized the plants, medicinal and otherwise, that underwrote imperial expansion, in the Atlantic, the situation was nearly the opposite. There one plant more than any other was the object of experimentation, investment, and seaborne commerce. And sugarcane—its transplantation, cultivation, harvest, and refinement—demanded massive inputs of manual labor.77 Focused as it was on the bodily manifestations of disease, Abreu’s book spoke to the centrality of the human body to Portugal’s Atlantic colonies. In the Tratado de las siete enfermedades—the “book on the seven illnesses,” Abreu attempted to identify what he thought were the seven most pernicious and poorly understood diseases threatening Portugal’s overseas endeavors. The book was not limited to the diseases thought to be pervasive in Portugal’s South American colonies but included as well illnesses associated with the Portuguese factory at Luanda, and those found metropolitan Lisbon itself. In medical terms the book

77 Schwartz, Sugar Plantations.
evinced something of a truly Atlantic perspective. In this, it reflected both Abreu’s own medical work and the concerns of the governors in whose service he traveled. And it was an overseas tenure with distinctly inauspicious beginnings.

Inexplicably—in a metropolitan capital with ties to medical outposts on three continents and faced with what many have claimed was a dramatic shortage of trained physicians—Abreu failed to find work in Lisbon. He decided to seek an appointment overseas. And for that he finally turned to his father, a friend of the Count of Merino, for help. What Abreu wanted was, as he put it, “to become rich, as all men desire to do.”

When he was finally offered the post of personal physician to João Furtado de Mendonça, the sixth governor of Angola (1594-1602), Abreu took it. That was how the son of a well-to-do Old Christian family with a newly minted medical degree from Coimbra (where he studied on scholarship) found his way to what was one of the least desirable spots on Portugal’s imperial map. Luanda—one of Portugal’s first overseas mission fields but otherwise little more than a way station for India-bound ships—attracted attention in the late sixteenth century for a number of reasons. Rumors of silver mines in the Luandan interior sparked early interest and led to the creation of a governorship there after 1570 (figure 5.3). It was a move taken by Dom Sebastião (r. 1557-1578) partly to counter the wealth that Spain now drew from mines at

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78 I say “something” because such a thing had not yet coalesced in cartographic terms in the spatial imagination of European empire builders. The “Atlantic World,” now so common, is something of an anachronism and threatens to cleave off what was, for the Portuguese at least, a vast theatre of activity that was, as I have argued at the front of this chapter, a point of orientation for Portuguese notions of Atlantic possibilities. See Joyce Chaplin’s essay in Jack P. Greene and Philip D. Morgan, eds., Atlantic History: A Critical Appraisal. New York: Oxford University Press, 2009.

79 Abreu, Tratado, [unnumbered page 11].

80 Even the Jesuits, eager to establish themselves in leadership roles abroad, hesitated to go: Alden, The Making of an Enterprise.
Zacatecas and Potosí. Meanwhile, a series of dynastic wars eventually involving the Portuguese helped give Luanda easy access to captives taken in war and reduced to slavery.⁸¹ And with the expansion of sugar plantations in Brazil, the often-inexplicable loss of Amerindian life there, and the simultaneous growth in demand for labor, Luanda’s

were by the 1590s among the most heavily trafficked slave markets in the transatlantic trade.\textsuperscript{82}

When in 1580 Portugal and its empire became part of the Spanish Hapsburg domain, Philip II took a keen interest in streamlining and strengthening that traffic—on both sides of the Atlantic. Faced with a half-century of epidemiological catastrophe in Brazil and a total failure to find the fabled silver mines, Philip turned to one Domingos de Abreu e Brito for a report and recommendations on his newly won Atlantic interests. Brito’s \textit{Inquerito à vida administrativo e economica de Angola e do Brasil} (“Inquiry into the administration and economy of Angola and Brazil”) appeared in 1592—shortly before Mendonça and Abreu left Lisbon for Luanda.\textsuperscript{83} Brito had argued that plantation agriculture be extended to the Luandan hinterland from the island of São Tomé, just as it had been to Brazil from Madeira earlier. He argued that ready access to slaves at Luanda made his plan both feasible and prudent. But the key, thought Brito, to making Angola a profitable venture still lay in the search for those elusive mines. João Furtado de Mendonça, with the physician Abreu in tow, partly followed Brito’s recommendations. Once in Luanda in 1594, Mendonça took measures to strengthen the transatlantic slave trade (including a series of wars to that end) and commissioned a hospital (run by Abreu) to care for the growing number of sailors then coming to Luanda. Mendonça ignored the mines. Under his governorship, enslavement and the slave trade took precedence over

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\textsuperscript{83} Domingos Abreu e Brito, \textit{Inquerito à vida administrativo e economica de Angola e do Brasil} (Coimbra: Imprensa da Universidade, 1933 [1592]).
\end{footnotesize}
inland conquest in pursuit of the elusive metal. Luanda’s increasing emphasis on slave trading quickened. When Mendonça’s successor resumed the mineral search and in 1605 finally managed to reach the Cambambe Hills, where the mines were supposed to be, he found exactly nothing—no silver whatsoever. After 1605 Luanda was principally a slave port for buyers on the far side of the sea.

By that time, Abreu had crossed the Atlantic. Precisely how he got the appointment to Diogo de Botelho, Brazil’s incoming governor (1602-1605), is unclear. Abreu arrived to Portuguese America directly from Luanda and would not return to Portugal for a few years yet. Had Abreu established a reputation that made its way back to Lisbon even while he was in Angola? Had Botelho heard of Abreu’s work among the slaves and sailors moving in and out of Luanda? The only biographical information on Abreu was what the doctor himself wrote in the preface to the Tratado and Abreu answered none of these questions. What is clear is that Botelho had Mendonça’s interest in slave labor and shared Abreu’s claims to penury. He would later defend himself against accusations of gubernatorial corruption by insisting that all he wanted for himself in Brazil was merely “to earn a living, for the colony is very expensive.”

Botelho, much like Sousa in Goa some six decades earlier, was an unusually controversial figure. He was the first in a string of governors that Stuart Schwartz described as having a “military cast.” Faced with increased threats from the Dutch (owing to the empire’s inclusion in the Hapsburg domain), the attention of Botelho and his

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84 For the nuts and bolts of Portuguese policy, I have relied on David Birmingham, Trade and Conflict in Angola: the Mbundu and their Neighbors under the Influence of the Portuguese, 1483-1790 (Oxford: Clarendon Press, 1966).
85 Schwartz, Sovereignty and Soceity, 192.
successors was turned “toward defense and conquest,” and personal enrichment.\textsuperscript{86} His very arrival in Brazil was marked by scandal. When he left Lisbon for the South American colonies, Botelho headed not for the capital of Salvador but, in a move that earned him censure from the Crown, went straight to Pernambuco. That captaincy remained the wealthiest sugar-producer of Portugal’s American colonies. But at the time, his connections with the local treasurer, temporary donatary absence, and the still-meager Jesuit missionary presence gave Botelho unmitigated access to slaves—both newly subjugated Amerindians from the interior (where wars of conquest were on the rise) and to Africans newly arrived from Luanda. Because of the captaincy’s productivity, labor costs were high and Botelho made the most of his Pernambuco detour: it earned him, among other things, charges of price fixing and of interfering in public auctions.\textsuperscript{87} Under Botelho, conflict with the Jesuits came to head too—over what was by now the missionaries’ near-monopoly on access to Amerindian labor.\textsuperscript{88} The governor wanted to put the missions into the hands of the secular clergy and loosen the restrictions on Amerindian enslavement. Jesuit faculty in the coastal colleges at Olinda and Salvador mounted a defense of Jesuit policy. They claimed that that colonists wrongly enslaved the natives and that secular clergy and officials like Botelho failed to protect both native communities and Jesuit mission villages from planter depredations.\textsuperscript{89} In their charges on

\textsuperscript{86} Schwartz, \textit{Sovereignty and Society}, 193.


\textsuperscript{88} See the chapter on the Society of Jesus in Metcalf, \textit{Go-Betweens}.

\textsuperscript{89} To make matters worse—in an episode that evinced Botelho’s similarly antagonistic stance toward the secular clergy and which reflected the growing conflict between secular and ecclesiastical influence in the colony—the governor was embroiled in a protracted struggle with the local bishop over the order of procession on feast days. See Stuart B. Schwartz, “The King’s Processions: Municipal and Royal Authority and the Hierarchies of Power in Colonial Salvador,” \textit{Portuguese Colonial Cities in the Early Modern World}, edited by Liam Matthew Brockey
the issue, the Jesuits repeatedly cited the mistreatment, ill-health, and death that was sure to befall the enslaved workers in cane fields and at the mills.\textsuperscript{90}

Even as control over labor had become perhaps \textit{the} principal issue of contention pitting Jesuit missionaries against just about everyone else, all sides—as I have already argued—recognized the debilitating and often deadly effects of disease. Illness not only threatened everyone by endangering their health, it increased labor costs,\textsuperscript{91} and laid both missionaries and planters open to accusations of mistreatment and neglect.\textsuperscript{92} Anyone in any of Portugal’s coastal enclaves on either side of the South Atlantic had an interest in solving the puzzle of disease. What were the most pervasive and deadliest illnesses facing in the Atlantic colonies? Who was most at risk and why? And how could they be treated? Abreu’s eight years in Luanda and his three years split between Pernambuco and Bahia exposed him to the kinds of afflictions thought to affect not only the enslaved but anyone anywhere throughout this vast transatlantic theatre of activity.

\textbf{V}

The \textit{Tratado} was self-consciously didactic. Abreu wrote it as a guidebook. Part field manual (in Spanish), part learned treatise (in Latin), he addressed it to the two groups most in need of it and best able to use it: untrained but literate laypersons needing to sort out diseases and treat them on their own—Jesuits, slave traders, \textit{senhores de engenho}—

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(Burlington, VT: Ashgate, 2008).
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\textsuperscript{90} Hemming, \textit{Red Gold}, 148-149. I have addressed important complexities in this debate in Hugh Glenn Cagle, “The Making of an Atlantic World Order: Jesuits, Just War, and Racial Hierarchy in Colonial Brazil” (MA Thesis, Center of Latin American Studies, University of Kansas, 2005).
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\textsuperscript{91} I have not explored this in any length here because Joe Miller has already done so at great length in \textit{Way of Death: Merchant Capitalism and the Angolan Slave Trade, 1730-1830} (Madison, WI: University of Wisconsin Press, 19XX), especially 418-425.
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\textsuperscript{92} Hemming, \textit{Red Gold}, 148-149.
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and university trained physicians eager to learn what one of Abreu’s supporters described as “things of medicine very particular and necessary to avoid the gravest illnesses that are commonly found in the human bodies, for which he ingeniously and learnedly suggests many particularities and curiosities not commonly unknown [vulgares].”\textsuperscript{93} Since Portugal and its empire was formally part of the Spanish Hapsburg domain, the latter audience included a growing number of Spanish imperial officials and colonists deeply concerned about the nature and cause of diseases throughout the broader Iberian world.\textsuperscript{94} Abreu delivered. In five hundred pages of printed text, Abreu enumerated with approximate precision, seven distinct infirmities. He announced them, in order, in the book’s subtitle: “De la inflamacion universal del Higado, Zirbo, Pyloron, y Riñones, y de la obstrucion, de la Satiriasi, de la Terciana y febre maligna, y passion Hipocondriaca.”\textsuperscript{95} In translation this might amount to:

1) the “universal” inflammation of the liver
2) the inflammation of the kidneys
3) an obstruction
4) satyriasis
5) tertian fever
6) malignant fever
7) hypochondria

Yet two of these, Abreu claimed, were varying manifestations of tertian fever. A third kind of tertian fever was too, and linked to an illness Abreu called “mal del guzano” (literally disease of the worm), which he discussed separately. So as Abreu understood it, there were three kinds of tertian fever (though, as I discuss below, he was not entirely

\textsuperscript{93} Abreu, \textit{Tratado}, [unnumbered page 3].
\textsuperscript{94} Canizares-Esguerra, \textit{Nature, Empire, and Nation}, 64-95. These ostensibly included both the \textit{Estado da Índia} and Spanish settlements in the Philippines and Moluccas but the inquires and much of the debate appears to have concerned the Atlantic. And this raises the question of the degree to which the “tropics,” in a medical sense, had any meaning at all.
\textsuperscript{95} Abreu, \textit{Tratado}, [unnumbered page 1].
consistent on this point). One was tied to an inflammation of the liver; another to a second, “malignant” (here meaning slight but worsening) fever; and a third related to mal del guzano. Hence it was in the Tratado, that the source of general confusion among everyone from shipboard merchants to colonial missionaries became the object of concerted investigation.

Abreu was convinced that each of these tertian fevers represented a distinct transformation of what was originally a single humoral imbalance—a corruption of the bile located principally in the liver and “its neighboring parts.”\textsuperscript{96} In the course of treatment—and, as Abreu was wont to point out on several occasions, especially when treated improperly—the original illness could produce successive imbalances, each representing a material change in the illness itself. Hence from a single illness could come many, some of which were these tertian fevers. But the fevers were not the only possible pathological outcomes. The initial imbalance could also undergo a “transmutation”—to use Abreu’s preferred term\textsuperscript{97}—and turn into at least three other diseases that were not fevers. And like the distinctive tertian fevers, each of these three additional diseases—satyriasis (an uncontrollable yearning for sex), malignant fever (which, again, is slight and constant but gets progressively worse) and hypochondria (a deep and lasting melancholy)—required separate treatment. With all of these, Abreu was able to account for the distinct ailments reported by settlers and officials on both sides of the Atlantic. What were several diseases were made intelligible, in Abreu’s work, by their shared common disease of origin: inflammation of the liver. And the proper treatment of that initiating disease could preclude the development of these other

\textsuperscript{96} Abreu, Tratado, 17.
\textsuperscript{97} He repeated it often. See for example Abreu, Tratado, 23, 88v, 90, 91v, 116v, 234, 388, 450v.
infirmities. Conversely, poor treatment would allow it to ramify. The proliferation of febrile and other infirmities, characterized by an array of physical, mental, and emotional manifestations, was the worst possible outcome and—in the case two of the tertian fevers (that called simply “tertian” and tied the malignant fever, and that inked to mal del guzano)—would lead almost certainly to death. Outlasting any of these maladies—and, by extension, surviving in Portugal’s Atlantic colonies—meant identifying the disease and matching it with its remedy. Abreu’s readers were to learn how to identify the former and concoct the latter.

Observational discipline was the surest way out of the epidemiological morass. Only with the proper signs read and evaluated at appropriate intervals could the most effective remedy be put to good use. For that reason, in a medical sense, Abreu taught his readers to see what they otherwise could not: the invisible. He laid out the most important indices of humoral activity up front: the pulse, stools, urine, sleep and dreams. A direct somatic engagement with these—when considered together, not in isolation—would allow even the uninitiated young missionary to envision and interpret the inner-workings of the body, which were not themselves susceptible to direct experience. And that, in turn, would allow the field worker or the physician to properly treat the illness at hand. To support this kind of “reading” (my word, not Abreu’s), the doctor offered a discussion of the internal organs of the body’s central cavity. And in a metaphor that serves as a reminder of the kind of gendered milieu in which medicine was taught, learned, and practiced (even, as I argued earlier, as far afield as colonial Goa), Abreu explained why it was that he referred to the initial infirmity as an “inflammation of the liver,” even as he

98 Abreu, Tratado, [unnumbered page 19].
explained at length that the principal humoral imbalance shifted between the liver, kidneys, and stomach:

As it is common among learned men when in the house of someone taken ill, be that person one of the children or the wife or any other person living therein, although the man of the house be not taken ill, it is said for that reason [his being the head of the household] that it is he who is taken ill, then so too with infirmities: because just as the man is the principal of the home, when the neighboring parts of the liver are affected, whatever they may be, it is called the inflammation of the liver.99

Patriarchy, it seems, had a knack for investing even the body with an intelligible order. The most invisible and unseen recesses—though rank and fetid—were susceptible to its metaphor.100 Ideas of household order helped make medical sense of the body.

But that was not enough. The external signs of internal bodily activity had to be accumulated and collated. Especially for a disease that might undertake an endless series of permutations (Abreu, after all, never claimed to have exhausted all possible outcomes), momentary measures of humoral imbalance were simply inadequate. What the physician needed was an elaboration of humoral change across roughly standard measures of time. Most of the Tratado was given over to a lengthy case study of the original disease and its successive transformations—from liver inflammation (inflamacion del higado), to excessive sexual excitation (satiriasi), and finally deep depression (hypochondria)—all carefully noted. Throughout, Abreu modeled the kind of observational discipline and interpretive prudence he thought necessary to discern the transformation of one sickness into another. He kept a record of daily assessments that included both the day’s date and the total number of days since the onset of a given illness. He noted in particular those

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days when symptoms (“accidents”) grew more or less sever, more or less erratic. Based on these he built his argument for the development of distinct diseases and drew distinctions between them. In this way, the Tratado taught its readers how to envision and interpret the body, read its effluvia and excrescences, distinguish between maladies, and determine the moments in which they were transformed.

Abreu packed the Tratado with medicinal recipes for what seemed to him to be every conceivable eventuality. Limiting his recommendations to only the recipes that were, in his words, “most effective as judged by my own experience,” he nevertheless drew on an imperial pharmacopoeia that bore all of the signs of the Asian trade that helped produce it. The Tratado was a veritable index of the extent to which the naturalia featured in Orta’s Coloquios found their way into a curative repertoire shared by Lisbon, Luanda, and Salvador. His recipes required cinnamon, rhubarb, neem, cardamom, “Malabar leaf” (betel?), opium, red and white sandal, “esquinanthurus,” tamarind, and aloes.

Yet, even after so much disciplined observation of his own, Abreu harbored severe doubts about the distinctions he had drawn. From front to back, the Tratado was marked by the inescapable tension between Abreu’s effort to explore the development and interrelationship of unfamiliar diseases—which was inherently speculative—and the book’s self-consciously didactic aim, which demanded that Abreu draw firm conclusions about the identity of distinct illnesses. That tension affected the very architecture of the book and manifested itself on the opening page (figure 5.4). In the Tratado de las siete enfermedades, the author seemed to promise his readers precisely that—a treatise on

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101 I discuss these in the conclusion.
102 Abreu, Tratado, 47, 78-78v. Tamarind was actually of sub-Saharan African provenance, but that was not the authoritative opinion of the time.
seven illnesses. And, again, the title itself appeared to articulate precisely which
infirmities were under discussion:

1) the “universal” inflammation of the liver
2) the inflammation of the kidneys
3) an obstruction
4) satyriasis
5) tertian fever
6) malignant fever
7) hypochondria

But the grammar and syntax in the original title is utterly enigmatic. How these were to be counted was anything but certain. So confounding were the title and text that one nineteenth-century Spanish reader finally dismissed the whole thing as, “gibberish.”

And although I have here divided it in such a way as to render seven plausibly distinct illnesses, these are not the divisions that Abreu drew within the text itself. He argued that liver and kidney inflammations were part of a single malady and treated the nondescript “obstruction” as one of a number of factors leading to satyriasis. He said almost nothing at all of the tertian fever that accompanied the initial inflammation of the liver (the exception being a single stray comment about day forty-two). Unsure of whether or not the tertian and (constant) malignant fevers were in fact distinct infirmities (Could a patient really suffer from two fevers simultaneously?), Abreu included them together in a single chapter and offered the same recipes for their treatment.

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Where the author was surer of his findings—as with hypochondria and a disease he termed in the subtitle “mal de Loanda”—he assigned individual maladies their own self-contained chapter. But with most illnesses the chapters overlapped and discussions of an ostensibly single ailment were split. So, to take another example, the tertian fever

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104 Abreu, *Tratado*, 201-213v.
he thought provoked the development of small worms in the rectal cavity—*mal del guzano*—was treated both as a possible transformation of the original liver inflammation (in chapter one) and as a separate illness (in chapter 8). Whereas in the earlier mention he argued for their interconnection and referred readers to the latter section, when he finally took up the discussion in the latter section he did so without any reference at all to the originating illness or the tertian fever. Accounts of maladies that Abreu had claimed to have circumvented in his main case study but which he claimed to have treated with varying success on other occasions—the malignant fever and satyriasis—were interspersed throughout the text.

Precisely where many of these illness were located was no less a matter of uncertainty. That metaphor equating the liver with the head of a household only served to elide Abreu’s evident confusion about which organ might actually house the inflammation. To buttress his claim that a clearer distinction was inessential, he launched into a lengthy discussion of why that was so. He concluded—in concurrence with Galen—that “so many distinctions are not pertinent.”

Fraught with syntactic confusion and semantic chaos, the *Tratado* continued to be a source of debate for centuries. Most recently, the pages of the *Journal of Tropical Medicine and Hygiene* were the site of a bid to clarify Abreu’s work and refurbish his reputation. Francisco Guerra wanted to remind readers that Abreu was the author of “the earliest book on tropical medicine describing amoebiasis, malaria, typhoid fever, scurvy, yellow fever, dracontiasis, trichuriasis, and tungiasis.” Guerra made the convincing case that Abreu had indeed—and however unknowingly—described each of these

106 Guerra, “Aleixo de Abreu.”
pathogens in disparate passages scattered throughout the *Tratado*. What remained elusive even in Guerra’s analysis was a precise enumeration of the seven illnesses that Abreu himself thought he had described.\(^ {107}\) Indeed, Guerra dismissed even the attempt, “. . .” That probably would not have surprised Abreu himself. Even by the author’s own admission, the product of his effort was less than convincing. He opened the *Tratado* with an almost apologetic discussion of the “difficulties of writing a book.”\(^ {108}\) Even great minds failed he reminded his readers: “Homer, too, occasionally fell asleep.”\(^ {109}\) Deeply aware that his evident confusion laid the *Tratado* open to sharp criticism or, worse still, outright dismissal. Abreu outfitted his treatise with a lengthy discussion on the proper conduct of physicians when faced with such uncertainty and divided in opinion. It was to remain a guarded secret—something that was best kept between specialists and beyond the view of the patient. If uncertainty were inherent in the speculative investigation of unfamiliar maladies it was nevertheless dangerous.\(^ {110}\)

That was a lesson of which, by the fall of 1623—when the *Tratado* sat printed ready for purchase on Abreu’s shelf—colonial governors, missionaries, merchants, and planters were now painfully aware. How many of them ever actually thumbed through a copy of the *Tratado* remained, like the diseases it discussed, a matter of considerable speculation. Abreu’s tentative exercise in disease taxonomy was printed under tight restriction. In that era when Portugal and its empire were under the authority of the Spanish Crown, Abreu was able to secure only limited permission from Spain’s Philip IV for the book’s publication. Although he had written it largely in Spanish (indicating,  

\(^ {107}\) Guerra’s list all but ignored Abreu’s articulation of the seven maladies on the title page, as Guerra’s own title suggested.  
\(^ {108}\) Abreu, *Tratado*, [unnumbered pages 8-20].  
\(^ {109}\) Abreu, *Tratado*, [unnumbered page 13].  
arguably, his intention for wide distribution), Philip IV explicitly forbade Abreu from circulating the *Tratado* beyond metropolitan Portugal. Whether or not the book made its way to Portugal’s colonies is an open question. But the license (*alvará*) for publication clearly stipulated that Abreu’s book was not to be distributed in Spain or its colonies.

Why? The problem was not what Abreu had written; it was what Spanish imperial officials read. By the early 1620s, Philip IV, his ministers, and a coterie of influential metropolitan physicians found themselves in a crossfire of invective about New World nature and its influence on the minds and bodies of the Spanish colonists.¹¹¹ In the early sixteenth century, as Portuguese officials capitalized on the Asian trade and read with only subdued enthusiasm the reports of an unknown land on the western edge of a southern sea, Spanish soldiers of fortune were extending Castile’s reach across the Caribbean and into the lands of the Aztec and Inca empires. By the time Tomé de Sousa stepped ashore in Salvador in 1549, a generation of Spanish thinkers had begun—as Orta had in Goa—to construct their own natural histories of the new places they now inhabited. As the writing of natural history developed in the Spanish colonies, the once-glowing accounts of the peoples and profuse of nature the New World gave way to a far more negative body of opinion. Scaliger’s comments on Brazil were part of that movement—one that often denigrated New World nature and demonized Native American peoples. In the Spanish colonies, the more densely settled native populations, Spaniards’ earlier and more extensive settlement, and the early importation of the institutions of Spanish education and governance, produced a generation of Creoles and

culturally Hispanic *mestizos* that soon found themselves excluded from the highest posts of colonial government.\(^\text{112}\)

These late-sixteenth century natural histories of the Spanish colonies did considerable ideological work: they legitimized the exclusion of Creoles and *mestizos* in favor of *peninsulares*, their prerogatives, and their privilege. They asserted, essentially, that the nature of the New World corrupted the minds and bodies of all who lived there.\(^\text{113}\) They were unfit for imperial service. Spanish Creoles shot back. By the turn of the seventeenth century, a generation of Creole intellectuals had taken up Biblical myth and the language and explanatory framework of Hippocratic-Galenic medicine to refute the claims of peninsular authors. Their aims were no less exclusionary: they argued that Native American minds and bodies were not corrupted by environmental factors—the climate and southern stars—but that they were *inherently* inferior to those of the Spaniards. Creoles fashioned their own patriotic brand of natural history that asserted that when Spaniards ventured southward into the colonies the environment improved upon their bodies and minds. Creoles—those of peninsular parentage in the colonies—were the beneficiaries of these environmental influences. In effect, they buttressed their own arguments for their own inclusion in both colonial *and* metropolitan religious and political institutions at the expense of all persons of the inherently inferior African and Amerindian descent.

\(^{112}\) A similar process was later under way in Brazil. See Laura de Mello e Souza, *The Devil and the Land of the Holy Cross: Witchcraft, Slavery, and Popular Religion in Colonial Brazil* (Austin, TX: University of Texas Press and the Teresa Lozano Long Institute of Latin American Studies, 2003).

\(^{113}\) In addition to Cañizares Esguerra, *Nature, Nation, and Empire*, 64-95; see Rebecca Earle, “‘If You Eat Their Food . . .’: Diets and Bodies in Early Colonial Spanish America,” *American Historical Review* 3 (2010): 688-713.
By the 1620s, this debate had taken definite shape. Positions were clear-cut. Differences were sharp. And the stakes were high. Colonial authorities in both Mexico City and Lima found the urban under classes ill-disposed to accept the racial divisions proffered by their self-proclaimed superiors. The publication of Abreu’s inquiry into disease came now. And it was an affront to all parties. His conclusion that the entire Atlantic was single epidemiological field was the very basis for his main case study. And the subject of that study of the manifestation and transformation of disease was none other than himself. The problem was that the proposition that a single body was susceptible to all diseases depending only upon location collapsed the distance and distinctions that Creoles wanted to draw between Iberian bodies and minds, and those of all other peoples in the colonies. Regions were different, to be sure, suggested Abreu, but they were not so distinct as peninsular intellectuals wanted to claim. Malignant and tertian fevers, the mal de guzano, and the mal de Luanda occurred more frequently in some places, yes, but the difference was frequency and nothing more.

For all this, it seems that Guerra’s essay in the Journal of Tropical Medicine and Hygiene was wrong in one very substantial way. Abreu’s treatise was not so much a founding text of “tropical medicine,” as was a rejection of the idea of “the tropics” itself. As the story of Abreu’s Tratado suggests, notions like “the tropics” and “tropical medicine” (along with its diseases) were often as much artifacts of imperial ambitions and colonial power as they were statements of conditions on the ground.

Three fingers with pen in hand is the boldest of human ventures. How many sins are embellished by a pen’s flourish? How many virtues obscured by a stroke? How much fame darkened by a blot?

— António Vieira (Source unknown)

Institutions mattered. In Goa, explicit rules and implicit expectations about the internal order of the household helped pattern Orta’s collection of *materia medica*. And they determined for him how he was to represent in print his interactions with diverse collaborators and correspondents from throughout Indian Ocean Asia. Along the Brazilian coast, the Jesuit enterprise that emphasized Amerindian settlement into mission villages framed the interpretations of disease offered by Correia, Rodrigues, Anchieta, and many other missionaries. As experience on the ground failed to meet their expectations, Jesuits like Sá and Costa grew far more circumspect about their own ability to mitigate the loss of life in the missions and to explain why it was that not only Tupi, Guarani, Carijó, and other converts died, but why Jesuits themselves so often did too.

Like a range of makeshift population policies (see Chapter 1 here), medical institutions for the care of Portuguese taken ill at sea were a way for Portuguese rulers to

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1 I have never been able to find the source of this quote and know of it only through Stuart B. Schwartz, *Sovereignty and Society in Colonial Brazil: the High Court of Bahia and its Judges, 1609-1751* (Berkeley, CA: University of California Press), xiii.
try to stem the loss of life in their overseas dominions. And while a great deal has already been written about the importance of institutional settings for the production of natural knowledge, the same cannot be said for the apparent institutional oddity of Portugal’s empire. Hospitals and makeshift clinics came into being throughout the empire. A growing epistolary traffic linked them to one another and to the Casa da Índia. And, as the 1512 letter of Tomé Pires to Dom Manuel and the 1623 book of Aleixo de Abreu to an unsympathetic audience both seem to suggest, that whole network channeled materia medica—but not necessarily knowledge about disease—throughout the empire.\(^2\) In this, Portugal’s medical infrastructure paralleled that of the Spanish.

The similarities ended there. Studies of Spain’s imperial medical infrastructure demonstrate time and again that the Casa de Contratación and the Consello de Indias served as centers of accumulation and calculation, and helped manage imperial medical affairs. The picture that emerges from an investigation of Lisbon and its colonies, however, is rather different. Reports about disease, medicine, and nature overseas circulated, yes; but there is no evidence to suggest that Portugal had, like Spain, attempted to centralize the accumulation of natural knowledge, to discipline the process of reporting, to generate consistency in the kinds of things reported, or to systematically compare the letters and lists that found their way to the Casa da Índia. Neither Dom João II nor his successors appear to have created Portuguese analogues to the Casa or the Consello, or to have standardized and circulated questionnaires like the relaciones geográficas. The highly decentralized and even diffuse character of the production and circulation of natural knowledge in Portugal’s empire was perhaps one of its

\(^2\) Timothy Walker (for the later period) at the University of Massachusetts—Dartmouth and Isabel dos Guimarães Sá and Elisabet Rodrigues (for the earlier period) at the Universidade de Porto are currently tracing out the movement of medicines and their shifting volumes.
distinguishing features.\textsuperscript{3} If in the work of Cañizares and the school of Iberian science studies that his work has helped generate, Spanish physicians in the America’s fit the description that David Arnold gave to British physicians in India in the nineteenth century—that “they were state servants as much as they were scientists”—the same could not be said of either Orta or Abreu.\textsuperscript{4} They worked within no overarching formal imperial administrative medical umbrella; Orta could be said to have worked for Martim Afonso de Sousa much more than for Dom João III. And Abreu’s work was shaped in the first instance by his own ailments and the transatlantic interests of Mendonça and Botelho. Orta’s connection with the Royal Hospital in Goa was tenuous; Abreu’s link to the one in Luanda was only temporary and there is no evidence that he had any affiliation whatsoever with the one in Bahia.\textsuperscript{5} And in Abreu’s work, Philip III was, at best, uninterested; from the point of view of the imperial state centered in Lisbon, Abreu’s book was a non-starter and was summarily dismissed.

\section*{II}

At the end of the seventeenth century, far up the Amazon and somewhere between two of its tributaries, the Tapajós and lower Madeira, a Jesuit by the name João Felipe Betendorf found his way into a group of Amerindian villages inhabited by a people he referred to as the “Andirazes” (now known as the Sateré-Maué). Among them he observed the use of a

\textsuperscript{3} This distinction may not necessarily hold true for other facets of administration. Benton has suggested that all of the major early modern imperial powers shared similar bureaucratic and military apparatuses in \textit{Search for Sovereignty}.


\textsuperscript{5} A. J. R. Russell-Wood, \textit{Fidalgos and Philanthropists: The Santa Casa de Misericôrdia of Bahia, 1550-1755} (Berkeley, CA: University of California Press, 1968), explains that hospitals in Bahia were off to a late start.
kind of fruit he had never seen before. The fruit, one of the villagers explained to him, “grew from the eyes of a murdered child.” Betendorf recorded the story without comment. And he took careful note of what the Andirazes said of the fruit’s properties: they claimed it gave them “so much energy that when hunting they could go from one day to the next without feeling [the pain of] hunger.” It was used to treat “fevers” and “cure headaches.” And it had the curious tendency to provoke the need to urinate—a property to which, Betendorf conceded, “I can personally attest.”

That fruit, guaraná, found its way into use against fever, headache, and acute diarrhea throughout the Jesuits’ Amazonian mission field. By the opening of the eighteenth century, guaraná was common in apothecary shops all along coastal Brazil. Whereas in the sixteenth century Jesuit missions spread southward along the Atlantic coast, in the seventeenth century they spread westward into the Amazon basin. Betendorf may or may not have been the first Jesuit missionary to make his way among the Andirazes but he was certainly not the last. Under the leadership of António Vieira, the region of Grão Pará and the Maranhão became the heart of the Portuguese Jesuit missionary enterprise. And their Amazonian missions, as the story of guaraná exemplifies, served as an immense bio-prospecting network that funneled materia medica and knowledge about them first from indigenous communities into the missions and then into the Society’s urban hospitals and coastal colleges.

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7 Guaraná is of course now a very popular ingredient in carbonated and other fruit drinks throughout Brazil. It has the highest caffeine content of any known plant. This claim and a brief discussion of the fruits introduction into the industrial food chain can be found in Nigel Smith and André Luiz Atroch, “Guaraná’s Journey from Regional Tonic to Aphrodisiac and Global Energy Drink,” *e-Journal of Complementary and Alternative Medicine* (2007): 1-4.

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Out of those hospitals the Society of Jesus carried on a lucrative trade. The cornerstone of this trade was by the middle of the eighteenth century was called *triaga Brasilica*—“Brazilian theriac.” Theriac was a mythical, multipurpose antidote known from antiquity. The profusion of unfamiliar but powerful plants of the colonial interior had given the Jesuits the idea to reinvent it and to make it better. The missionaries themselves and the Portuguese colonists believed, in fact, that the Jesuits had managed to do just that. And their clients probably paid dearly to get it. The recipe itself would have remained a carefully guarded secret. But in 1758, the Marquis of Pombal famously began the expulsion of the Jesuits from Portugal and all of its overseas colonies. Months later, in a cluttered chamber of the abandoned Jesuit college of Bahia, the recipe for *triaga Brasilica* was recovered. It made its way to Lisbon, where it was auctioned off to the highest bidder.

The story of the making of Brazilian theriac reflects something of the history of medicine and natural history throughout Portugal’s empire in the fifteenth and sixteenth centuries. Michael Pearson, referring again to the work of David Arnold, argued that while the British remained tolerant of South Asian forms of medicine until the middle of the nineteenth century, the Portuguese physicians were much less so. They exercised their own empirical sensibilities in ways that set them over and above their learned Asian

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10 I have not found direct evidence for the pricing of this theriac. The claim here is derived from the evidence of Alden, *Making of an Enterprise*, who suggests that despite their apparent splendor, the Society in Brazil was often strapped for cash. With such an enigmatic and debilitating disease environment was they found themselves in, it is difficult to imagine that they would not have capitalized on the demand for such a legendary medicine.
11 There is an extensive debate on why. See Magnus Mörner, *The Expulsion of the Jesuits from Latin America* (New York: Knopf, 1965).
12 Serafim Leite tells the story in *Artes e Oficios*. 
counterparts. This was, to use Pearson’s expression, the “thin end of the wedge” that gave the Portuguese and subsequent Europeans a primary and decisive advantage over not only South Asians but all non-Western peoples. 13 What the case studies here of South Asia and South America, and, indeed, the initial West African exchanges all suggest is something different. Whatever advantages Western imperial powers enjoyed on the colonial stage as a result of subsequent scientific and technological changes, there was—at least in the Portuguese case—no easy, linear, progressive development of practical, technical, or epistemological advantage.

Instead, what unfolded were series of what I will call cycles of collaboration and appropriation. Encounters and exchanges remained fluid until pressures arising from the colonial drive increased tensions between medical communities, penalizing collaboration persecuting collaborators, and driving the production of natural knowledge out of sight (Orta’s impenetrable household; Abreu’s disappearing book). But that did not mean such exchanges disappeared or that they would not re-emerge.

European newcomers struggling to comprehend the epidemiological landscapes that confronted them, turned readily to the peoples they were among. In Goa, Portuguese reliance on healers throughout the Indian Ocean world soon found themselves reliant on the curative work of hakims, vaidyas, and countless South Asian women. For the Portuguese a closure came in the 1540s, failed, and a collaborative dynamic re-emerged at century’s end. Similar cycles played out in the Atlantic. The timing of such a cycle for the Jesuits in Brazil is still an open question. Rather than detail their medical work, I have

relied on their letters only to explore the emergence of questions and concerns shared among the Portuguese and their descendents in Portugal’s American colonies. It is on this point, however, that the long-guarded recipe for theriac is revealing. If the Jesuits rarely praised the curative expertise of the objects of their missionary work, they nevertheless tirelessly gathered information about the plants that Amerindians used. For the list of the dozens of Amazonian ingredients used in the triaga Brasilica maps almost perfectly onto the geography of the mission villages themselves.\textsuperscript{14} The missionaries said little about their sources but the coveted recipe offers testimony where their letters to not.\textsuperscript{15}

In West Africa, even if the earliest Portuguese travelers denigrated the material culture of the peoples they encountered,\textsuperscript{16} European seafarers were nevertheless utterly impressed by the ability of communities there to reap life and livelihood from an apparently lifeless landscape. Barros, to take one example, was astounded by the ability of the "Azanhagi" to grow millet in a regions where heat and drought were so intense that they produced clefts in the soil so deep that "one could bury a horse" in them. An appreciation of the value of local healing techniques moved Cadmosto and, later, Pereira to take stock of the healing techniques they found along the coast, and to recommend them to future travelers. And take them up they did. Judith Carney has recently detailed

\textsuperscript{14}Herson provides the triaga recipe and Ribeiro offers an inventory of medicinal Amazonian plants and their origins: Bella Herson, Cristãos-novos e seus descendentes na medicina brasileira, 1500-1850 (São Paulo: Editora da Universidade de São Paulo, 1996); Lourival Ribeiro, Medicina no brasil colonial. Rio de Janeiro: [N. p.], 1971.


\textsuperscript{16}Michael Adas, Machines as the Measure of Men: Science, Technology, and Ideologies of Western Dominance (Ithaca: Cornell University Press, 1989). See the chapter on “First Encounters.”
the ways in which European merchants, sailors, and slavers depended on the agricultural surpluses and medicinal know-how of enslaved West African women and men. It was precisely those places that Europeans in the late fifteenth century had found so enigmatically lethal—the verdant coasts between the Senegal and Gambia rivers—that became only decades later the very ports at which slavers docked in order to take on both provisions and medicines. They remained so for centuries thereafter

III

Closure in one of these cycles in the Atlantic basin—in what James Sweet has termed an Afro-Portuguese Atlantic—seems to have come only decades after the publication of Abreu’s ill-fated book. Over the course of the seventeenth century, women of African descent became the healers of first resort for all members of the colonial milieu of Portuguese America—those of the coastal plantation zones. Controversy erupted during the latter half of the century when university-trained physicians from Spain and Portugal, after visiting Brazil, began to object to the clinical primacy of African-descended healers. These physicians—Simão Pinheiro Morão and João Ferreira da Rosa—rejected the work of these healers ostensibly on the grounds of their training and, by implication, their capacity to render therapeutic intervention which Morão and Rosa deemed efficacious. Yet the urban residents, colonial planters, and their families continued to embrace them. From the patients’ point of view, the work of African

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descended healers was indeed judged to have curative value.\footnote{Something of this controversy appears in James D. Goodyear, “Agents of Empire: Portuguese Doctors in Colonial Brazil and the Idea of Tropical Disease” (Ph.D. diss.: The Johns Hopkins University Press, 1982).}

Here as earlier forces ostensibly distinct from the procedures of medical knowledge-making and the clinical practice of medicine appear to have impinged upon the understanding of disease, medical intervention, and the creation and exercise of medical authority. Debates over medicine reflected, in effect, deeper tensions over the proper ordering of society. The visits of Morão and Rosa coincided with one of the most profoundly uncertain periods in colonial Brazilian history. The backdrop to the medical controversy was a half-century of economic decline, internal migration, religious turmoil, and militant slave insurrection. Dutch incursions and their occupation of Pernambuco earlier in the century weakened Brazil’s already-struggling sugar sector. That meant deepening poverty for the region’s smallholding cane farmers, who had previously supplied Brazil’s mills. In the same period, Bahia was raised to an archbishopric, bringing another wave of inspections and interrogations, and the heavy hand of the Holy Office of the Inquisition. Religious tensions and distrust—especially toward the already-marginalized poor, and especially its African-descended population—began to stiffen. In the midst of all of this was a protracted and bitter war between colonial authorities and the Americas’ largest and longest-lived runaway slave settlement, Palmares. In this period too, returns from Portugal’s Asian trade empire were, once again, rapidly falling. So it seems as though conflicts over the clinical primacy of African-descended women in colonial Brazil, grounded in definitions of professional expertise, may in fact have been linked to widespread uncertainty and to perceived threats to the ethnic hierarchies and
gender ideologies that had come to structure daily life in a beleaguered slave society—one whose fortunes now substantially underwrote a crumbling empire. But the details of that story have yet to be told.  

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20 This story may form the fifth and final case-study chapter of the prospective book manuscript.
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    Corpo Chronológico (CC)
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