

# MOSQUITO EMPIRES

ECOLOGY AND WAR IN  
THE GREATER CARIBBEAN,  
1620-1914

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NEW APPROACHES TO THE AMERICAS

YELLOW FEVER RAMPANT AND BRITISH  
AMBITION REPULSED, 1690–1780

If my soldiers began to think, not one would remain in the ranks.

– Frederick the Great<sup>1</sup>

From the 1690s, yellow fever again and again hampered military operations as well as settlement schemes in the West Indies. Malaria did too, but much less so. The largest armed expeditions were those mounted by Britain in attempts on Cartagena in 1741 and Havana in 1762. The siege of Cartagena involved the largest amphibious operation in history until the 1790s, and represented a genuine attempt to seize the trade, production, and territory of Spanish America. Had it not been for yellow fever, Britain almost surely would have prevailed at Cartagena, and pursued the dream Cromwell conceived a century before. At Havana yellow fever destroyed an army, converting a British conquest into a pyrrhic victory and a dead end.

YELLOW FEVER AND THE DEFENSE  
OF THE SPANISH EMPIRE

In the first century of its American empire, the Spanish Crown had avoided heavy investment in imperial defense, relying on distance and the logistical difficulties its enemies would face. By and large, this was enough. Sea rovers and buccaneers like Francis Drake or John Hawkins might intercept a few ships now and again, might sweep down on a

<sup>1</sup> Quoted in Houlding (1981:v).

poorly defended settlement and sack it. But Spain's enemies did not have the resources to take and hold anything of consequence.<sup>2</sup>

#### FORTIFICATION AND DISEASE

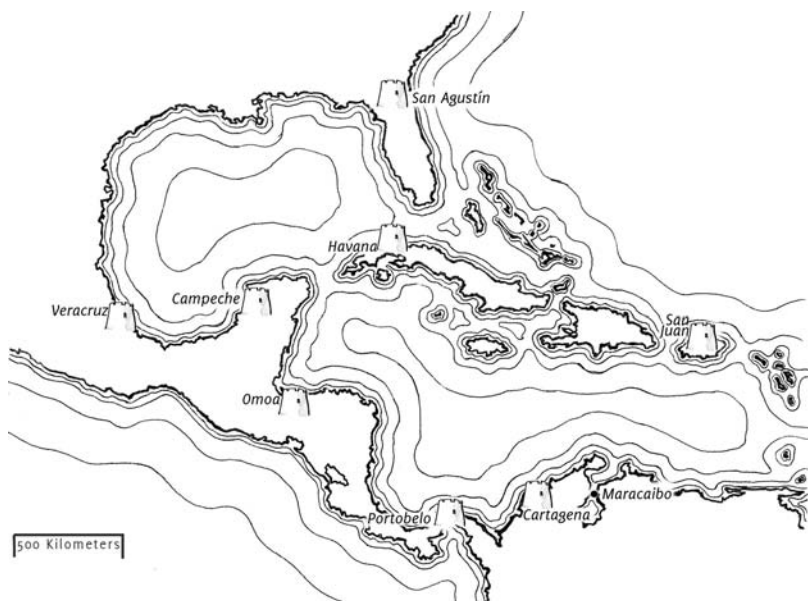
Once streams of silver from the Andes and Mexico began to flow through the Caribbean, the Spanish commitment to imperial defense in the Americas deepened. More frequent and determined Dutch, English, and French piracy required a more active policy. Moreover, all of Spain's rivals ratcheted up their predatory ambitions and hatched repeated plans to take and hold parts or all of Spanish America. Opinion was divided as to how best to safeguard the Indies. One strategy was to build naval power sufficient to defend all important sea routes. This had the advantage that the ships and squadrons in question could be shifted to home waters in moments of crisis, but had the disadvantage of costing lots of money to maintain. The Spanish Crown from the 1580s was in perpetual danger of bankruptcy, despite the influx of American silver, because of its military ambitions within Europe. While the Crown in the 1580s paid for a few galleys to patrol the waters off of Cartagena and Havana, it resisted the temptation to establish a squadron in the Caribbean until 1641, and funded it securely only from the 1680s.<sup>3</sup> In general, Spain let its navy languish from the disastrous attempt to invade England in 1588 until the 1720s.

Instead, Spain put its money in masonry. Fortification was also expensive, but once built required less maintenance than naval squadrons, and with luck could bring great savings if manned mainly by local militia. Moreover, with sufficient persuasion local populations in the Americas would help pay for fortifications, which they would never voluntarily do for ships that might at any moment be recalled to the Bay of Biscay or the Mediterranean.

From the late sixteenth century, Spain slowly built up a network of fortified strongholds in the Americas. The underlying idea was to protect choke points along the sea routes used by the trade and treasure fleets (*flotas* and *galeones*) rather than to defend territory. Cartagena and Havana got the most attention because of their roles in the Spanish trade system. In theory, trade with the Indies was confined to a convoy that left Seville (or after 1717, Cadiz) and stopped first at Cartagena

<sup>2</sup> Hoffman (1980); Andrews (1978).

<sup>3</sup> Torres Ramírez (1981).



Map 5.1. Fortified Points in the Spanish Caribbean (c. 1750)

before disbursing its goods throughout Spanish America. Cartagena – when it had naval ships – also protected the Caribbean coasts of the Isthmus of Panama, across which the silver from the Andes traveled. Havana, sometimes called “the key to the New World” for its strategic position, served as the final port of call for treasure ships en route home to Spain. San Juan in Puerto Rico also acquired fortifications, as did Veracruz somewhat later.<sup>4</sup> Minor ports received little or nothing in the way of defenses. Even an important post such as Portobelo in Panama had little in the way of fortification until the 1770s, perhaps because no local militia could be recruited and garrisons from Spain died too quickly from disease.<sup>5</sup>

Money was always short. Military engineers and governors always complained that defenses were too weak. Local councils and the Spanish Crown seemed ready to pay only in time of crisis, or only after an attack had already demonstrated vulnerability. French corsairs even sacked Havana (in the 1550s) and Cartagena (1697), and English pirates sacked

<sup>4</sup> Calderón Quijano (1984b).

<sup>5</sup> Kuethe (1983:14). Gastelbondo (1753) notes that the crews of the *flota* suffered heavily from yellow fever at Cartagena and Portobelo; so did Alcedo (1786–1789), as cited in Sánchez-Albornoz (1974:102–3).

Cartagena in 1668. But gradually, Cartagena and Havana acquired in-depth defenses with multiple castles, walls, redoubts, bulwarks, and so forth, built according to the latest standards. No other cities in the Americas could boast such fortifications.<sup>6</sup>

Fortification by the late seventeenth century was a refined art. Between 1450 and 1800, European engineers developed a precise science of siegecraft and fortification. By the 1670s, the French engineer Sébastien le Prestre de Vauban (1633–1707) set the standard with mammoth artillery fortresses intended to hold out against any imaginable assault for a period of eight weeks, after which time (the thinking went) French columns could march to the rescue and relieve any siege.<sup>7</sup> In Europe, fortresses did hold out successfully in more than three fourths of sieges attempted between 1683 and 1815.<sup>8</sup> Vauban's fortresses were very costly and needed proper garrisons, artillery, and supplies, but kings could not expect to hold territory without them. Every power, Spain included, developed the requisite engineering expertise to build them.<sup>9</sup>

Building expensive fortifications in the Americas made less sense. Relief columns would likely not arrive within eight weeks. Mobilizing a rescue across the Atlantic took several months in the best of circumstances, by which time even a well-supplied and well-garrisoned fortress would fall if competently besieged. When the French built one in what is now Nova Scotia at Louisbourg, it amounted to a waste of money and was taken twice, in 1745 and 1758, after sieges lasting seven weeks.

Only in one circumstance did reliance on fortifications make sense in the Americas: if the defenders could reasonably expect decisive intervention within eight weeks. In the Caribbean basin after the 1690s, they could. Battalions of bloodthirsty mosquitoes could intervene when and where soldiers could not.

No one knew about the role of mosquitoes, but everyone, including Spanish military planners, knew that yellow fever and other diseases

<sup>6</sup> Parcero Torre (1998:18–34); Albi (1987:130–5); Segovia Salas (1982); Calderón Quijano (1984); Kagan (2000); Parker (2000).

<sup>7</sup> Vauban (1968:12). See also Duffy (1985).

<sup>8</sup> According to a list in Landers (2004:401–3), defenders won 67 of 87 sieges. The success ratio stayed fairly steady in the various wars between 1683 and 1815, but dipped somewhat in the War of the Austrian Succession.

<sup>9</sup> Zapatero (1978) reviews Spanish military engineering in the seventeenth and eighteenth centuries. See also Duffy (1979); Albi (1987:127–40); Pares (1936:240–52) on the often poor quality of French and British fortification in the West Indies.

preyed on newcomers to the Caribbean. From experience and observation, they knew that expeditionary forces from afar would eventually fall sick and die. One military engineer, Don Silvestre Abarca, thought disease would take its toll beginning in the second week of a siege.<sup>10</sup> José de Gálvez, president of the Council of the Indies, in 1779 explained how much Spain relied on “the climate” to defeat her enemies in the Caribbean: “Taking into account that apart from good garrisons, supplies, and preparedness, the enemy will encounter a climate so dangerous that it will weaken his forces, ruin his men and food supply. . . .”<sup>11</sup>

In Veracruz, on the eastern shore of New Spain, the role of yellow fever in Spanish imperial defense was especially prominent but unusually complicated. The torrid lowlands around Veracruz hosted endemic yellow fever from perhaps the 1640s. As a British officer noted in 1740, visitors risked their lives in summers:

Vera Cruz is reckoned unhealthy, especially when the flota is there, or any great concourse of people . . . ; and when a great number of peoples loges in the Town together during these heats they are visited with a pestilential distemper called the vomito prieto, of which disease many people die.<sup>12</sup>

Throughout the coastal lowlands in the summer months, a “rain shower was enough to destroy a European army division.”<sup>13</sup> Maintaining a garrison in Veracruz proved difficult because troops recruited in upland regions of Mexico or from Spain – men who had never encountered yellow fever and perhaps not malaria – fell ill and died at appalling rates, in the worst year (1799), 50 percent annually. Recruits from highland Mexico balked at service in Veracruz.<sup>14</sup> Locally recruited troops fared

<sup>10</sup> SHM-Madrid, Sección Histórica del Depósito de la Guerra (4.1.1.1), Defensa de La Habana y sus castillos por el brigadier ingeniero director D. Silvestre Abarca; AHN, Estado, leg. 3025, Relación del estado actual de las fortificaciones de la Plaza de San Cristóbal de La Habana y demás fuertes y castillos dependientes por el ingeniero D. Francisco Ricaud de Tirgale, 8 Julio 1761.

<sup>11</sup> AGI, Santa Fe, 577-A, Don José de Gálvez a Manuel Antonio Flórez, cited in Marchena Fernández (1983:195).

<sup>12</sup> British Library, Additional MSS 32,694, “An Account of the Havanna and Other Principal Places belonging to the Spaniards in the West Indies,” 14 April 1740, fol. 76. The view that yellow fever was endemic here from the 1640s is Bustamente’s (1958:70).

<sup>13</sup> Informe del brigadier Fernando Miyares, 21 Junio 1815, SHM-Madrid, c. 97, quoted in Ortiz Escamilla (2008:39).

<sup>14</sup> Castro Gutiérrez (1996:98). I owe this citation to my colleague John Tutino.

much better, but they were in short supply as the region was sparsely inhabited. In the late eighteenth century, the disease toll among European (and Central Mexican) troops became the rationale for using black militia, who were regarded, probably correctly, as more disease-resistant. When invasion threats loomed, authorities brought regiments down from the mountains and within reach of *Aedes aegypti*. Because everyone knew that Veracruz was a death trap for new arrivals, any march toward the coast brought mass desertions. Eventually, senior commanders developed the doctrine that Veracruz should not be defended in war, indeed that the surest way to destroy an enemy force would be for it to land and stay at the port while the forces of New Spain dug in around the mountain passes on the way to Mexico City. This was brilliant strategy, and roughly analogous to the Russian reliance on “General Winter” to destroy invaders. But especially after 1778, the merchants of Veracruz were powerful enough to ensure that the city and their property would be defended, a policy that cost the lives of countless highland peasants serving in the Spanish army or colonial militia – without a shot fired.<sup>15</sup> In this respect, the Veracruz merchants resembled the planters of Jamaica, whose investments the British Army protected at the cost of several thousand deaths to fevers.

#### GARRISONS AND DISEASES

Reliance on the power of “the climate” made perfect sense as long as attackers hailed from regions free from yellow fever and most defenders were already immune. In the sixteenth and early seventeenth centuries, when fortifications were meager, attackers came in the form of corsairs and privateers, normally with only a single ship or two, and crews numbering less than a hundred. With the English, Dutch, and French settlement of several of the islands of the Lesser Antilles after the 1620s, larger expeditions of locally recruited men became imaginable. Indeed, in 1655 Barbados and other islands provided some 3,000 men for the

<sup>15</sup> Archer (1977:38–60); Archer (1971); Archer (1987); Albi (1987:132); Booker (1993); Bustamente (1958:80–3); Knaut (1997); Ortiz Escamilla (2008:52, 77–80). In 1778, new regulations liberalized trade within the Spanish Empire, to the great advantage of Veracruz, which grew quickly thereafter and became a prosperous trading center. Lind (1788:115) noted how much healthier Mexico City was than Veracruz.

assault on Hispaniola and Jamaica. But soon the English, Dutch, and French islands had slave majorities and their political stability required the ongoing presence of armed Europeans. After 1670, no slavemaster on Barbados or Martinique could cheerfully countenance the departure of a sizeable contingent of white men in an attempt on a Spanish possession. Arming either slaves or free blacks for military adventures scared most whites, although eventually, as we shall see, it happened. If large-scale attacks against Spanish strongholds came, they could come only in the form of amphibious assaults manned by luckless virus-fodder sent from Europe.

Successful defense against such attacks required garrisons composed of men resistant to yellow fever (and malaria). Troops freshly arrived from Spain would prove as vulnerable as anyone, a fact proved repeatedly.<sup>16</sup> New Spanish troops sent to the West Indies could expect to lose about a quarter of their men to disease, mainly in the first several months.<sup>17</sup> Locally recruited militia, men who had spent their childhoods surviving Caribbean diseases, held up best. The fact that populations in the Spanish Caribbean were highly urban meant that the proportion of militiamen who had weathered yellow fever in childhood was unusually high. But seasoned troops from Spain, who had lasted a few years in the lowland Caribbean, were likely to be just as fever-resistant, and normally far better soldiers than militiamen, who were notorious for their poor training and discipline. Veteran commanders preferred such seasoned troops, and dreaded the health consequences of new arrivals – just as experienced plantation owners preferred seasoned slaves and would pay less for new arrivals. Although no one understood it at the time, “herd immunity” meant that a few new arrivals could likely be absorbed into a garrison in Cartagena, Havana, or Veracruz, with little risk of yellow fever. A large influx, however, set the stage for a yellow fever outbreak.

The ideal arrangement for Spanish imperial defense in the Caribbean consisted of stout fortifications that would oblige attackers to halt for

<sup>16</sup> For example, among the garrison at Caracas in 1756–1757: “*Notóse que sólo los soldados españoles sucumbieron, mientras que no eran atacados por la epidemia ninguno de los hijos de Caracas*” Archila (1961:375). Caracas suffered yellow fever epidemics in 1694, 1756–1757, 1787, 1793, and 1798. Writing from Havana, Córdoba (1790) noted that yellow fever was the single most deadly disease among Spaniards.

<sup>17</sup> Marchena Fernández (1983:213).



weeks while mounting a siege, combined with garrisons composed of either militia and seasoned regular troops or both.<sup>18</sup> Any port or colony thus defended was as secure as Spain could possibly make it from amphibious attack. After 1764, reforms in Spanish imperial defense particularly emphasized militia and fortification in the Americas.<sup>19</sup> It took many decades and several wars, but by the 1760s the Spanish had adjusted their defense posture to the new ecological and epidemiological regime of the West Indies.

### THE DEADLY 1690S

The significance of the new ecological regime for imperial rivalries began to show only in the 1690s with the advent of large-scale warfare in the West Indies. When Louis XIV's power grew too great for his neighbors' comfort, they formed an alliance against France and went to war. In the Nine Years' War (1688–1697), also known as the War of the League of Augsburg and as King William's War, England, Spain, and the Netherlands (and some lesser powers) fought France on land and at sea, including in the West Indies. At this time, the balance of sea power increasingly favored England over France, and the Lords of the Admiralty decided to mount amphibious assaults on French sugar islands. Like everyone else, they failed to account properly for yellow fever, which at least in epidemic form had spared the Greater Caribbean since 1652.

The result was grim in 1690, Captain Lawrence Wright managed to recapture St. Kitts from the French but lost half his men to yellow fever.<sup>20</sup> Commodore Ralph Wrenn in 1692 lost his own life and more than half of his crews to yellow fever; some of his ships sank amid shoals

<sup>18</sup> In the late eighteenth century, regular troops cost the Spanish Crown seven times as much to maintain as militia, also a crucial consideration (Albi 1987:97). Regular troops were always in short supply, even when there was money to pay them.

<sup>19</sup> Albi (1987:93–140); Parcero Torre (1998); Archer (1997:10); McAlister (1954); Kuethe (1978); Kuethe (1984). Buchet (1997b:191) says, without citation, that the Spanish understood the defense value of yellow fever and called it “fièvre patriotique.” I have not seen such a term in Spanish sources but the term would be fully appropriate.

<sup>20</sup> Guerra (1996:27) says yellow fever; the textual evidence is slender. The mortality of the expedition is noted in Ehrman (1953:609); Buchet (1992, 2:782). A fuller account in most respects but blind to disease is Moss (1966:14–26).

and reefs because of a shortage of sailors to maneuver them.<sup>21</sup> Rear-Admiral Sir Francis Wheler, sent to attack the French West Indies and Canada in 1693, lost nearly half his men to a fever acquired in Barbados, and as a result gave up on a brief attempt to take Martinique. Fever dogged his fleet on his way to attack Canada. He stopped in Boston and told Cotton Mather he had lost 1,300 of 2,100 sailors (62%) and 1,800 of 2,400 soldiers (75%) to sickness.<sup>22</sup> He fired off a few cannon at French fishing villages on Newfoundland before limping home. Mosquitoes were not yet through with the Royal Navy: In 1695, Admiral Robert Wilmot lost 61 percent of his men (77% of those who went ashore) while failing in a desultory attack on St. Domingue. These were all modest campaigns in the grand strategy of King William's War, but by far the most deadly for the Royal Navy.<sup>23</sup> The habit of sending out fresh fleets each year (or two) ensured that thousands of hapless sailors with no yellow fever immunity would make the acquaintance of *A. aegypti*, and large numbers of them would die. This bleak fact seems to have troubled the Lords of the Admiralty little if at all. French cruises to the Caribbean suffered heavy mortality, too.<sup>24</sup> That did not worry the Ministry of Marine enough to forestall French designs on Cartagena.

Cartagena de Indias, on the Caribbean coast of what is today Colombia, was founded in 1533. Within a few decades, it had become the chief *entrepôt* of South America's Caribbean coast because its broad and sheltered bay was one of the best harbors in the Americas. Its strategic and commercial importance inspired attacks by Elizabethan sea dogs John Hawkins (1568) and Francis Drake (1586). After 1598, when the Spanish organized their convoy system for trade to the Indies, Cartagena was the first port of call for ships coming from Europe to Spain's colonies. In these early days, Cartagena had scant fortifications and no yellow fever to protect it.

<sup>21</sup> Details appear in Nathaniel Champney's untitled account in BL, Harleian MSS, 6378; Kendall to Blathwayt, 20 April 1692, CSP, Colonial Series, America and West Indies (1689–1692, 13:627). Moss (1966:26–7).

<sup>22</sup> Keevil, Lloyd and Coulter (1957–1963, 2:182–3), citing Mather, *The Ecclesiastical History of New England* (Hartford 1854, 1:226). Moss (1966:27–9).

<sup>23</sup> Ehrman (1953); Keevil, Lloyd, and Coulter (1957–1963, 2:181–4); Moss (1966). Details appear in CSP (1693–1696:31–101). See for example pp. 100–1, Codrington to the Lords of Trade and Plantations, 10 May 1693, in which he explains the failures of Wheler's efforts as a result of the rainy season, the weakness of European troops, and the insufficiency of local ones.

<sup>24</sup> Buchet (1991, 2:782–4).

It had more of both by 1697,<sup>25</sup> when a French fleet targeted Cartagena. Led by a career naval man, Jean Bernard Louis Desjeans, Baron de Pointis, this expedition included seven warships and about 5,000 men, including 650 buccaneers from St. Domingue. The Baron hoped to take the city and establish a commanding French position on the mainland, upwind of the all-important isthmus of Panama. Aided by surprise and a late onset of the rainy season,<sup>26</sup> the French landed unopposed near Cartagena on April 12, 1697, and managed to storm the dilapidated bulwarks and outer fortifications within days. The Spanish quickly abandoned other outposts and agreed to surrender on the condition that only the army, not the pirates, be allowed to sack the city. In early May, Pointis took control of Cartagena, having lost only sixty men. But heavy downpours began soon after the surrender at Cartagena, and with them rose swarms of *A. aegypti*.

French regulars pillaged the city for two weeks while the pirates were cooped up in an outlying fort. However, the soldiers got more than they bargained for, acquiring yellow fever as well as booty. The virus afflicted 800 men in less than a week and killed most of them. Troops fresh from France suffered more than the pirates and those already resident in the West Indies. Pointis left on May 24th. In his account of the expedition, Pointis made it clear that he departed in haste and with regret: "All my thoughts of triumph and wealth were erased by ones of sickness and death. I feared I would lose, in the most beautiful port in the world, not only the fruits of my labors but the squadron entrusted to me by the king."<sup>27</sup> Laden with loot but beset by fever, the Baron decided to make haste for France rather than share his booty with the pirates. They responded by sacking the city a second time, subjecting the inhabitants to a spasm of atrocities. The Cartagenos, however, were luckier than the departing French.

<sup>25</sup> Solano Alonso (1998:79) says the "vómito negro" had become common in Cartagena in the seventeenth century, where it attacked newcomers regularly (and went by the name "chapetonadas"). Modern scholars note yellow fever outbreaks in 1651–1652, part of the first general epidemic in the Greater Caribbean, and enough smaller ones to judge the disease endemic in the later seventeenth century. Soriano Lleras (1966:52); Valtierra (1954:751–4). On the history of the city's fortifications, Segovia Salas (1996); Zapatero (1979); Marco Dorta (1960).

<sup>26</sup> Pointis (1698:140).

<sup>27</sup> Pointis (1698:141). "*Toutes les idées de triomphe et richesse étaient effacées par celles de la maladie et de la mort. Je me croyais en état de perdre dans le plus beau port du monde, non seulement le fruit de mes peines, mais l'escadre que le roi m'avait confiée.*"

On its way home, the French squadron encountered an Anglo-Dutch fleet commanded by Admiral John Nevill, sent out to find the French fleet in the West Indies. Nevill found it after the sack of Cartagena, but the French managed to escape with the loss of one ship: a hospital ship carrying yellow fever victims. Nevill in his journal doubted the French fleet could make it home because it “hath lost so many people by sickness.”<sup>28</sup> The virus spread to the English and Dutch, who lost 1,800 men to it, including their admiral. The French fleet returned to Brest in August, having tossed overboard 24 percent of the remaining force, lost to fever. Another 34 percent were sick but still alive when they disembarked. Many soon died. But Baron de Pointis survived, gave King Louis XIV his share of the spoils, continued to serve in the navy until 1705, and lived out his days a wealthy man. Cartagena remained Spanish: Pointis could sack the city but he could not stay there.<sup>29</sup>

The bad luck that befell the soldiers and sailors under the commands of Wright, Wrenn, Wheler, Wilmot, Pointis, and Nevill was all of a piece with that which laid low the Scots at Darien. They had the misfortune to be newcomers to the Caribbean in the 1690s, when yellow fever seemed to surge through every port. Civilians suffered too in the 1690s.<sup>30</sup> More than anything else, this reflected the influx of newcomers occasioned by war and colonization. But it may also have resulted from unusually good mosquito weather, leading to vector abundance. Recent research (see Chapter 2) shows that vector abundance peaks in El Niño and ENSO+1 years. El Niño in 1692 and 1694–1696 brought conditions ideal for hatching and sustaining *A. aegypti*, so the years 1692–1697

<sup>28</sup> Nevill’s journal is in Merriman (1950:299–311), quotation from p. 306. He anchored for a day at Cartagena and his crews could have acquired the yellow fever virus there.

<sup>29</sup> Accounts include the memoirs of the principals (Pointis 1698; Ducasse 1699); as well as historical narratives (Morgan 1932; Porras Troconis 1942; Pritchard 2004:326–31) and the analysis of Buchet (1991, 1:482–6, 508, and 2:181, 193, 784). A detailed roster of Pointis’ armament and equipment appears in Buchet (1991, 2:1162–230), from Archives Nationales, Marine, 662/36, “Armement en course de l’escadre de M. le Baron de Pointis, 1697.” Matta Rodríguez (1979) and Ruíz Rivera (2001) for views using Spanish documents. The fullest study is Nerzic and Buchet (2002).

<sup>30</sup> PRO, CO 37/164, f.250 “Epidemic Fevers at Bermuda,” notes that a “very malignant fever” killed a large proportion of Bermuda’s population in 1699. Father Labat (1722, 4:211–12, 251–3) noted yellow fever in Martinique and Guadeloupe in 1698–1699. Moreau de St. Méry (1797–1798, 1:701–2) recounts yellow fever outbreaks on St. Domingue in the 1690s.

were good for mosquitoes and bad for people – worse for some than for others – in the Caribbean.<sup>31</sup>

The danger from yellow fever persisted, if not so acutely, after the deadly 1690s. Several naval expeditions during the War of the Spanish Succession (1701–1713) suffered catastrophic mortality – sometimes from yellow fever, and sometimes not.<sup>32</sup> The worst luck belonged to Vice-Admiral Francis Hosier, with whom this book began. During a crisis in Anglo-Spanish relations he was sent to patrol Spanish Caribbean coasts in 1726 (a year after another El Niño).<sup>33</sup> After visits to a few West Indian ports, his crews contracted yellow fever, which raged aboard his ships for months. He never commanded more than 3,300 men at a time, but because of replacements dragged off the shores of Jamaica, in all the expedition lost over 4,000 of 4,750 men who served (over 84%), including Hosier himself who died aboard ship cruising off Cartagena.<sup>34</sup> This gruesome episode became legendary among British mariners, the stuff of mournful ballads, helping the West Indies to acquire the reputation as a place where men went to die.<sup>35</sup> A Spanish fleet sent – quite unnecessarily, as it turned out – to hamper Hosier in 1730 lost 2,200 men to yellow fever.<sup>36</sup>

The decades from 1690 to 1730 had made clear to one and all the deadly hazards of military operations in the West Indies. They also

<sup>31</sup> Quinn and Neal (1992) and Quinn (1992) for ENSO chronology. Poveda et al. (2001) show that in Colombia both *vivax* and *falciparum* malaria spike during ENSO and ENSO+1 years.

<sup>32</sup> Buchet (1991, 2:784–8).

<sup>33</sup> According to a new ENSO chronology, the 1720s were an especially active decade. Garcia-Herrera et al. (2008).

<sup>34</sup> PRO, Admiralty 1/230 contains several letters and reports from Hosier from June 1726 to August 1727, including details on health. His last signed missive was 14 August 1727, “State of HM’s Ships at Cartagena,” in which he noted 793 of 2,776 surviving men were sick. Most would soon be dead, like Hosier himself, who died on 25 August (some reports indicate in Jamaica, not at sea). Papers relating to Hosier’s command are in British Library, Additional MSS 33028, ff. 48–174. Long (1774, 2:111) has a brief account, as do Keevil, Lloyd, and Coulter (1957–1963, 3:97–100). Correspondence in the *Calendar of State Papers* (1728–1729:164) notes Hosier was worried about rum shortages in July 1727.

<sup>35</sup> For example, the popular ballad, “Admiral Hosier’s Ghost,” penned in 1739 by Richard Glover. A version appears in Keevil, Lloyd, and Coulter (1957–1963, 3:99–100).

<sup>36</sup> Guerra (1966:27), citing Gastelbondo (1753).

probably established the yellow fever virus firmly among the monkey and mosquito populations of the region's forests, so that enduring reservoirs of virus existed almost everywhere, but especially on the mainland and the big islands, where the biggest forests and most monkeys were. It is reasonable to say that from the 1690s onward, yellow fever was reliably endemic in the Greater Caribbean region, and needed only large influxes of nonimmunes amid swarms of *A. aegypti* to become epidemic. But this prospect did nothing to quell the ambitions of those making strategy in London, where a sense of Spanish weakness was matched by a growing faith in British power. Those ambitions soon focused on Cartagena.

### SIEGE ECOLOGY AT CARTAGENA, 1741

In the decades after Pointis' attack, Cartagena resumed its roles as regional *entrepôt* and hub of Spanish imperial trade. But the convoy system was winding down, inadequate to the burgeoning demand of Spanish America for European goods. The last fleet left in 1739. Throughout the early eighteenth century, Cartagena hosted a lively smuggling business with British and Dutch merchants. Local officials found conniving at contraband more rewarding than enforcing regulations.<sup>37</sup> Cartagena's hinterland yielded silver, gold, pearls, emeralds, sugar, cotton, cacao, hides, botanical drugs, and excellent timber. In addition to its commercial role, Cartagena served as a center of the naval and military establishment of the Viceroyalty of New Granada (established in 1717), a sprawling territory comprising what is today Venezuela, Colombia, Panama, and most of Ecuador.<sup>38</sup>

Like every trading and naval port, Cartagena had a mobile and fluctuating population. That population was usually smaller than 10,000, made up mainly of people of mixed Amerindian, African, and European ancestry.<sup>39</sup> As the port of first arrival for most African slaves entering the Spanish Empire, Cartagena hosted a sizeable West African population. Between 1714 and 1736, Cartagena imported 10,475 slaves

<sup>37</sup> Grahn (1997).

<sup>38</sup> The list of exports is from Zapatero (1957). In 1740 New Granada was almost all forested, and most of its population lived in the highlands of Colombia (Palacio 2006:35, 171); (Gordon 1977:69–70). On Cartagena's military role, Marchena Fernández (1982:15–57); Segovia Salas (1996:14–34).

<sup>39</sup> Gómez Pérez (1983) says 6,000 for 1708 and 12,000 for 1778, based on archival census materials. Zulueta (1992:132) gives 20,000 as the city's population in 1741, surely too high.