

Security Studies

ISSN: (Print) (Online) Journal homepage: www.tandfonline.com/journals/fsst20

Immunity Outsourcing in Atlantic Conquest and Extraction

Mark Shirk & Simon Frankel Pratt

To cite this article: Mark Shirk & Simon Frankel Pratt (2024) Immunity Outsourcing in Atlantic Conquest and Extraction, Security Studies, 33:4, 549-572, DOI: 10.1080/09636412.2024.2434812

To link to this article: https://doi.org/10.1080/09636412.2024.2434812

Published online: 22 Jan 2025.

Submit your article to this journal

View related articles

View Crossmark data

Full Terms & Conditions of access and use can be found at
https://www.tandfonline.com/action/journalInformation?journalCode=fsst20

SECURITY STUDIES
2024, VOL. 33, NO. 4, 549–572
https://doi.org/10.1080/09636412.2024.2434812

Routledge
Taylor & Francis Group

Check for updates

Immunity Outsourcing in Atlantic Conquest and Extraction

Mark Shirk and Simon Frankel Pratt

ABSTRACT

Disease was an important part of the creation and eventual decline of piracy in ways significant to the broader process of imperial conquest and extraction. By contracting military tasks to privateers and other third parties, seventeenth-century Atlantic empires avoided significant losses to their forces from disease. These practices of "immunity outsourcing" transferred the risk of disease to local agents, who had acquired immunity to malaria and yellow fever, the dominant pathogens of the era. We adopt an eco-centric view of the relationship between the environment and politics, approached as complex entanglements of human and nonhuman processes. Through counterfactual analysis, we show that the interrelation between disease and politics generated new alliances and interests, making immunity outsourcing untenable. Disease also contributed to the decision by England to shift from an extraction economy to a plantation-based economy, as it made sustained naval operations very costly. Thus, the end of immunity outsourcing practices also helps explain why privateers were no longer needed and subsequently became "pirates." This paper has larger implications for discussions of imperialism and state formation, research into similar processes of geopolitical reconfiguration, and attempts to conceptualize twenty-first[t]-century security challenges concerning ecology, risk, and state-building.

Introduction

On 12 April 1697, a French fleet led by the Baron de Pointis landed near the Spanish South American stronghold of Cartagena with seven warships and 5,000 men, including 650 Buccaneers from nearby St. Domingue.[1] Cartagena was the chief entrepot for convoys to and from Madrid in Spain's Caribbean empire. It had a population of roughly 14,000, but its defenses had deteriorated, and the city's soldiers were badly outnumbered by the invading French forces. The French attacked within days of landing, and by 6 May, they had taken the city with only 60 casualties. Spanish

Mark Shirk is with Eagle Hill Consulting.
Simon Frankel Pratt is a lecturer at the University of Melbourne.

[1]See John McNeill, *Mosquito Empires: Ecology and War in the Caribbean, 1620-1914* (Cambridge: Cambridge University Press, 2010), 145–47.

© 2025 Taylor & Francis Group, LLC

defenders agreed to surrender on the condition that only soldiers, not buccaneers, sack the city. French soldiers would plunder Cartagena from 6 May to 17 May. Many of the city's inhabitants retreated inland. Cartagena was French—for three weeks. While sacking the city, yellow fever ravaged the French force.[2] As more men became afflicted, Pointis decided to leave the city on 24 May with the loot his force could carry. He did not share it with the buccaneers, who decided to sack the city again. This brought another round of atrocities, but eventually the original inhabitants quietly retook Cartagena. They, like many of the buccaneers, had developed immunity to yellow fever by growing up in the region and contracting the disease in childhood. Meanwhile, 24% of the French force that left Cartagena died of illness and was tossed overboard on the way home, many more were lost when a hospital ship was sunk in combat with the English and French, and 34% were sick by the time they landed in France. In the final toll, fewer than half of the 5,000 men made it back. As Pointis lamented, with "no Enemy near me; not only have lost the fruits of all our Labours, but likewise the Squadron entrusted to me."[3]

How competing empires dealt with disease reshaped the politics of the Atlantic with global ramifications. Cartagena was not a singular occurrence but rather representative of the enormous problem that disease posed to European forces seeking to control their colonies. Similar episodes happened throughout the Caribbean in the latter half of the seventeenth century in St. Kitts, St. Domingue, Martinique, and Veracruz, among others. The English and Dutch suffered as much as the French. Yellow fever and malaria made colonial military expeditions by European forces highly costly. They gave an advantage to colonists resisting such forces, even when outnumbered, in dilapidated fortifications, during an era in which military technology favored the offense in siege warfare. The challenges of conquering territory or seizing loot in the long run led competing European empires to shift their political economies in the Atlantic. They moved to the plantation complex from a system of imperial competition built around acquiring Spanish gold through military adventures—the configuration of plantations, goods, slavery, trade, and resulting political coalitions—as this coopted and exploited a stable, *immune* local population.[4] Starting in the 1650s, a plantation economy began to grow across the colonies, beginning with England's empire. Planters had different interests than those running the extraction economies. Plantations needed

[2]As Pointis noted, "no sooner were we in possession of it but the Air became infected: Eight Hundred men in six Days time, were seized with the contagious distemper." See Jean Bernard Louis Desjean Pointis, *An Authentic and Particular Account of the Taking of Carthagena by the French in the Year 1697* (London: Printed for Oliver Payne, 1740), 63.

[3]Pointis, *Authentic*, 63–64.

[4]Philip D. Curtin, *The Rise and Fall of the Plantation Complex: Essays in Atlantic History* (Cambridge: Cambridge University Press, 1990).

slaves (preferred in part on the assumption that white labor would die from disease) and, therefore, allied with merchants, reconfiguring imperial coalitions in ways that permitted new configurations of imperial governance and extraction.

This shift also had another outcome—the creation of modern piracy as a category of violence, defined by particular practices of legal censure and state counter-piracy.[5] For most of the seventeenth century, sea raiding was a vital part of imperial competition. However, with the rise of plantations and the necessity of regularized trade, sea raiding could no longer be tolerated. It had played a large role in the older imperial configuration but was a threat to the regularized trade necessary for the new one. By the eighteenth century, sea raiders caused a major crisis for England's developing plantation complex, and the English devised a major campaign to extirpate them. Sea raiders of the seventeenth century were lauded as heroes, but those of the early eighteenth century, the "golden age of piracy," were *hostes humani generis*, or enemies of humanity.[6] Both of these shifts together defined subsequent patterns of colonization and were integral in the rise of the modern state.[7]

This history contains a fundamental lesson for the study of conflict and war: ecological forces impose a myriad of needs beyond just the power of terrain to determine advantage. Even microbes shape military possibilities, and pathogens influence the parameters of political processes. Political ecologists have long held that the social and ecological are intertwined,[8] and, therefore, we advance a geopolitical account. Theories of the environment as a condition in international security are mainly geocentric, meaning they revolve around largely immutable features of the natural world, notably formations of land and water. However, an appreciation for the role of disease in generating the institutions and practices of colonial competition and power projection requires an eco-centric view of the environment. An eco-centric view differs in that it presents the security environment as a complex entanglement of human and non-human structures and processes. By implication, it moves, evolves, and in a range of ways. More so than with the geocentric view, security research using an eco-centric view rests on a relational ontology and requires an analytical apparatus especially

[5]It is not the creation of the word "pirate" that takes place (this has existed for centuries) but instead creation of piracy as the legal and cultural artifact that we know today.

[6]This is the plural. The singular, *hostis*, will be used when appropriate.

[7]Andrew Phillips, *War, Religion and Empire: The Transformation of International Orders* (Cambridge: Cambridge University Press, 2011); William J. Brenner, *Confounding Powers: Anarchy and International Society from the Assassins to Al Qaeda* (Cambridge: Cambridge University Press, 2016); Mark Shirk, *Making War on the World: How Transnational Violence Shapes Global Order* (New York: Columbia University Press, 2022); Thomson, *Mercenaries*.

[8]This is the position of political ecologists, see Paul Robbins, *Political Ecology: A Critical Introduction* (Malden, MA: Wiley-Blackwell, 2011); Raymond L. Bryant, *International Handbook of Political Ecology* (Cheltenham: EE Elgar, 2015). Nancy Lee Peluso and Michael Watts, *Violent Environments* (Ithaca: Cornell University Press, 2001).

sensitive to relationality, process, complexity, and mechanism. It is a largely non-positivist approach to theory construction.

The eco-centric view has value beyond explaining past eras of colonial history. However, by using it to analyze this case, we show that spaces of disease immunity and susceptibility are a dimension of the environment that can travel with human beings across physical geographies, along with disease itself, and are embedded in processes of state formation and transformation. In this context, disease comprises a part of the environment especially detached from features of land that normally give stability to the spaces and boundaries that structure international politics—as famously cited in the phrase "the stopping power of water," for example.[9] Appreciable as both a field of risk and as a parameter constraining effective action, disease obliged Europe to find less vulnerable third parties that could serve as contracted agents through a mechanism that may be termed "immunity outsourcing."

We trace the operation of immunity outsourcing as it gave rise to new relationships between European and colonial actors, generating new alliances and transforming practices of wealth extraction. To demonstrate the significance of immunity outsourcing, we employ counterfactual analysis based on a Bayesian logic of hypothesis comparison, a qualitative case-study approach of growing popularity that considers and compares the probability of possible causes given an observed outcome.[10] We begin by seeking to understand the origins of modern piracy, as a normative category. The separation of sea raiding from imperial politics created "public" and "private" in a place they did not exist before. As the apparent return of private violence in recent decades received much scholarly attention, along with the question of how to even define public and private violence, the causes of this transformation warrant explanation.[11] We show that modern piracy

[9]John J. Mearsheimer, *The Tragedy of Great Power Politics* (New York: WW Norton & Company, 2001).

[10]Macartan Humphreys and Alan M. Jacobs, "Mixing Methods: A Bayesian Approach," *American Political Science Review* 109, no. 4 (2015): 653–73; see also Paul Musgrave and Daniel H. Nexon, "Defending Hierarchy from the Moon to the Indian Ocean: Symbolic Capital and Political Dominance in Early Modern China and the Cold War," *International Organization* 72, no. 3 (2018): 591–626; Simon Frankel Pratt, "Norm Transformation and the Institutionalization of Targeted Killing in the US." *European Journal of International Relations* 25, no. 3 (2019): 723–47.

[11]Bryan Mabee, "Pirates, Privateers, and the Political Economy of Private Violence," *Global Change, Peace, and Security* 21, no. 2 (2009): 139–52. Sarah V. Percy, *Mercenaries: The History of a Norm in International Relations* (Oxford: Oxford University Press, 2007); Janice E. Thomson, *Mercenaries, Pirates, and Sovereigns: State-Building and Extraterritorial Violence in Early Modern Europe* (Princeton: Princeton University Press, 1994); Deborah D. Avant, *The Market for Force: The Consequences of Privatizing Security* (Cambridge: Cambridge University Press, 2005). Tarak Barkawi, "Democratic States and Societies at War: The Global Context," *Comparative Social Research* 20 (2002): 361–76; Patricia Owens, "Distinctions, Distinctions: 'Public' and 'Private' Force?," *International Affairs* 84, no. 5 (2008): 977–90; Alejandro Colas and Bryan Mabee, eds., *Mercenaries, Pirates, Bandits, and Empires: Private Violence in Historical Context* (New York: Columbia University Press, 2011); Mark Shirk, "How Does Violence Threaten the State? Four Narratives on Piracy," *Terrorism and Political Violence* 29, no. 4 (2017): 656–73. This transformation certainly has 21st century implications. For instance, *hostis humani generis* still exists in piracy law and is similar to rhetoric in the War on Terror. On this, see Alfred P. Rubin, "Terrorism and Piracy: A Legal View," *Terrorism* 3, no. 1–2 (1979): 117–30; Mikkel Thorup, "Enemy of Humanity: The Anti-Piracy Discourse in Present-Day

as a category and practice that distinguishes novel forms of public and private violence, could not have emerged without immunity outsourcing and the direct changes it generated in colonial and imperial relations in the New World. While it arose as a response to military dilemmas, its implications go beyond violence. The state is a polity produced through practices that draw boundaries around political authority, and it evolves alongside global orders.[12] New practices of violence such as piracy mean new state formations.

Our argument comprises three sections. First, we define and critique the geocentric view of security, then introduce the eco-centric view as an expanded alternative, drawing on relational sociology and process ontology. Second, we trace the emergence and operation of immunity outsourcing as a fundamental mechanism for colonial and imperial transformation in the New World. We use primary and secondary source evidence to show the improbability of the plantation complex emerging without the military pressures wrought by disease. Third and finally, we derive several lessons for considering current and emerging security challenges through the eco-centric view and consider the limits of the geocentric view in light of these challenges. We conclude with some remarks on the future of security studies itself.

Geocentric and Eco-Centric Security

The study of international security, conflict, and violence tends to discuss the natural environment along two dimensions. The first is as a branch of geopolitics in which geographic features are studied for their role in allocating military advantage, generating rivalries over assets, or imposing strict economic conditions circumscribing political possibility. From offensive realist Mearsheimer's famous remarks on the "stopping power of water" in deterring invasion to Tilly's focus on the control of riverways in his bellocentric account of European state formation, the environment has agency only as a set of antecedent and immutable parameters disposing the political behavior of the human beings who live in it.[13] The second dimension, with a more recent pedigree, is the security studies literature

Anti-Terrorism," *Terrorism and Political Violence* 21, no. 3 (2009): 401–11; Lisa Stampnitzky, *Disciplining Terror: How Experts Invented "Terrorism"* (Cambridge: Cambridge University Press, 2014).

[12]Kimberly J. Morgan and Ann Shola Orloff, eds., *The Many Hands of the State: Theorizing Political Authority and Social Control* (Cambridge: Cambridge University Press, 2017); Damon Mayrl and Sarah Quinn, "Defining the State from within Boundaries, Schemas, and Associational Policymaking," *Sociological Theory* 34, no. 1 (2016): 1–26. Stacie E. Goddard, Paul K. MacDonald, and Daniel H. Nexon, "Repertoires of Statecraft: Instruments and Logics of Power Politics," *International Relations* 33, no. 2 (2019): 304–21. Alexander Cooley and Daniel Nexon, *Exit from Hegemony: The Unraveling of American Global Order* (Oxford: Oxford University Press, 2020). Shirk, *Making War.*

[13]John J. Mearsheimer, *The Tragedy of Great Power Politics* (New York: WW Norton & Company, 2001). Charles Tilly, "War Making and State Making as Organized Crime," in *Collective Violence, Contentious Politics, and Social Change* (Routledge, 2017), 121–39.

focused on how ecological changes affect the onset of violence.[14] This literature asks whether droughts, floods, or other climatological upheavals cause conflict or cooperation. This dimension more actively recognizes the environment as something in motion, with events and processes that occur or change, sometimes as a result of human activity, which in turn can generate unforeseen transformations in political arrangements. However, it does not go as far as we argue is necessary for a genuinely eco-centric account of security.

Not every discussion of security or analysis of conflict must be eco-centric, but there are some outcomes that are hard to explain otherwise. As scope conditions, we see two types of causal process where it is especially helpful to go beyond geocentricity. First, there are causes of situated problem-solving by practitioners who must apprehend environmental forces beyond just terrain and climate, especially to include organic processes. Areas of human security such as public health or food security are good examples of this.[15] Second, macrohistorical or *longue durée* studies of state transformation may operate at a scale that obliges the inclusion of ecological systems to clarify why the trajectory of human development took one form and not the other. Certainly, the eco-centric view is not necessarily limited to the very large or the very small in terms of resolutions, scales, or levels of analysis, but these are where much existing literature appears to establish its value most clearly.

In our view, an eco-centric understanding of security requires three features. First, it must contain non-human agents. This does not mean that non-humans must carry any particular moral value or become referents of security, but it does mean that a wider range of organisms, systems, and processes must be given the analytical space to "act" on the security environment. Existing research in international politics research feature elements of this drawing from literature in science and technology studies (STS), new materialism, and pragmatism.[16]

[14]Examples include Thomas Homer-Dixon, "Environmental Scarcities and Violent Conflict: Evidence from Cases," *International Security* 19, no. 1 (1994): 5–40; Joshua W. Busby, "Who Cares about the Weather?: Climate Change and U.S. National Security," *Security Studies* 17, no. 3 (2008): 468–504; Cullen S. Hendrix and Idean Salehyan, "Climate Change, Rainfall, and Social Conflict in Africa," *Journal of Peace Research* 49, no. 1 (2012): 35–50; Shlomi Dinar, *Beyond Resource Wars: Scarcity, Environmental Degradation, and International Cooperation* (Cambridge, MA: MIT Press, 2011); Francis Galgano, ed., *The Environment-Conflict Nexus: Climate Change and the Emergent National Security Landscape* (London: Springer, 2019).

[15]Jeremy Youde, *Global Health Governance in International Society* (Oxford University Press, 2018); Charles P. Martin-Shields and Wolfgang Stojetz, "Food Security and Conflict: Empirical Challenges and Future Opportunities for Research and Policy Making on Food Security and Conflict," *World Development* 119 (2019): 150–64.

[16]Olaf Corry, "Nature and the International: Towards a Materialist Understanding of Societal Multiplicity," *Globalizations* 17, no. 3 (2020): 419–35; Erika Cudworth and Stephen Hobden, "Of Parts and Wholes: International Relations Beyond the Human," *Millennium* 41, no. 3 (2013): 430–50; Simon Frankel Pratt, "Pragmatism as Ontology, Not (Just) Epistemology: Exploring the Full Horizon of Pragmatism as an Approach to IR Theory," *International Studies Review* 18, no. 3 (2016): 508–27.

Second, human agents must be "ecologized" in the sense that their actions must be defined not just as a response to environmental conditions but also as a cause of those conditions. Literature on climate change and international security certainly considers how anthropogenic global warming generates environmental effects, but there are other less recognized areas where recursive causal relationships exist between human beings and their ecological context: there are political consequences to the spread and evolution of pathogens, the transformation of water systems due to engineering activities, such as the building of canals and dams, and changes in animal populations due to the introduction of invasive species or the alteration of animal food supply through cultivation of grazing land. Complexity theory is one example of an analytical apparatus able to grasp feedback loops and threshold effects better than most, and it, too, has a strong presence in security literature.[17]

Third, the eco-centric understanding must be evolutionary, meaning it must treat actors as continually changing as a result of adaptation—a need that has direct ontological implications, suggesting the need to put "relations before states" and to avoid reifying changing relationships and activities into static structures.[18] Strategic theory already acknowledges that technological or institutional changes can end some threats and create others and that risk and opportunity continually fluctuate, but an eco-centric understanding goes further, considering that the actors engaging in strategic interaction themselves are always changing, sometimes in very significant ways.

All three of these features are evident in the argument we make about immunity outsourcing. We define immunity outsourcing as an attempt to avoid the costs of disease by contracting specific tasks to populations that have already developed immunity by already bearing the costs of disease at a prior period. The costs of disease are two-fold: an immediate loss in human capital due to the attritional effects of sickness, and a temporal loss as the immunity needed to reduce attrition takes decades to develop within a population. Immunity outsourcing itself is very costly, as independent parties with immunity may not exist in significant numbers needed to perform certain tasks (such as wealth extraction via conquest) or may be unreliable agents with a tendency to follow their own agendas. Immunity outsourcing may be a viable short-term option, but if its costs are too significant, actors will have strong incentives to search for ways to navigate pathogens without outsourcing, develop new extractive practices

[17]Antoine Bousquet and Simon Curtis, "Beyond Models and Metaphors: Complexity Theory, Systems Thinking and International Relations," *Cambridge Review of International Affairs* 24, no. 01 (2011): 43–62; see also Robert Jervis, *System Effects: Complexity in Political and Social Life* (Princeton University Press, 1998).

[18]Patrick Thaddeus Jackson and Daniel H. Nexon, "Relations before States: Substance, Process and the Study of World Politics," *European Journal of International Relations* 5, no. 3 (1999): 291–332.

that institutionalize longer-term contracts without the same principal-agent problems, or abandon some environmental spaces entirely, establishing what some might call "the stopping power of disease."

Methodologically, studying the effects of causal mechanisms such as this one in eco-centric terms is challenging. The study of processes and of complexity are both poorly suited to a positivist logic of analysis, where causes and effects are expressed in terms of discrete variables that scale or occur together in linear relationships within identifiable parameters. Counterfactual reasoning is essential, as is the ability to conceive of alternative systems, rather than merely alternative quantities of an effect.

In the next section, in our case study of immunity outsourcing and the transformation of colonial political economy, we use a Bayesian-aligned approach to counterfactual process tracing.[19] We provide a historically demonstrable account, then show at key junctures whether that account is more probable if immunity outsourcing were an active mechanism or if it were absent. This is a qualitative explanatory approach in which we infer the conditions of possibility for an observed phenomenon through probabilistic reasoning. As we will now show, this approach strongly suggests that immunity outsourcing was an active consideration in the shift from extractive to plantation economics and that this, in turn, supports the view that the military dynamics of colonial arrangements should be understood according to an eco-centric view of security.

The Stopping Power of Disease

The rise and fall of privateering, in which European empires first relied upon private actors to fight their battles in the Caribbean, on sea and sometimes on land, and then ceased the practice, is well documented. Some scholars have looked to shifting legal and moral narratives on sea raiding.[20] Others have focused on the development of a new oceanic political economy in the Atlantic, which made private military actors costly rather than useful.[21] Still others have focused on growing tensions between the East India Company and the Mughal Empire, which generated a much broader reassertion of state military control over colonial violence.[22] All

[19]Macartan Humphreys and Alan M. Jacobs, "Mixing Methods: A Bayesian Approach," *American Political Science Review* 109, no. 4 (2015): 653–73; see also Paul Musgrave and Daniel H. Nexon, "Defending Hierarchy from the Moon to the Indian Ocean: Symbolic Capital and Political Dominance in Early Modern China and the Cold War," *International Organization* 72, no. 3 (2018): 591–626; Simon Frankel Pratt, "Norm Transformation and the Institutionalization of Targeted Killing in the US," *European Journal of International Relations* 25, no. 3 (2019): 723–47.

[20]Burgess, "Piracy"; Shirk, "Violence."

[21]Mabee, "Pirates"; Alejandro Colas and Bryan Mabee, "The Flow and Ebb of Private Seaborne Violence in Global Politics," in Colas and Mabee, eds. *Mercenaries, Pirates, Bandits, and Empires*, 83–106.

[22]Philip J. Stern, "'A Politie of Civill & Military Power': Political Thought and the Late Seventeenth-Century Foundations of the East India Company-State," *Journal of British Studies* 47, no. 2 (2008): 253–83.

of these factors almost certainly mattered, and indeed, the account here sustains this existing scholarship.

However, disease and its implications constitute an essential and underappreciated additional factor. The enormous rates of attrition disease imposed on European expeditions significantly increased the loss of strength gradient for projecting power across the Atlantic, meaning that the strength of any military force diminished especially sharply in these distant areas of operation. It first incentivized the use of private actors as European forces suffered enormous, crippling rates of deadly illness. This is the immunity outsourcing mechanism at work. Then, it incentivized a broader shift away from conquest and resource seizure in favor of longer-term plantation projects as European empires came to terms with the impossibility of militarily acquiring the land and wealth of the New World and the Caribbean in particular. Disease thus generated the conditions for both the rise and fall of privateering and buccaneering.

The two diseases able to stop European armies from waging sustained campaigns or enjoying the fruits of their limited successes were yellow fever and malaria, which together ravaged the seventeenth century Atlantic.[23] Yellow fever is a disease caused by the Flavivirus. The "yellow" refers to jaundice, a common symptom.[24] It is not directly transferrable but relies on the *Aedes Aegypti* mosquito as a vector between humans or humans and monkeys.[25] Mortality numbers are hard to ascertain. Best guesses are that 30–50% of those infected died, ranging up to 80%.[26] Yellow fever hit prime-age males hardest, and children who contracted the disease developed immunity. Mitigation was often built around "seasoning," having future settlers spend time in a hot climate, and explanations based on race and gender.[27] Its eradication as a deadly disease occurred only when the United States Army dedicated a project to eradication upon occupying Cuba in 1898.[28] Today, a vaccine is available, though outbreaks

[23]Dorothy Crawford, *The Invisible Enemy: A Natural History of Viruses* (Oxford: Oxford University Press, 2002); Thomas P. Monath, "Yellow Fever: An Update," *The Lancet Infectious Diseases* 1, no. 1 (2001): 11–20; Alan D. T. Barrett and Thomas P. Monath, "Epidemiology and Ecology of Yellow Fever Virus," in *Advances in Virus Research*, ed. Thomas J. Chambers and Thomas P. Monath, Vol. 61 (Academic Press, 2003); Oyewale Tomori, "Yellow Fever: The Recurring Plague," *Critical Reviews in Clinical Laboratory Sciences* 41, no. 4 (2004): 391–427; Jari Vainio et al., "Yellow Fever," 1998, https://apps.who.int/iris/handle/10665/64455. James L. A. Webb, Jr., *Humanity's Burden: A Global History of Malaria* (Cambridge: Cambridge University Press, 2009); Randall M. Packard, *The Making of a Tropical Disease: A Short History of Malaria* (Baltimore: Johns Hopkins University Press, 2011).

[24]Rev. Griffith Hughes, *The Natural History of the Island of Barbados* (London: Printed for the Author, 1750), 92–93.

[25]Vectors are living organisms able to transmit disease between humans or humans and animals.

[26]McNeill, *Mosquito Empires*, 37–39.

[27]Suman Seth, *Difference and Disease: Medicine, Race, and the Eighteenth-Century British Empire* (Cambridge: Cambridge University Press, 2018).

[28]Matthew Lewis, *Journal of a West Indian Proprietor: Kept during a Residence in the Island of Jamaica*, ed. Judith Terry (Oxford: Oxford University Press, 1999), xiv.

still happen.[29] There is no treatment, and roughly half of those with severe symptoms die.[30]

Malaria comes from the parasite plasmodium. The *Anopheles* mosquito acts as a vector.[31] Mortality rates for malaria are incomplete, given the different strains and lack of record keeping, but it was deadly. Malaria affected children more than adults, although survivors did gain some immunity. The current vaccine has low efficacy and is not recommended by the World Health Organization, though there are trials for a more effective one.[32] Malaria is no longer as deadly if treated early, though sadly, it is still a major killer in Sub-Saharan Africa. In colonial contexts, however, both diseases, and especially yellow fever, ravaged Europeans lacking immunity. Their tolls upon metropolitan military forces limited colonial gains through pure extraction, causing subsequent strategic failures to otherwise militarily successful missions.

Crucial to the argument in favor of an eco-centric view of security, in which human beings and their environments co-evolve, is an often-overlooked historical fact: neither yellow fever nor malaria was part of the terrain or geography of the region prior to colonization. Rather, they were brought, and bred, because of European settlement and its ecological consequences. Both are believed to have arrived on slave ships from West Africa. Yellow fever was most likely brought to the New World in the late 1620s or early 1630s.[33] The first major breakout was probably in 1647 in Barbados.[34] Malaria may have arrived as early as the fifteenth century. Tragically, the new world already contained carrier species of *Anopheles*, supplying a native vector.[35] Major outbreaks of malaria only proliferated with permanent European settlements.[36] Colonization did not merely introduce these two diseases, but also inadvertently caused massive growth in mosquito populations. European diseases such as smallpox wiped out native inhabitants prior to settlement. Europeans, Western Africans,

[29]The Lancet Infectious Diseases, "Yellow Fever: The Consequences of Neglect," *The Lancet Infectious Diseases* 16, no. 7 (2016): 753.

[30]The Mayo Clinic: https://www.mayoclinic.org/diseases-conditions/yellow-fever/symptoms-causes/syc-20353045.

[31]The Anopheles is a genus with more than 400 species, of which only about 40 can host malarial plasmodia. I thank John McNeill for this information.

[32]"Investigational Malaria Vaccine Gives Strong, Lasting Protection," National Institutes of Health, June 30, 2021, https://www.nih.gov/news-events/news-releases/investigational-malaria-vaccine-gives-strong-lasting-protection.

[33]There is uncertainty as to when the Yellow Fever arrived in the New World, see Charles S. Bryan, Sandra W. Moss, and Richard J. Kahn, "Yellow Fever in the Americas," *Infectious Disease Clinics of North America*, Historical Aspects of Infectious Diseases, Part II 18, no. 2 (2004): 275–92; Crawford, *Enemy*; Scientific and historical evidence points to African origins, see Juliet E. Bryant, Edward C. Holmes, and Alan D. T. Barrett, "Out of Africa: A Molecular Perspective on the Introduction of Yellow Fever Virus into the Americas," *PLOS Pathogens* 3, no. 5 (2007): e75; Trevor Burnard, "E Pluribus Plures: African Ethnicities in Seventeenth and Eighteenth Century Jamaica," *Jamaican Historical Review* 21 (2001): 8–22.

[34]Crawford, *The Invisible Enemy*, 23.

[35]Barbados, with no native Anopheles, was an exception and would become a sanatorium for Malaria sufferers, Webb, *Humanity's*, 78.

[36]Ibid., 66–91.

and new plants and animals repopulated them.[37] Sugar was brought to the Caribbean with Columbus, and its cultivation led to deforestation, creating better breeding conditions for mosquitos.[38] Barbados was covered with trees when the English landed in 1627 and was densely forested as late as 1650.[39] By 1666, it was importing timber because so much land was used for plantations, which were an advantageous breeding ground for disease.[40] In plantation colonies, *Aedes Aegypti* laid its eggs on the walls of water storage vessels and in runoff following rainstorms.[41] Meanwhile, the region's climate fluctuations further aided mosquito populations in a deadly interaction effect. Epidemiologists can trace yellow fever outbreaks in the Caribbean to El Nino Southern Oscillation (ENSO) events. Another factor is the Little Ice Age from the fifteenth to nineteenth centuries (with its nadir in the seventeenth century).[42] The 1640s and 1660s had "notably colder winters and cooler summers."[43] This brought about more severe ENSO events[44] and drier conditions in the northern tropics,[45] which again are linked to yellow fever outbreaks. ENSO is a recurring event whereby the Eastern Pacific warms while the Western Pacific cools. This has global ramifications, altering temperatures and rainfall patterns in locally specific ways.[46] ENSO events often caused droughts in the Caribbean's early rain season (May–June) followed by excess rain in the later season (Sept–Oct) and early the next year.[47] Drought kills the *Aedes Aegypti's* predators while forcing communities to store water

[37]W. George Lovell, "'Heavy Shadows and Black Night': Disease and Depopulation in Colonial Spanish America," *Annals of the Association of American Geographers* 82, no. 3 (1992): 426–43; Donald Joralemon, "New World Depopulation and the Case of Disease," *Journal of Anthropological Research* 38, no. 1 (1982): 108–27; Ezra Zubrow, "The Depopulation of Native America," *Antiquity* 64, no. 245 (1990): 754–65; Alfred W. Crosby, "Virgin Soil Epidemics as a Factor in the Aboriginal Depopulation in America," *The William and Mary Quarterly* 33, no. 2 (1976): 289–99.

[38]McNeill, *Mosquito*, 22–32.

[39]Richard Ligon, *A True and Exact History of the Island of Babardos* (London: Henry Moseley, 1657), 44, 72–79.

[40]CSPCS-AWI 17/970. See also McNeill, *Mosquito*, 27. Horses became unusable on the island, see Ligon, *True*, 58; Keith Pluymers, *No Wood, No Kingdom: Political Ecology in the English Atlantic* (Philadelphia: University of Pennsylvania Press, 2021), 167-92.

[41]Andrew Spielman and Michael D'Antonio, *Mosquito: A Natural History of Our Most Persistent and Deadly Foe* (London: Faber, 2001).

[42]Dagomar Degroot, "Climate Change and Society in the 15th to 18th Centuries," *WIRES Climate Change* 9, no. 3 (2018): e518.

[43]Geoffrey Parker, *Global Crisis: War, Climate Change, and Catastrophe in the Seventeenth Century* (New Haven: Yale University Press, 2013), 445–46.

[44]Degroot, "Climate."

[45]Chad S. Lane, Sally P. Horn, Kenneth H. Orvis, and John M. Thomason, "Oxygen Isotope Evidence of Little Ice Age Aridity on the Caribbean Slope of the Cordillera Central, Dominican Republic," *Quaternary Research* 75, no. 3 (2011): 461–70.

[46]There is still debate over the causes and characterizations of ENSO. See Richard Grove and George Adamson, *El Nino in World History* (London: Palgrave MacMillan, 2018), 1–7.

[47]A. Anthony Chen and Michael A. Taylor, "Investigating the Link between Early Season Caribbean Rainfall and the El Niño + 1 Year," *International Journal of Climatology* 22, no. 1 (2002): 87–106; Mark Jury, Björn A. Malmgren, and Amos Winter, "Subregional Precipitation Climate of the Caribbean and Relationships with ENSO and NAO," *Journal of Geophysical Research: Atmospheres* 112, no. D16 (2007); Mark R. Jury, "A Quasi-Decadal Cycle in Caribbean Climate," *Journal of Geophysical Research: Atmospheres* 114, no. D13 (2009).

where mosquitos can breed. The heavier rains allow the mosquito population to flourish.[48] The first documented outbreak of yellow fever followed an ENSO in 1647. There were further ENSO events in 1692 and 1694–96. The significance of these changes for geopolitical, military, and security contexts only becomes apparent when understood through an eco-centric lens.

Recall that European empires were constantly at war in the New World. England (and France and the Netherlands), in its wars with Spain in the seventeenth and early eighteenth centuries, did little to Spanish centrality in gold and silver trade. Spanish explorers discovered and colonized the greater Caribbean in the early sixteenth century. They remained the only imperial power with permanent colonies into the 1620s. Spanish explorations unearthed gold and silver mines in the Americas, allowing them to control the flow of currency on the continent. Its colonial economy was built on the extraction of raw materials. Rivals were unable to challenge this position by capturing either the ports through which bullion flowed or the islands that could act as choke points for sea lanes. Gold and silver made control of the Caribbean a necessity for Spain. Rivals entered the region to access Spanish wealth. In other words, the pre-plantation political economy of this period was a contest over gold and silver, and in this contest, the Spanish Empire was dominant.

Spanish claims on the entire new world proved geopolitically empty despite their economic dominance, as Spain was only able to enforce its primacy during this period south of the Tropic of Cancer.[49] The Spanish Crown had an interest in maintaining a monopoly on goods to and from its colonies and, as a result, banned all foreign ships "beyond the line." However, colonial demand created a robust market for "illegal" goods from French and English traders.[50] Spain's solution to this security dilemma was to outsource to local private providers, defending its territory by granting privateers the right to search and attack any unauthorized foreign ship. Rivals commissioned privateers to retaliate against Spanish ships.[51] Imperial

[48] Jonathan M. Chase and Tiffany M. Knight, "Drought-Induced Mosquito Outbreaks in Wetlands," *Ecology Letters* 6, no. 11 (2003): 1017–24; Fernando Sanchez Rodrigo, "The Influence of Meteorological Conditions on the Yellow Fever Epidemic in Cádiz (Southern Spain) in 1800: A Historical Scientific Controversy," *Atmosphere* 11, no. 4 (2020): 405. For studies on dengue fever, for which the *Aedes Aegypti* is also a vector see Alexandre S. Gagnon, Andrew B. G. Bush, and Karen E. Smoyer-Tomic, "Dengue Epidemics and the El Niño Southern Oscillation," *Climate Research* 19, no. 1 (2001): 35–43; Dharmaratne Amarakoon, Anthony Chen, Sam Rawlins, Dave D. Chadee, Michael Taylor, and Roxann Stennett, "Dengue Epidemics in the Caribbean-Temperature Indices to Gauge the Potential for Onset of Dengue," *Mitigation and Adaptation Strategies for Global Change* 13, no. 4 (2008): 341–57; For Anopheles and malaria see Germán Poveda, William León Rojas, Martha Quiñones, Iván D. Vélez, Ricardo I. Mantilla, Daniel Ruiz Carrascal, Juanita S. Zuluaga, and Guillermo L. Rua, "Coupling between Annual and ENSO Timescales in the Malaria: Climate Association in Colombia," *Environmental Health Perspectives* 109, no. 5 (2001): 489–93.

[49] For debates about the line see Garrett Mattingly, "No Peace Beyond What Line?," *Transactions of the Royal Historical Society* 5:13 (1963): 145–62; Ian Kenneth Steele, *The English Atlantic, 1675–1740: An Exploration of Communication and Community* (Oxford: Oxford University Press, 1986); Benton, Sovereignty.

[50] I.A. Wright, ed., *Spanish Documents Concerning English Voyages to the Caribbean, 1527–1568* (London: Hakluyt Society, 1929), 8–9.

[51] Mattingly, "No Peace"

competition manifested through contracted sea raiding, with privateers serving as both disposable and disease-resilient proxies.

Encapsulated in the phrase "no peace beyond the line," the New World became an area where violence would not risk war in Europe. "The line" separated realms of layered sovereignty: Europe/State and New World/Empire.[52] This allowed for competition without risking war. As the 17th century progressed, Spanish power waned. A Secretary of the Lords of Trade, Sir Robert Southwell, called them, "the great Carcass, upon which all the rest doe prey."[53] However, European rivals were unable to spark meaningful change. They fought over the ability to control trade routes with ports and islands the spoils, and in this context siege warfare was common.[54] The Spanish controlled important mines, ports, and trade routes, since they were often the defenders. However, on the continent, technological developments such as big cannons turned the advantage to the offense. This was not the case in the Caribbean after 1647 when attackers were at a disadvantage.

Yet disease is a crucial component of this story and a major advantage for the defense. It was common for English and other European countries to besiege a Spanish garrison, only for disease to decimate their ranks.[55] Inhabitants, who were low on defenders and who had, by and large, gained immunity as children, frequently allowed invaders to take over and let mosquitos defend the city. This became a common strategy in Veracruz, to cite one example. Disease became a weapon. This allowed for defense on the cheap, allowing the Spanish crown to maintain its Atlantic empire long after its star waned in Europe. Spain invested in building fortifications designed to extend sieges until fevers took hold. While attacking forces usually comprised recruits fresh from Europe without immunity, defending forces were made up of immune natives and Europeans. Nor could England and France easily recruit soldiers in their own colonies. Plantation owners did not want "seasoned" white soldiers, currently quelling slave revolts, to fight wars elsewhere, nor did they wish to arm the black population (though this did happen). Thus, luckless European recruits without immunity performed offensive missions for which they were literally ill-suited, reinforcing Spanish primacy.[56]

At first glance, England's capture of Jamaica is an exception, but closer examination shows otherwise. Conditions were as favorable as

[52]Mark A. Shirk, "'Bringing the State Back in' to the Empire Turn: Piracy and the Layered Sovereignty of the Eighteenth Century Atlantic," *International Studies Review* 19, no. 2 (2017): 143–65.

[53]Abigail Swingen, *Competing Visions of Empire: Labor, Slavery, and the Origins of the British Atlantic Empire* (New Haven: Yale University Press, 2015), 140.

[54]Jan Glete, *Warfare at Sea, 1500-1650: Maritime Conflicts and the Transformation of Europe* (London: Routledge, 2000).

[55]John McNeill, "Ecology, Epidemics and Empires: Environmental Change and the Geopolitics of Tropical America, 1600-1825," *Environment and History* 5, no. 2 (1999): 175–84.

[56]McNeill, *Mosquito*, 137–43.

possible—dormant yellow fever, massive numerical advantages—and the mission still was fraught. Oliver Cromwell hatched a plan in 1655, using commonwealth troops loyal to him, to capture Spain's Caribbean empire. The first objective was to take one island and use it as a base for further attacks. While the 1640s saw ENSO events and major outbreaks of yellow fever, in the 1650s, it was largely dormant.[57] Still, the plan failed. The first attempt at an island was Santo Domingo, where the English lost almost 1700 of the 9700 men who set sail due to disease and stout defenses.[58] Following this loss, the English attacked lightly populated, strategically unimportant Jamaica. One observer reported that there were only 500 men at the town of Oristano.[59] The English brought 8,000 soldiers. Soon after the fighting was done, the rains began. The expedition leader wrote, "the rains will kill us all"[60] while an anonymous writer noted, "never did my eyes see such sickly a time, not so many funerals and graves … we have lost half of our armie [*sic*] from our first landing."[61] Jamaica was captured and held but the English had more than a 3 to 1 advantage, and furthermore were fielding soldiers versus local citizens. Fewer than 4,000 of the 9,700 who left England survived a year due to malaria and various dysenteries. Although Jamaica was later important in sugar production, Cromwell's plan to conquer Spain's empire was in ruins. The conquest was the last effective offensive action in the West Indies for more than a century.[62] It succeeded at great cost and, as in other less successful attempts, disease caused greater attrition than enemy action by a factor.

The significance of disease on warfare in the region really began to show during the Nine Years War (1688–1697). ENSO conditions in 1686–8, 1692, and 1694–96 made the war a good one for disease and defenders.[63] The Cartagena campaign previously outlined is the starkest example, but it is far from the only one. At the start of the war, English governors warned that sickness made defending their islands nearly impossible, a problem ameliorated by similar conditions on French Islands preventing attacks.[64] A successful expedition to retake St. Kitts lost 50% of its men to disease in 1690. The mission was successful in large part because French defenders died after taking the island. In 1693, an attempt to take Martinique led to losses of 62% of sailors and 75% of soldiers to sickness. In 1695, an attempt to take St. Domingue led to 62% dying due to

[57] McNeill, *Mosquito*, 97–105.
[58] I.S., A *Brief and Perfect Journal of the Late Proceedings and Successe of the English Army in the West-Indies* (London, 1655), 16.
[59] Ibid, 20.
[60] McNeill, *Mosquito*, 99.
[61] C.H. Firth, ed., *The Narrative of General Venables* (London: Longmans, Green, and Co., 1900), 44.
[62] Ibid, 142.
[63] Grove and Adamson, *El Nino*.
[64] For the Leewards, see CSPCS-AWI 13/779; for Nevis, see CSPCS-AWI 13/771; for St. Christopher, see CSPCS-AWI 13/444. CSPCS-AWI 13/548; see, also, CSPCS-AWI 13/779.

sickness, including 77% of those who went ashore. In other words, European forces could expect their expeditions to suffer casualties that would make most victories pyrrhic were they to occur in any European campaign.

A consideration of the counterfactual, that disease was militarily insignificant in determining control of the Caribbean, shows that no other factor reasonably explains the weakness and repeated failures—or the very costly and limited successes—of invading forces. Spain's power was waning on the continent, and technology favored offense in siege warfare. The French in Cartagena and the English in Jamaica had large forces, and they were both successful in battles when they were fought. A geopolitical and tactical assessment suggests that they should have been able to significantly erode or conquer Spanish colonies. Indeed, defeat only came to the French campaign because of disease, and the English held Jamaica, a relatively less valuable holding prior to the rise of the plantation economy, because there was no Spanish or French force around to threaten it. Crucially, Spain's conquests came before the introduction of yellow fever, while the major challenges to its rule came after. Once introduced, these diseases massively altered the loss of strength gradient, significantly increasing the costs of fielding and projecting military power from Europe to the Caribbean. Conversely, without disease, the British and French would very likely have made inroads into Spain's empire. Privateering, an important seventeenth-century practice, may never have become a problem for European empires or might not have arisen at all if European forces had been able to survive Caribbean campaigns. In the next section, we will show how it emerged as a significant issue in large part as a response to the stopping power of disease.

Outsourcing and the Shift from Adventure to Plantation

The rise of privateering lies with early attempts by England and France to develop new ways to gain access to Spanish gold that did not risk the loss of entire expeditions to yellow fever and malaria. Local forces of raiders, buccaneers, and smugglers offered a solution. While they had long been employed by European empires to assist in military activities, their value and use rose. For most of the sixteenth and seventeenth centuries, Atlantic Sea raiders were semi-independent agents of the state. They were privateers with "letters of marque" working on behalf of governments and lauded as patriotic heroes. As one English colonial official opined, "if money or good plunder be in the case they will either win it manfully or dye coradgiously [*sic*]."[65] The privateers of this era tended to raid with

[65]The National Archives, Kew, London, UK (TNA), Colonial Office Papers (CO), Box 1/25, folio 160.

their fellow countrymen, such as a French pirate colony on Tortuga or an English one on Port Royal. Sea raiders were thus tools of inter-imperial competition.[66]

Privateers sometimes went rogue, but this was tolerated.[67] In one notable example, English privateer Henry Morgan sacked Panama City despite hostilities having ended between England and Spain. In 1670, after the Spanish attacked the northern coast of Jamaica, the colony's governor, Thomas Modyford, had given Henry Morgan a letter of marque to raid Spanish settlements. In 1671, over six months after the Treaty of Madrid abrogated the letter, Henry Morgan sacked Panama City. One observer commented that Morgan and his men "committed many … cruelties. They showed little mercy, even to the monks…. Nor did they spare the women, except for those who yielded themselves completely."[68] Morgan was captured and sent to London for punishment. Instead, King Charles II knighted Morgan and appointed him the lieutenant governor of Jamaica, under Modyford.

Methodologically, a probabilistic counterfactual approach strongly suggests that disease was a key factor in the rise of privateering. While sources do not directly say "we hired privateers because they were immune to illness," the extensive employment of private actors in paramilitary roles in the above ways is improbable without the stopping power of disease. Consider that privateers went rogue in costly ways, introduced principal-agent problems, and took payment in plunder that could otherwise be directed to the treasuries of imperial great powers or at least to their colonial governments. If European forces could be directly employed without the enormous costs imposed by disease, these problems could have been avoided entirely. Put differently, in a world without yellow fever and malaria, the conditional probability of widespread privateering in the Caribbean is low, given the risks and costs of outsourcing and the benefits of using uniformed military forces, disease-driven attrition notwithstanding.

Yet these avenues, while making some individuals rich, did not enrich the empire as much as hoped, and plans for conquering the Spanish Main were as fanciful as ever. The problem remained because the military benefits conferred by private military actors were not enough to make adventures profitable or geopolitically successful. European empires decreased their reliance on privateers and sought to exclude them from any future governance of the colonies. The 1690s demonstrates this shift. In November 1694, Captain Thomas Tew had set sail from New York

[66]Alexander O. Exquemelin, *The Buccaneers of America*, trans. Alexis Brown (Mineola, NY: Dover Publications, 1969), 125.
[67]Lauren Benton, *A Search for Sovereignty: Law and Geography in European Empires 1400-1900* (Cambridge: Cambridge University Press, 2010), 113.
[68]Exquemelin, *Buccaneers*, 200–201.

with a letter of marque from Governor Benjamin Fletcher to attack French ships.[69] Tew was a notorious privateer who reputedly pioneered the infamous "pirate round" (a trip from the Americas, around the Cape of Good Hope, and into the Red Sea) and had deep connections with the growing pirate community on Madagascar. In December 1695, King William III signed a letter of marque for one Captain William Kidd to hunt pirates and named Tew specifically.[70] Tew was attacked while in the Red Sea and killed in the ensuing battle (before Kidd set sail).[71] Kidd himself acted as he had on previous commissions, even going beyond his letter to attack unsanctioned ships. One captured ship, the *Quedagh Merchant*, was owned by Abd-ul Ghaffur, an important figure in Mughal Emperor Aurangzeb's court. The East Indian Company had already been under pressure from the emperor to do something about English piracy, and Kidd became the company's bugaboo. Kidd sailed to New York, where one of his financiers, Lord Bellomont, was governor. Bellomont arrested him, declaring, "I had an account that he was certainly turned pyrate [*sic*]."[72] Bellomont and his allies also kept the "French passes"—documents legalizing the *Quedagh Merchant* capture—from Kidd.[73] Despite bribes and Kidd's protestations that his capture was illegal (he was probably right), Kidd was hanged, and his body was left in a cage over the Thames as a warning to pirates.[74] Sea raiders such as Tew and Kidd differed little from Morgan in practice. However, Morgan's attacks were deemed beneficial, and thus, he was knighted, while Kidd and Tew were declared pirates. Peacetime privateering as a practice fell out of favor, and privateers became pirates.[75]

These shifts and their impact on sea raiding can be seen more generally in the case of Jamaica. Situated close to major trade routes, Jamaica originally acted as an English privateering base. Privateering was responsible for much of Jamaica's wealth and governance into the 1670s.[76] Steward General Cornelius Burroughs wrote that Jamaica "lyes very opportunely to annoy the Spaniard, both upon the Maine and also in his trade by Sea."[77] Privateering also made Jamaica an important source of goods to North America. The island's power base was in Port Royal, and the privateers were an important local political faction. Morgan was made lieutenant governor to keep this faction in line.

[69]NYCD IV, 446–47.
[70]For letter of marque, see TNA High Court of the Admiralty (HCA) 25/12. For ship's registration, see 26/13.
[71]NYCD IV, 221–24.
[72]New York Colonial Documents (NYCD), Volume IV, 6 December 1700.
[73]J. Franklin Jameson, ed., *Privateering and Piracy in the Colonial Period Illustrative Documents*, Kindle Edition 2012, Doc. 77.
[74]Ibid., doc. 88.
[75]Wartime privateering continued for over a century.
[76]John Taylor, *Jamaica in 1687: The Taylor Manuscripts at the National Library of Jamaica*, ed. David Buisseret (Kingston: University of the West Indies Press, 2008), 89.
[77]Finucane, *Temptations*, 3.

However, Jamaica eventually became the major sugar-producing island in the Caribbean. A power struggle emerged between planting interests in Kingston and the privateers in Port Royal. The island was hard to govern, evidenced by the constant churn of governors in the 1670s and 1680s. Opposition to the Royal Atlantic Company's monopoly from both factions is often what kept the peace.[78] By the 1690s, Kingston began to supplant Port Royal. The Royal Navy moved operations across the bay, and Kingston won fights for hospitals and other construction.[79] Jamaica was one of the few colonies to start cracking down on privateering prior to the Nine Years War. In 1682, Morgan argued that privateering and piracy inhibited trade, in particular supplying, "Negroes to the American colonies of Spain."[80] The legal code in 1687 stated that "Anyone giving shelter to a pirate or privateer shall be seen in league with them."[81] However, privateering from Jamaica did not stop until the early eighteenth century.[82] Still, Jamaica encapsulates the shifting coalitions necessary to reorient from an economy based on access to Spanish gold to one based on the plantation complex and its attendant effects on sea raiding.

During this period, piracy came to be defined in consistent and enduring ways, establishing it as a stable legal category that persists to this day. In 1699, the English Parliament passed the *Act for the More Effectual Suppression of Piracy*. It was the first time that the term *hostis humani generis* appeared in English law to describe sea raiders.[83] The law was part of a rhetorical move to paint sea raiders as the "villains of all nations." By the early years of the eighteenth century, many sea raiders embraced their new status as *hostes humani generis*, the "dregs of mankind," "varmints," and "Sea Monsters."[84] Pirates took roughly 2,400 English ships in the years 1716–26, the "golden age of piracy," more than the privateering ventures of any state during the war without the corresponding captures. The resulting counter-piracy campaign extended centralized courts into the colonies, standardized colonial governance across the empire, and attempted to bring colonial inhabitants into the body politic. The campaign's eventual success enshrined *hostis humani generis* into the law of the sea in the form of universal jurisdiction. Universal jurisdiction allowed any legally sanctioned entity to apprehend pirates and try them regardless

[78]Swingen, *Competing*, 88–95.

[79]Pratik Chakrabarti, *Materials and Medicine: Trade, Conquest and Therapeutics in the Eighteenth Century* (Manchester: Manchester University Press, 2010), 59–64.

[80]He is talking about the RAC. Wafer, *New Voyage*, xxiii.

[81]Taylor, *Jamaica*, 294–95.

[82]Governor Archibald Hamilton handed out letters of marque following the war, See TNA Admiralty Papers (ADM) 1/1471; CO 137/11.

[83]It had previously been utilized to castigate tyrants, Harry Gould, "Cicero's Ghost: Rethinking the Social Construction of Piracy," in *Maritime Piracy and the Construction of Global Governance*, ed. Jon D. Carlson, Mark T. Nance, and Michael J. Struett (New York: Routledge, 2012).

[84]TNA CO 5/869, f.401. Marcus Rediker, *Villains of All Nations: Atlantic Pirates in the Golden Age* (Boston: Beacon Pres, 2004), 13.

of nationality. The French could capture an English pirate and the English would not, as they might have in decades previous, retaliate. The pirate was excluded from civilization as the terrorist is today.[85]

Eventually a new vision of empire based around plantations took hold. While offensive missions were failing, English colonies such as Barbados, Jamaica, and Tobago independently became centers for sugar, tobacco, and cotton.[86] Eventually England would overtake Spain as the major power in the region even as Spain continued to hold its gold (and silver) producing colonies into the nineteenth century. As Whig politician Arthur Maynwaring put it, "if we *cou'd* obtain either by *Treaty* or by *Conquest* those *Golden Mines* we dream of, they wou'd not be half so advantagious to us, as the bare Liberty of Trading."[87] A pamphlet from the 1690s declared that the plantations' "Production is all clear Gains to this Nation, and better than the Mines of Gold and Silver are to the Spaniard."[88] Here trade was being compared to gold. It was not a choice between trading or not trading but between trading and trying to access gold. Trade, unlike accessing Spanish gold, requires peace. Therefore, a political economy built around the plantation complex had no place for sea raiding, giving energy and eventual efficacy to counter-piracy campaigns, relegating private violent actors to the geopolitical margins, and driving them from sustainable economic positions.

Disease had one final crucial impact in fueling the economic transformation of the colonies: it incentivized the slave trade. Colonial sugar production could not have happened on the scale that it did without slaves. Europeans tried to settle in Africa in the sixteenth century, but disease prevented stable colonies. However, they noticed that disease was not decimating the local population. Using nineteenth century data, Philip Curtin shows that African migrants to the New World outlived European migrants 3.2:1.[89] The numbers are incomplete, but there was a contemporary idea, backed by anecdotal evidence and racism, that West Africans were immune. Doctors had begun to tie disease to race and gender with "white" and "black," "male" and "female" diseases.[90] There were other options for plantation labor, namely indentured servants, and "traditional" laborers from England. However, there was a belief that plantations would drain needed labor from England. Indentured servants were cheaper than slaves, but Europeans died earlier and, those that did not die, eventually

[85]Thorup, "Enemy."
[86]TNA CO 1/21, f.337–40.
[87]Steve Pincus, "Rethinking Mercantilism: Political Economy, the British Empire, and the Atlantic World in the Seventeenth and Eighteenth Centuries," *The William and Mary Quarterly* 69, no. 1 (2012): 27. The italicized emphasis is ours.
[88]Swingen, *Competing*, 145.
[89]Philip D. Curtin, "Epidemiology and the Slave Trade," *Political Science Quarterly* 83, no. 2 (1968): 206.
[90]Seth, *Difference and Disease*.

worked off their sentence.[91] Officials worried about racial balance and colonial defense schemed to get white servants and settlers into the West Indies but failed. Even when white servants were available, planters used their money on slaves.[92]A vicious circle built on racism and common wisdom as much as on science. Disease favored conditions for African slavery while slavery, by ensconcing plantations, favored disease.

A counterfactual analysis ties disease, slavery, and the plantation economy together. As cited, contemporary sources actively indicated a preference for African slaves based on their immunity. This is another manifestation of immunity outsourcing, even if those to whom immunity was outsourced did not benefit from the arrangement. It is improbable that the degree of concern expressed in these sources over the fortitude of labor would have been obtained without the threat posed to Europeans performing the same work. Providing plantations with slaves meant the development of the infamous "triangular trade," whereby England would take goods to Africa, exchange them for slaves that it took to its colonies, and then exploited slave labor for plantation crops to be taken to England. For the triangular trade to work, sea raiding had to be eradicated. Trade needed to be regular, reliable, and free. While the slave trade meant more ships on the water for longer periods of time, creating more targets for pirates, it also meant more profits and beneficiaries and, thus, more people whose fortunes and livelihoods relied on secure trade routes.

Disease thus generated the conditions for the rise of privateering as a geopolitical instrument, the fall of privateering into the category of piracy, and the structural transformation of the Atlantic economy from extraction to plantation. Coincident with this period was a significant increase in state capacity, both infrastructurally and culturally, in terms of the justificatory narratives available for state-building and power-centralizing projects.[93] This establishes much of why and how the suppression of piracy was possible: stronger European and colonial forces developed the capacity to consistently target and eliminate bandits on sea and on land. In this sense, the elimination of piracy was not different from any other state-building project in any other period of history where the imposition of order in the hinterlands was a drawn-out process linked to institutional growth and capacity. Yet it does not explain why sea raiders and buccaneers were once essential allies. It is not the case that all state-building projects in any other period of history involved contracting with private providers of violence; nor does it explain why the elimination of piracy

[91]Curtin, "Epidemiology," 207. Sidney Mintz, *Sweetness and Power: The Place of Sugar in Modern History* (New York: Penguin, 1985), 52–53.

[92]Swingen, *Competing*, 166–71.

[93]Brewer, John. *The Sinews of Power: War, Money and the English State 1688-1783* (Routledge, 2002). Matthew Norton, "Classification and Coercion: The Destruction of Piracy in the English Maritime System," *American Journal of Sociology* 119, no. 6 (2014): 1537–75.

became a priority when existing arrangements could perhaps have been sustained.

In other words, we have offered a contributing rather than competing explanation to those that focus on state-building and state capacity, aimed at positioning immunity outsourcing within a broader configuration of causes and processes. While not the only factor, disease was both an ecological outcome and environmental pressure that conditioned the activities of European powers in their colonies, in ways that do not fit neatly into conventional security studies or state transformation analytical frameworks. In the next and final section, we consider the broader lessons that can be drawn from recognizing and exploring this.

Eco-Centric Security Studies and Ecological Mechanisms

The foregoing account does not supplant other explanations for the transformation of colonial political economy and the exclusion of private actors from military affairs, but it does supply a crucial missing dynamic: the management of disease and its implications. We have emphasized the mechanism of immunity outsourcing, but it is embedded in a broader ecological framework that emphasizes types of causal relationships and processes that arguably are present in all processes of state transformation. We show that yellow fever and malaria exerted profound pressures on the behavior of all actors—on European states, on colonists, and on private violent actors. We also show that these diseases themselves are the outcome of other processes of state transformation, as they were introduced as part of early colonial settlement processes brought by slavers and their cargo. In other words, disease functions similarly to features of terrain such as mountains or bodies of water in conditioning strategy and geopolitics, and in that sense, can itself be treated as a form of terrain. It is microbial rather than geographic but unlike those features of the world, it can be significantly altered by human activity. Disease features significantly in other landmark studies of state transformation, such as in explaining the decline of the Asian "world system" as a result of plague, but our case shows how it can oblige adaptations and institutional evolutions on much shorter time scales.[94] A probabilistic analysis of competing hypotheses implies the history of Atlantic colonization and Caribbean competition would look very different if those two diseases had not taken a strong hold, and if an immunity to them, or the absence thereof, had not been so central to military outcomes in attempts at conquest and extraction.

[94] Janet L. Abu-Lughod, *Before European Hegemony: The World System AD 1250-1350* (Oxford University Press, USA, 1991).

The implications of our case bear on a number of assumptions that, while not ubiquitous in security studies, are commonly made by observers of military and geopolitical affairs. The first two are ontological. The case calls into serious question the dual assumptions of unit homogeneity and continuity. Something as simple as resistance to a specific pathogen over time led to differentiated unit functions and eventual changes across entire unit arrangements over time and space. An eco-centric view of security, as noted in the earlier theoretical framing, depicts a world in motion and assumes that such changes are the norm and that homogeneity and continuity are exceptions to be explained rather than parameters to be assumed. The case also shows the *reciprocity* of environmental conditions and human adaptations to them. Yellow fever and malaria were not merely pressures that forced Atlantic and Caribbean colonists and imperial forces to manage immunity and lack thereof. They were themselves the *consequence* of colonization and imperial geopolitics. While climate change is perhaps the example *par excellence* of human activity generating environmental feedback that generates subsequent strategic problems, an eco-centric view of security allows us to find other significant examples that scholars might otherwise overlook, and properly frame their causal or geopolitical position.

The second two implications are methodological. Security scholars may find that the search for reliable causal relationships is very difficult without reliable regularities in units, environmental parameters, or processes of change over time. An association that obtains for a given period may, as a result of rapid ecological change or political adaptation to new environmental conditions, simply stop. Correlational analyses are thus analytically limited—a problem that goes far beyond questions of method and into the territory of epistemology itself. Moreover, research design must be ecologically self-aware: framing and posing research questions requires self-conscious reflection on a broader set of processes that establish scope conditions at a given time or place, but which may alter those conditions during the period under scrutiny. This pushes scholars in the direction of relational sociology, complexity theory, and other nonindividual models of security and society, with attendant reliance upon single case analysis. Comparison across many cases, conversely, looks like a methodologically risky research strategy, as an eco-centric view suggests that they will likely differ in key parameters, and considerable labor would be necessary to manage this.

Finally, there is perhaps a suggested analogy relevant to the study of cybersecurity: if "cyber" is an environmental space, then it too should be viewed ecologically. Immunity outsourcing is not inconceivable as a response to computer viruses, in cases where, for example, government bureaucracies with sprawling computer systems vulnerable to hacking or software viruses outsource some sensitive work to private actors with lower

profile and more secure systems. Periodic leaks of "offensive" software tools are in some ways analogous to the migration or evolution of biological disease, and "hardening" systems—rather than, say, targeting the specific malicious actors likely to employ those tools—is analogous to the development of immunity. The increasing capacity of private actors to gather sensitive information and market it is in some ways analogous to privateering or piracy and occurs within a context of evolving parameters and digital infrastructure. In other words, the case-specific insights we offer, and the more general ones associated with the eco-centric view of security we propose, are relevant to more than just our historical appreciation of colonialism, and to more than just the actual microbial and climatological forces that condition geopolitical possibilities.

Conclusion

The significance of the environment to geopolitics and state formation is well recognized in existing literature, but an eco-centric view of security is much less so. We have drawn on relational ontology and an evolutionary understanding of human-environment interactions to develop a more comprehensive approach to understanding how actors encounter, manage, and resolve threats, and how their solutions feed back into the environment. This eco-centric view allows us to reexamine the history of modern state formation in the New World, during an era of colonial and imperial contestation amongst European states and their Atlantic territories. By focusing on the threat of disease, itself generated by colonization, and the strategic mechanism of immunity outsourcing, we traced a process responsible first for the rise of privateering, as a category of semi-private violence, then of the emergence of piracy as a proscribed category of fully private violence subject to extensive attempts at suppression. That same process also fundamentally contributed to the development of the plantation economy and the triangular trade—an arrangement that led directly to the international and domestic situations of the New World today.

Our goal in this has been two-fold. First, we hope to have clarified an historical episode of great significance, ensuring that an often-overlooked dimension of it receives more adequate attention. As the world today rebuilds from a disease-driven recession and seeks to manage the still-ongoing threat to public health that disease poses, security scholars can only benefit from a more granular historical familiarity with the ways past institutions have navigated disease and geopolitics. Second, we have offered an analytical framework for understanding the relationship between environment and security in ways we see as helpful to ongoing discussions in security studies, notably those considering the developing role of cybersecurity and digital spaces as domains of conflict, contestation, and

essential infrastructure. Ecological models offer complex, recursive, and multicausal ways to represent and trace the role of geography beyond the initial parameters it sets, and to consider the role of nonhuman agents such as pathogens, whether microbial or algorithmic. The stopping power of disease is as much also a "starting" power, as it generated, and still generates, the conditions for significant transformations in states and economic structures. This is evident from the perspective of the eco-centric view of security we propose, and we hope it equips other scholars to better navigate and employ related literature in political geography, science and technology studies, and relational sociology.

Disclosure Statement

No potential conflict of interest was reported by the author(s).

Funding

This work was supported by the Horowitz Foundation for Social Policy; University of Cambridge.