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# JAMS

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## The Cyber Sea Conflict and Security

Major Kevin Doherty, USA

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**Abstract:** The interchange that drives world economics in the past now intersects with and will rest on the electromagnetic spectrum's (EMS) structure that includes cyberspace. Historically, the world's oceans played this crucial role in great power competition, but today that key geography now sits within the EMS's exponential exchange in services between nations for maximal productivity output in free and open markets. The U.S. military must help sustain these crucial lines of communication to channel the spirit and capacity of their nation's people into the new activities that war calls for and efficiently employ them against a threat. Sea lines of communication were of foremost importance in this regard until now, when the EMS, tapped by cyberspace, connects the most amount of people and their productivity to win the next conflict. Cyberspace has consumed the sea.

**Keywords:** cyber power, seapower, sea lines of communication, SLOC, electromagnetic spectrum, EMS superiority, terrain-based strategy, threat-based strategy

The 2018 U.S. *National Defense Strategy* states that the “long-term strategic competitions with China and Russia are the principal priorities for the [Defense] Department.”<sup>1</sup> To this end, the U.S. military prepares a threat-based response to wage a great power competition.<sup>2</sup> That focus sacrifices the here-and-now of a terrain-based response in favor of countering a potential threat. Instead, more must be done to ready the force for present realities. An analysis of the British Empire in its heyday would serve to assist the United

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States in crafting a better security architecture, one embracing a terrain-based model of security, as opposed to a threat-based model.

At the time of the British Empire, the key terrain was the sea. Access to the maritime domain was the critical factor that allowed Britain's military to gain a marked advantage over its adversaries by securing economic gains across the globe. Arguably, the United States kept this focus during the Cold War, i.e., U.S. Cold War strategy did not focus on the Union of Soviet Socialist Republic's (USSR) defeat in a land war but rather on bolstering an economic and even political exchange among as many nations as possible throughout the world.<sup>3</sup> That influential U.S. terrain-based strategy that depended on sea lines of communication shifted after the tragic 11 September 2001 (9/11) attack on U.S. soil as the military's focus became countering the global terrorism threat. Years later, the current U.S. military strategy still ignores seeing terrain as the key to setting strategy to enhance the interdependent relationship between the economic market and augmenting military power.<sup>4</sup> That insight speaks to the focus of this article: the need to align economic vitality with the military mission during times of peace *and* war. The nation that does so distributes resources efficiently, creating continuous economic development and military effectiveness. Britain was able to keep this appreciation of the state's employment of resources foremost in mind during the height of their empire, leading to decisive results. The United States must do the same when contemplating how best to position itself to prevail in today's conflict at sea.

The question becomes how best to do so. Cyberspace provides the answer. Despite the U.S. Department of Defense's traditional divide by organization and doctrine, now between electronic warfare and cyber operations, both lines of effort attempt to dominate aspects of the electromagnetic spectrum (EMS) that transmit packets of information.<sup>5</sup> The EMS is much more than radio frequencies and includes the infrared light frequencies that enables ethernet fiber-optic cable connections critical to today's networks. The electromagnetic spectrum's physical ability to facilitate commercial transactions and more broadly human interchange makes the EMS the critical terrain of today. The exponential speed and quantity of service transactions facilitated by the EMS mirrors the British use of the world's waterways in supporting its empire. The United States must safeguard that digital infrastructure to maintain the international norms and practices that sustain the liberal world fashioned after 1945. The British Empire implemented a successful terrain-based military strategy to maintain economic market stability. The United States would yield greater benefits by adopting a similar strategy. Analyzing the British Empire at its peak reveals the myopia plaguing the current U.S. threat-based strategy. Economic considerations must be pulled into the analysis via the key terrain of cyberspace.<sup>6</sup> Cyber power now, as seapower once did, best addresses the economic realities at the core of any military strategy.

U.S. government publications, later addressed in this article, reveal some tentative steps in the direction of paralleling cyber and seapower when trying to

define the EMS. However, that effort is understandably nascent and therefore incomplete. How best to handle cyber realities and how that technology best relates to the EMS will be clearer in the years ahead, probably many years in the future. This article helps align that thinking in terms of a needed military outlook in cyberspace. This conceptual building is underway, and the parallels established here in relation to the British Empire provide some much-needed context. Honing and improving thinking in this regard grows out of the British Empire's efforts at its height of using sea power to help broker a more stable world. Some famous studies undergird this analysis, from Adam Smith's seminal and immensely influential work presenting the virtues of free trade, *The Wealth of Nations*, to tracking the impact of his compilation on Alfred Thayer Mahan's famous history, *The Influence of Sea Power upon History*. These almost now primary sources are abetted with key scholarship, such as Julian Corbett's *Some Principles of Maritime Power* and Paul Kennedy's important history, *The Rise and Fall of Great Powers*, a comprehensive study but one centering great power discussion on the British Empire. Valued studies of the British Empire include Ashley Jackson, *The British Empire* and Lawrence James, *The Rise and Fall of the British Empire*.<sup>7</sup> Altogether, these sources provide a great point of departure to further consider how the sea may well yield crucial attributes and traditional power venues to the vast openness of cyberspace.

## The British Empire at Its Peak

The British Empire maintained a terrain-based strategy that secured the economic market, preventing the enemy from damaging or destroying society's ability to connect and facilitate a surplus exchange of goods and services to then maximize societal development. The strategy required the military to concentrate on protecting the economic market no matter what the enemy did. The results were impressive. From the mid- to late-eighteenth century and until the 1950s, the British Empire was the world's most prominent political entity, an economic juggernaut, and a powerful military and strategic alliance leader. Of the world's 209 nation-states, 63 were once ruled by Britain. The territories that formed the British Empire ranged from tiny islands to vast segments of the world's major continents, including the Americas.<sup>8</sup> This collection of overseas possessions relied on alliances with the indigenous leaders, elites, and the many people employed by the sovereign. In James Lawrence's *The Rise and Fall of the British Empire*, he summarizes this reach: "The achievements, however, cannot be denied, and during its heyday, the British Empire was the envy of the world."<sup>9</sup> Due to the British Empire's investment in security, people from any land could invest in themselves, focus on their labor productivity, and make money by operating within the empire's bounds all by virtue of British security.<sup>10</sup> The British Empire attained its powerful status largely because of its terrain-based strategy that secured economic development in peace and war. As another expert wrote, "the eighteenth-century British strength was its policy connection, primarily on military means, to project global trade, financialization, and protectionism."<sup>11</sup>



Many attribute the British Empire's success to maritime power advancing trade made possible by controlling sea trade. Most famously, in *The Influence of Sea Power upon History, 1660–1783*, Alfred Thayer Mahan points to England's terrain-based strategy to secure the economic market. Mahan writes of sea power in 1763:

The policy in which the English government carried on the war is shown by a speech of [William] Pitt, the master spirit during its course, though he lost office before bringing it to an end. Condemning the Peace of 1763, made by his political opponent, he said: "France is chiefly, if not exclusively, formidable to us as a maritime and commercial power. What we gain in this respect is valuable to us, above all, through the injury to her which results from it. You have left to France the possibility of reviving her navy." Yet England's gains from this agreement were enormous; her rule in India was assured, and all North America east of the Mississippi in her hands. By this time the onward path of her government was clearly marked out, had assumed the force of a tradition, and was consistently followed.<sup>12</sup>

William Pitt ("the Elder") is a towering figure in the history of the British Empire. However, even he could not deter the British Empire decision makers from understanding that the inherent stability born of sea control or denial was the most important factor to winning a future war, not the capabilities of future threats.<sup>13</sup> Mahan underscores the British government's ability to set this policy in motion when he notes, "Both houses of Parliament vied in careful watchfulness over its extension and protection, and to the frequency of their inquiries a naval historian attributes the increased efficiency of the executive power in its management of the navy."<sup>14</sup> A terrain-based strategy had come to dictate British policy resting in the hands of the navy and would remain in place for a very long time.

The British Empire's determination to secure the economic market proved to be successful in peace and war. In peace, that strategy provided stability and confidence that yields the benefits Adam Smith desired: the division and specialization of labor that in turn benefits society.<sup>15</sup> In recent times, scholar Joseph Nye, in an opinion piece with CNN, accurately illustrates that same sentiment, writing that military power provides a degree of security as oxygen is to breathing, something little noticed until it becomes scarce, at which point its absence dominates all else.<sup>16</sup> Similarly, another renowned scholar, Paul Kennedy, in his tome, *The Rise and Fall of the Great Powers*, mentions that great power status changes are determined by whether the "state's economy had been rising or falling, relative to other leading nations, in the decades preceding the actual conflict."<sup>17</sup> Kennedy warns of military power overextension, but his focus on conflict among great powers fails to recognize that military power is not just

for war preparation. Ashley Jackson depicts the more significant benefit of military security: “equality of access to markets sounded fine in theory; in practice, however, Britain was the country in by far the best position to take advantage of it. Underpinning this unique system of overseas settlement and commercial relations was the supremacy at sea of the Royal Navy, vital for the growth and security of the British Empire.”<sup>18</sup> Jackson’s clarity of the key role of seapower accurately applies to Kennedy’s call for efficient employment of state resources but expands the notion of security as something more than just winning wars. A military projection of power must align with the security requirements of the expanding market during times of peace as well. The market provides funding for sustaining security, and security encourages economic expansion. That relationship is cyclical, concrete, and durable should one make the effort to uphold the relationship as consistent state policy. No matter the obvious gains from the approach, getting offtrack occurs too often.

Mahan further depicts the synchronized effects of British strategy and the benefits in peace:

The needs of commerce, however, were not all provided for when safety had been secured at the far end of the road. The voyages were long and dangerous, the seas often beset with enemies. In the most active days of colonizing there prevailed on the sea a lawlessness, the very memory of which is now almost lost, and the days of settled peace between maritime nations were few and far between. This arose the demand for stations along the road, like the Cape of Good Hope, St. Helena, and Mauritius, not primarily for trade but for defence and war; the demand for the possession of posts like Gibraltar, Malta, Louisburg, at the entrance of the Gulf of St. Lawrence—posts whose value was chiefly strategic, though not necessarily wholly so. Colonies and colonial posts were sometimes commercial, sometimes military in their character; and it was exceptional that the same position was equally important in both points of view.<sup>19</sup>

As Mahan points out, the British Empire balanced security and economic development, seeking synchronization among the military and commercial markets. The broadest need proved self-evident. How best to make the connection work is less clear but possible should state policy attempt the effort in times of peace and war.

The emphasis on a terrain-based task to secure the economic market was validated in the 1714 Treaty of Utrecht that marked Britain’s rising status, exemplifying its military power as that of securing economic production. Its global gross domestic product (GDP) started to increase against that of the French and Spanish.<sup>20</sup> The British Empire’s concentration of force beyond its shores grew merchant shipping and sparked wealthy colonial cooperation. That early

strategy propelled economic market extension by connecting more people, all made possible by the military support that secured the sea. War would be a measure of that security, a new expression of peace that set Britain on a path to great power status.

In contrast to the success of the British Empire's strategy, both Spain and France experienced a significant loss in power. Spain's military strategy focused on preserving the crown's wealth, failing to spread that wealth and security among its people and their goods. The Spanish navy eventually paid the cost, as the massive British naval force, made possible by focusing on people, allowed Britain to surpass the Spanish fleet in numbers and quality of seamanship.<sup>21</sup> The French viewed the military as an instrument to win a great conflict, not provide security, which led to the belief that the navy was a subordinate arm to military considerations on land. The French decision makers avoided investing money into ships to economize their fleet and assume a defensive position around France proper. All the while, they invested lots of capital in their large army.<sup>22</sup>

While its chief opponents faltered when crafting policy, the British Empire grew economically and in military effectiveness. The synchronization between these two efforts proved to be equally decisive in providing security and waging war. This balance was not easy to achieve. As Geoffrey Till's book, *Seapower: A Guide for the Twenty-First Century* eloquently explains, the British Empire's maritime infrastructure was not only maintaining the security of trading routes but also meant the unprecedented reach of military force: "the absolute supremacy of the British navy gave it such inordinate power far beyond its numerical strength, because 200,000 men embarked in transport, and by God only knowing where they might be put ashore, was a weapon of enormous influence and capable of deadly blows."<sup>23</sup> This statement illustrates that the same security apparatus for economic development quickly converts to significant military effects in a time of conflict. In similar fashion, Kennedy complements the periphery attacks undertaken by the British Empire, all made possible given its employment of financial support to form strategic alliances with other powerful states to then demonstrate the substance of Britain's maritime and continental strategy. His reasoning shows the British Empire's complementary rather than antagonistic efforts to marry commercial gain with military purpose:

Frederick the Great for example, received from the British the substantial sum of 675,000[£] each year from 1757 to 1760; and in the closing stages of the Napoleonic Wars the flow of British funds reached far greater proportions (e.g., 11 million to various allies in 1813 alone, and 65 million for the war as a whole). But all this had been possible only because the expansion of British trade and commerce, particularly in the lucrative overseas markets, allowed the government to raise loans and taxes of unprecedented amounts without suffering national bankruptcy.<sup>24</sup>

Kennedy's emphasis on financial gain sets the productive powers of the state alongside an expanded market, allowing more people to produce (whether in taxes or products) and support the war effort. The payment to mercenaries and allies, the transport of raw material or trading products, and the freedom to employ the army all depended on securing the ocean's avenues of approach on the sea lines of communication.

The British Empire's ability to use its military to secure the economic market led to the empire's consistent attention to including more people from all classes, a means that required the military to foster stability, allowing the state to garner the individual's trust to then maximize their production and support surplus exchanges to achieve constant economic development and sustain military effectiveness. Sea shipping's ability to service large surplus quantities of goods and connect the greatest number of local markets came from the British Empire's access to sea lanes, and then came the claim to overall ocean dominance. The military protected that connection and facilitated an exchange anchored on the sea lines of communication. In sum, the British Empire's military employed a terrain-based strategy.

## **EMS Superiority**

After 1945, the U.S. military assumed the authority and responsibility to protect the free exchange of goods and services across the globe.<sup>25</sup> With that mandate, the British Empire's model remained intact, until now. Some of that regress stems from circumstance. The ocean's advantageous characteristics to connect the most amount of people with large surplus quantities transitioned with the onset of the information revolution.<sup>26</sup> Consequently, today the economic market's decisive point is the electromagnetic spectrum (EMS), the collection of electric and magnetic waves found in the cables that connect computers, the wavelengths that connect cellphones, and the radio waves that connect satellites.

The U.S. military's *Department of Defense Dictionary of Military and Associated Terms*, Joint Publication 1-02, defines a decisive point requiring military attention as "a geographic place, specific key event, critical factor or function that when acted upon, allows commanders to gain a marked advantage over an adversary or contribute materially to achieving success."<sup>27</sup> The EMS is such a decisive point. It has exponentially increased the market and rapidly increased societal advancement. Connecting more people in cyberspace allows for more frequent exchanges of services to meet needs regardless of distance. The EMS can be understood as an economic supply chain rendering information as a commodity that allows a high yield of return from information flow. The physical world offers a plethora of data of varying sorts: imagery, audio, and thermal. But data is not productive until it supplies the needs or wants of a consumer. Turning data into an information commodity requires its cultivation, manufacturing, transport, distribution, and consumption to be productive. Therefore, the EMS should be the military's decisive point when called to advance or protect economic stability, that is, secure national security.<sup>28</sup>

Information passed in the EMS transports itself along trade routes (specific frequencies: electric and magnetic waves) just as it occurs at sea with other goods. The information is received (depending on frequency, power, time, and location) and distributed to the consumer.<sup>29</sup> When the information commodity is received, the linear progression is complete. This frequency-delivered information commodity also smacks of military implications. It provides “positioning, navigation, imagery, communication, intelligence, weather, and engagement of the enemy beyond visual range.”<sup>30</sup> However, just as at sea, the duality is as apparent. Any EMS exchange is valued like money and that exchange is possible with secure access and trading routes. The synchronization that drove the British Empire has resurfaced in cyberspace.

Much like the cognitive signal and multiplying effects of money, the information commodity is a force multiplier to the efficient employment of a nation's resources. Adam Smith explains that an individual can only produce a small part of his necessary demands and requires a supplemental exchange to fulfill all their necessities.<sup>31</sup> This crude exchange faltered in operation until the invention of money. Money provides durability in value and ease in transport that can be divided to meet the equitable quantity of multiple demands.

Additionally, the information commodity achieves the desired effect to employ resources appropriately to then meet demand, but at a much faster speed and greater distance than has been possible before the transmission on the EMS. Achieving EMS superiority now becomes a military task, specifically protecting the unfettered information flow and assured access across the electromagnetic spectrum frequencies—a need the U.S. military fortunately recognizes.<sup>32</sup> EMS power, much like seapower, profoundly influences the wealth and strength of a nation, which fosters a constant clash of interests as nations compete to gain a larger share and control of the information flow.<sup>33</sup> Although the physical effects of war occur on land, sea, and air, these effects are exponentially modified by the conduct and the relative productive value of a nation's EMS superiority. EMS superiority enables the global economic market to connect and efficiently facilitate the exchange of supply and demand to increase economic development faster and further than at any time in history. In this way, the EMS offers similar characteristics to the ocean and possesses an obvious need. What Britain had secured at sea must now be a security a state looks to achieve in cyberspace.

This need can be taken further. The commodity of information provides universal value to the world's labor force. Security of that functionality breeds military imperatives. The EMS as dictating an information exchange means combat resources as a means of a whole of government policy correlates to the British Empire's use of its military at its best. The military was at its peak when offering security to a system that used a naval strategy to protect the productive value of state investments in the commercial interchange. As Mahan states, “England by her immense colonial Empire, has sacrificed much of this concentration of force around her shores; but the sacrifice was wisely made, for the gain was greater than the loss, as events proved. With the growth of the



British colonial system, its war fleets grew, but its merchant shipping and wealth grew faster.”<sup>34</sup> The British Empire found lasting success by making significant investments in protecting the economic market resting on the decisive sea trade routes. The global EMS trade routes continue to diversify and expand to connect the exchange in services, demanding protection as a guarantee to open and free access to trade in their own right.

## **A Terrain-Based Strategy**

On 11 September 2001, the United States experienced a catastrophic terrorist attack and the U.S. military’s primary concern quickly became confronting terrorism. Due to this threat-based focus, the U.S. military restructured and developed capabilities to combat this problem. While a response was warranted, the rush to embrace a terrorist threat had costs. In the words of the *National Defense Strategy* summary of 2018, that new focus led to “a period of strategic atrophy.”<sup>35</sup> With the United States engaged elsewhere, both China and Russia enjoyed economic development, with China nearing comparable U.S. GDP levels and gaining global economic influence. As evidenced by China and Russia’s modernization efforts, it is becoming clear that both countries “want to shape a world consistent with their authoritarian model.”<sup>36</sup> This development has led to another fundamental shift in U.S. military strategy from a counter-terrorism threat-based approach, to a great power competition that also seeks to engage defined threats. In sum, the United States has traded one threat-based task for another. This focus could further shrink the U.S. military’s comparative advantage in controlling and protecting the country’s need for free markets.

The change is unneeded. China and Russia resemble the British Empire’s great power competitors France and Spain in that an ability or need to protect the home waters is a limitation unto itself. Michael Beckley highlights this problem:

In a war, China could potentially deny the U.S. military sea and air control within a few hundred miles of China’s territory, but China cannot sustain major combat operations beyond that zone, and the United States retains low-cost means of denying China sea and air control throughout the East and South China Seas as well as preventing China from accomplishing more specific objectives, such as conquering Taiwan.<sup>37</sup>

That military dynamic means that, while China may achieve near parity with the U.S. global GDP share, China’s economic development is dependent upon the very global exchange made possible by U.S. security efforts. Due to China’s dependence on the world’s raw materials and financial commodities, China’s manufacturing could be halted quickly without access to global trade. China’s forfeiture of the global exchange in a war setting means a similar loss of a global exchange of information commodities. That capital available in cyberspace is forfeit as well given China’s determination to establish a Chinese cyber

barrier, the “Great Firewall.”<sup>38</sup> China’s failure to maintain its lines of communication at sea or in cyberspace represents a tremendous vulnerability in times of war.

The same vulnerability is present now in cyberspace. The Chinese “Great Firewall” and censorship restrictions resemble the French strategy to provide naval security only close to their shores and only to protect the markets of France. Much like the French forfeiting the value of trading partners, the Chinese government’s restriction on access to cyberspace means restricted access to the digital free market of ideas. This shortcoming matters. Former U.S. Secretary of Defense Robert M. Gates put it this way:

Counting all categories (including peace, literature, economics, and the sciences), as of 2019 the United States had received 383 Nobel Prizes, the United Kingdom 132, the USSR/ Russia 31, and China 6. All of this contributes to an image globally of the United States as the intellectual and scientific leader. Equally impressive is the fact that more than a quarter of U.S. recipients have been immigrants.<sup>39</sup>

China’s determination to seal off what is deemed inimical information in cyberspace stunts its intellectual development, harming innovation. This lack of societal-intellectual improvement underscores that economics is not just manufactured goods but includes information commodities that depend on global markets to fuel more development. Shrinking from the cyber sea means efficiency is beyond the reach of China as is any claim to great power status.

Russia does not compare to the United States in terms of economic development, but it does boast a military that seeks to achieve operational effectiveness in cyberspace.<sup>40</sup> In that regard, it has mounted a significant challenge in terms of nonviolent actions, as one expert stated, a wholly nonmilitary campaign reaching beyond merely cyberspace.<sup>41</sup> But by pursuing a terrain-based strategy that includes securing the EMS to enjoy trade in cyberspace, the U.S. military will restructure and develop capabilities that will help the U.S. government thwart Russian actions in the digital domain. No matter Russia’s attack on Ukraine, and, more likely, because of Russia’s struggles in imposing a military decision on Ukraine via the violence of invasion, countering the nonmilitary aspects of that state’s power projection will remain a U.S. priority.

Currently, the *Joint Operating Environment 2035* exemplifies the need for a U.S. realignment because that document again states a decisive victory focus in a threat-based model. The document does acknowledge the importance of commerce and information connectivity through the EMS. Nevertheless, the aim is only to secure portions of the frequencies in the EMS, not to secure the EMS as a means of global commerce and partnership.<sup>42</sup> A secure cyberspace would build trust and cohesion with the global economic market. In turn, this achievement would inspire more people to connect and exchange information to then provide goods and services. Protecting a free and open EMS simply

amplifies the benefits of the liberal capitalist market, inspired by Adam Smith, which has proven to be the most effective way to achieve economic development and global security.<sup>43</sup>

Implementing a terrain-based strategy will create and consistently reinforce the world's productive resources. The global, liberal capitalist market backed by the U.S. military and its allies should not fear the emergence of China as a great power. China grew to great power status by adopting and becoming a part of that global liberal market. The major threat to the United States and global stability is the EMS's lack of common security. Protecting the EMS, a terrain-based imperative, is a daunting task, much like securing the vast ocean ahead of the soon-to-be-developed British Empire. Given the needed intersection of economics and military affairs, the United States could trust its allies to assume more of a role in safeguarding significant shares of the land, maritime, and air tasks. This cooperation would allow the United States to focus on the challenge of securing the EMS.

Trusting and managing that global commons, if done effectively, could very well lead to a prosperous, prolonged period of peace. That development, should it come to pass, would be a welcome sight. Britain may well have used sea power to create and maintain its empire, but it did so in too exploitative a fashion.<sup>44</sup> Too many areas of the world suffered to ensure Britain prospered. A series of wars followed. In the cyber age, that negative, concomitant impact of exploitation and strife stemming from globalization may well be averted, at least greatly curtailed.<sup>45</sup> Trading goods, services, and ideas online can be done in parity and equity among the nations of the world. A secure, global online commons is needed first; this terrain is the most important feature of the modern age that may well right the wrongs of the past when realigning seapower with cyber power. Conflict at sea is heading to a virtuous rendezvous in cyberspace.

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## Endnotes

1. *Summary of the 2018 National Defense Strategy of the United States of America: Sharpening the American Military's Competitive Edge* (Washington, DC: Department of Defense, 2018), 5.
2. *The National Security Strategy of the United States of America* (Washington, DC: White House, 2017); and *Summary of the 2018 National Defense Strategy*, 6. See the valuable summary *Renewed Great Power Competition: Implications for Defense—Issues for Congress* (Washington, DC: Congressional Research Service, 2022), 2–3. For the Marine Corps' response to the great power competition mandate, see the active debate, best exemplified by retired Gen Paul K. Van Riper, "The Marine Corps' Plan to Redesign the Force Will Only End Up Breaking It," *Task & Purpose*, 20 April 2022.
3. Melvyn P. Leffler and Odd Arne Westad, "The Emergence of an American Grand Strategy, 1945–1952," in *The Cambridge History of the Cold War* (Cambridge, UK: Cambridge University Press, 2011), 67–68.
4. *Summary of the 2018 National Defense Strategy of the United States of America*, 5.
5. Catherine A. Theohary and John R. Hoehn, *Convergence of Cyberspace Operations and Electronic Warfare* (Washington, DC: Congressional Research Service, 2019).
6. Carl von Clausewitz reminds us that war never comes down to one decisive act and immediate employment of every resource. Consequently, the leading factor in war is

- essentially not exerting military power. However, the military must gain enough time and sustain lines of communication that enable the spirit and capacity of the people of a state to meet any threat. Clausewitz, *On War*, trans. Michael Howard and Peter Paret (Princeton, NJ: Princeton University Press, 1989), 79.
7. Ashley Jackson, *The British Empire: A Very Short Introduction* (Oxford, UK: Oxford University Press, 2013).
  8. Jackson, *The British Empire*, 5.
  9. Lawrence James, *The Rise and Fall of the British Empire* (New York: St. Martin's Press, 1996), inside cover.
  10. Jackson, *The British Empire*, 30.
  11. Paul Tonks, "British Union and Empire in the *Origin of Commerce*: Adam Anderson as Eighteenth-Century Historian and Scottish Political Economist," *Journal of the Historical Association* 105, no. 364 (2020): 61, <https://doi.org/10.1111/1468-229X.12927>.
  12. Alfred Thayer Mahan, "Discussion of the Elements of Sea Power," in *The Influence of Sea Power upon History: 1660–1783* (Gloucester, MA: Dodo Press, 2009), 50.
  13. Julian Corbett, renowned British naval theorist, codified much of this thinking of sea control and denial, centering his discussion on sea lines of communication, less terrain. See Corbett, *Some Principles of Maritime Power* (London, UK: Longman's, Green, 1911), 94–96.
  14. Mahan, "Discussion of The Elements of Sea Power," 51.
  15. Adam Smith, the father of free-market economics, argues that dividing labor tasks creates task proficiency and maximizes product surplus. Smith also mentions the need for defense. If the military did not provide security to the labor force, those engaged in trade would spend far too much time worrying about the risk inherent in the act of trade, particularly at sea. By achieving stability, people follow their self-interest and naturally try to maximize the extent of the market, which allows a greater exchange of goods and a further division and specialization of tasks to improve society. See his famous book, *A Wealth of Nations*, book 1, "Of the Causes of Improvement in the Productive Powers of Labour, and of the Order According to Which Its Produce Is Naturally Distributed Among the Different Ranks of the People," chap. 2, *Of the Principle Which Gives Occasion to the Division of Labour* (London, UK: n.p., 1776).
  16. Joseph S. Nye, "Has Economic Power Replaced Military Might?," CNN, 6 June 2011, 5.
  17. Paul M. Kennedy, *The Rise and Fall of the Great Powers: Economic Change and Military Conflict from 1500 to 2000* (1987; repr., London, UK: William Collins, 2017), 13.
  18. Jackson, *The British Empire*, 15.
  19. Mahan, "Discussion of the Elements of Sea Power," 32.
  20. Kennedy, *The Rise and Fall of the Great Powers*, 182.
  21. Mahan, "Discussion of the Elements of Sea Power," 39.
  22. Alexander Mikaberidze, *The Napoleonic Wars: A Global History* (Oxford, UK: Oxford University Press, 2020), 27–28.
  23. Geoffrey Till, *Seapower: A Guide for the Twenty-First Century* (New York: Routledge, 2018), 70.
  24. Kennedy, *The Rise and Fall of the Great Powers*, 171.
  25. Historian Melvyn P. Leffler stresses how the United States mirrored Britain's economic and technological process when setting course after 1945, much as Paul Kennedy laid out in *The Rise and Fall of Great Powers*; and Leffler, *A Preponderance of Power: National Security, the Truman Administration, and the Cold War* (Stanford, CA: Stanford University Press, 1992), introduction, ii.
  26. Milton L. Mueller, *Networks and States: The Global Politics of Internet Governance* (Cambridge, MA: MIT Press, 2010), 1; and in more of a war setting, Eli Berman, Joseph H. Felter, and Jacob N. Shapiro, *Small Wars, Big Data: The Information Revolution in Modern Conflict* (Princeton, NJ: Princeton University Press, 2018), 320–24.
  27. *Department of Defense Dictionary of Military and Associated Terms*, Joint Publication 1-02 (Washington, DC: Department of Defense, 2010), 61.
  28. Department of Defense doctrine almost defines the EMS as key terrain when outlin-

- ing the “Modern Electromagnetic Operational Environment.” See the *Electromagnetic Spectrum Superiority Strategy* (Washington, DC: Department of Defense, 2020), 4.
29. Kevin C. Darrenkamp, “The Military Battles for Electromagnetic Spectrum Superiority,” *Army Lawyer*, no. 34 (July 2000): 34–37.
30. Darrenkamp, “The Military Battles for Electromagnetic Spectrum Superiority,” 34.
31. Smith, *The Wealth of Nations*, book 1, “Of the Causes of Improvement in the Productive Powers of Labour, and of the Order According to Which Its Produce Is Naturally Distributed Among the Different Ranks of the People,” chap. 4, “Of the Origin and Use of Money.”
32. *Electromagnetic Spectrum Superiority Strategy*, 3.
33. Mahan, “Discussion of the Elements of Sea Power,” 18.
34. Mahan, “Discussion of the Elements of Sea Power,” 33. Despite their differences, Corbett parallels Mahan here when discussing the limited gain from “military victory” on land and sea. See Corbett, *Some Principles of Maritime Strategy*, 95.
35. *Summary of the 2018 National Defense Strategy of the United States of America*, 1.
36. *Summary of the 2018 National Defense Strategy of the United States of America*, 1.
37. Michael Beckley, *Unrivaled: Why America Will Remain the World’s Sole Superpower* (Ithaca, NY: Cornell University Press, 2018), 11. China’s problems limiting its development are in Timothy Beardson, *Stumbling Giant: The Threats to China’s Future* (New Haven, CT: Yale University Press, 2013), 2; and Minxin Pei, *China’s Trapped Transition: The Limits of Developmental Authoritarianism* (Cambridge, MA: Harvard University Press, 2009), 8–9.
38. Robert M. Gates, *Exercise of Power: American Failures, Success, and a New Path Forward in the Post–Cold War World* (New York: Alfred A Knopf, 2020), 402.
39. Gates, *Exercise of Power*, 43.
40. Gates, *Exercise of Power*, 406.
41. Mark Galeotti, *Russian Political Warfare: Moving Beyond the Hybrid* (New York: Routledge, 2019), introduction, i.
42. *The Joint Operating Environment 2035: The Joint Force in a Contested and Disordered World* (Washington, DC: Joint Chiefs of Staff, 2016), 31. Again, a shortsightedness embedded in doctrine, as was the case in the EMS strategy mentioned earlier in *Electromagnetic Spectrum Superiority Strategy*.
43. See those predicting the digital system would benefit the world. Most famously, Francis Fukuyama, *The End of History and the Last Man* (New York: Avon Books, 1992), xi–xii. See also Samuel P. Huntington, *The Third Wave: Democratization in the Late Twentieth Century* (Norman: University of Oklahoma, 1991), 58, 316.
44. See the recent condemnation of the British Empire in Caroline Elkins, *Legacy of Violence: A History of the British Empire* (New York: Alfred A. Knopf, 2022). Defenders of that empire include Niall Ferguson, *Empire: How Britain Made the Modern World* (London, UK: Penguin, 2004).
45. For those warning that digital connectivity is failing to deliver on this promise and include globalization as a “world war,” see William I. Robinson, “Globalization: Nine Theses on our Epoch,” *Race and Class* 38, no. 2 (1996): 13, <https://doi.org/10.1177/030639689603800202>. For globalization as Western or neoliberal and as failing to “redress” “inequalities,” see Stephen Gill, “Globalization, Market Civilization, and Disciplinary Neoliberalism,” *Millennium* 24, no. 3 (Winter): 400, 422–23. See globalization as a “universalization” of cultural forms merely advancing Anglo-American dominance in *Globalization, Democratization, and Multilateralism*, ed. Stephen Gill (New York: St. Martin’s, 1997), 5.